

THE EFFECTIVENESS OF A POSTNATAL PSYCHOEDUCATION  
PROGRAMME ON OUTCOMES OF FIRST-TIME MOTHERS IN  
SINGAPORE

SHEFALY SHOREY

*M.Sc. (Zoology), BSc. (General Science), BSc. (Nursing), Post Graduate Diploma  
(Higher Education), Advanced Diploma (Midwifery), Diploma (Nursing)*

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## DECLARATION

I hereby declare that the thesis is my original work and it has been written by me in its entirety. I have duly acknowledged all the sources of information, which have been used in the thesis.

The thesis has also not been submitted for any degree in any university previously.

---

Shefaly Shorey

1<sup>st</sup> August 2013

## SUPERVISORS

Dr. He Hong-Gu (Main Supervisor)

Professor Chan Wai Chi Sally (Co-Supervisor)

Associate Professor Chong Yap Seng (Clinical Mentor)

## THESIS ADVISORY COMMITTEE

Associate Professor Chan Moon Fai (Chair)

Dr. Su Lin Lin (Member)

Dr. He Hong-Gu (Member)

## PREFACE

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## DEDICATIONS

I would like to dedicate this thesis to my best friend and husband, Depak and my loving son Rohin, for their unconditional love and understanding. I would like to dedicate this piece of work to my two supervisors, Professor Chan Wai Chi Sally and Dr. He Hong-Gu, for their tireless and selfless support. Finally, I would like to dedicate this thesis to my late father Dr. A. P. Sharma. I know wherever he is today, he will be very proud. I am able to submit this thesis due to the unceasing love, support, motivation and trust of these wonderful people who have inspired me to accomplish my dream. I endeavor to practice the knowledge attained by participating in multi-disciplinary research collaborations and sharing with nursing students and colleagues to inform evidence-based quality health care teachings and practices.

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## PUBLICATIONS AND PRESENTATIONS

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### Book

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## ABSTRACT

### Background

The early postpartum period is a stressful transitional period for new mothers, which poses numerous threats to the adaptation to motherhood. This period is further complicated by the lack of support from healthcare professionals due to early hospital discharge. Hence, there is a need for providing continuity of care after hospital discharge for postnatal mothers especially the first-time mothers. Structured psychoeducation programme could facilitate continuity of care and smooth adaptation to motherhood in the early postpartum period.

### Aim

To evaluate the effectiveness of a Postnatal Psychoeducation Programme (PPP) on maternal parental self-efficacy in newborn care, social support and postnatal depression for the first-time mothers in Singapore.

### Methods

The study consisted of two phases. The Phase I aimed at testing the validity and reliability of the Perceived Maternal Parental Self-Efficacy (PMPS-E) scale and the Perinatal Infant Care Social Support (PICSS) scale. These two scales were used together with the Edinburgh Postnatal Depression Scale (EPDS) to measure outcomes in the second phase. The Phase II adopted a randomized controlled pretest-posttests repeated measures design to examine the effects of a PPP on maternal outcomes including maternal parental self-efficacy (MPSE), social support (SS) and postnatal depression (PND).

In phase I, data were collected from both primiparas and multiparas (n=204) during the first to third days postpartum. The validity and reliability of the two instruments were tested. In Phase II, 122 primiparas were recruited (61 intervention and 61 control). The intervention group received PPP and routine care while control group received routine care only. Outcomes were measured at baseline, six weeks postpartum and 12 weeks postpartum. The data were analysed using descriptive and inferential statistics. Eighteen participants from the intervention group were

interviewed for the process evaluation of the PPP at six weeks postpartum. Thematic analysis was used to analyse the interview data.

## Results

The results of the Phase I study indicated PMPS-E and PICSS scales were valid and reliable to be used among mothers in Singapore. Results in the Phase II study revealed significant improvement on MPSE and SS and reduction in PND both at six weeks and 12 weeks postpartum for the intervention group when compared with the control group both unadjusted and after adjusting for demographic variables such as age, employment status and type of birth. The process evaluation interviews supported that the intervention group considered the PPP had enhanced their MPSE and SS and reduced depressive symptoms.

## Conclusion

This is the first study of its kind in Singapore that evaluated an innovative postnatal service using a rigorous research design. This study provided empirical support for the effectiveness and feasibility of PPP in enhancing maternal parental self-efficacy and psychosocial wellbeing of postpartum mothers. The study has the potential benefits of improving postnatal supportive care in Singapore. This study also generates a much-needed impetus and indicates the direction for the development of more women centered maternity-nursing care. It highlights the importance of continuity of care in terms of home visits support for the first-time mothers in Singapore.

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## LIST OF ABBREVIATIONS

ANOVA	Analysis of variance
ANCOVA	Analysis of covariance
CBT	Cognitive Behavioural Therapy
CPF	Central Provident fund
CVI	Content validity index
EPDS	Edinburgh Postnatal Depression Scale
ITT	Intention-to-treat analysis
MMP	Medisave Maternity Package
MPSE	Maternal parental self-efficacy
PND	Postnatal Depression
PPP	Postnatal psychoeducation programme
PMPS-E	Perceived Maternal Parental Self-efficacy
PICSS	Perinatal Infant Care Social Support
SS	Social support

## STATISTICAL SYMBOLS

$\alpha$	Level of significance
$\beta$	Probability associated with Type II error
CI	Confidence interval
df	Degree of freedom
F	Fisher's F ratio
M	Mean
n	Number of a sample
$\eta^2$	Partial eta squared
p	Probability
r	Pearson product-moment correlation coefficient
SD	Standard deviation
SE	Standard error
T	Computed value of t-test
$\chi^2$	Computed value of chi-square test

# CHAPTER 1 INTRODUCTION

## Background

Declining birth rate is an issue of concern internationally where the average global birth rate has reduced from 20.09 per 1,000 total populations in 2007 to 19.15 births per 1,000 total populations in 2009 (Central Intelligence Agency, 2010). Singapore has one of the lowest fertility rates in the world (McDonald, 2006), which has been constantly declining over the past decade from 1.6 per thousand populations in the year 2006 to 1.11 per thousand populations in 2011 (Singapore Department of Statistics, 2011). This ailing fertility rate is epitomized across all the ethnic groups of multi-racial Singapore society such as 1.08 for the Chinese, 1.82 for Malays and 1.14 for Indians (Singapore Department of Statistics, 2011). The reason for declining birth rates, which have been studied globally, may be multi-factorial such as maternal expectations, age, economic status, career and previous negative birth experiences (Halldorsdottir & Karlsdottir, 1996; McDonald, 2006; Ng, 2011). However, studies have found that childbirth experience was one of the main factors affecting birth rate (Waldenstrom & Gottvall, 2002; Waldenstrom, Hildingsson, & Rubertsson, 2004). The early postpartum period is important as the mothers reconstruct their childbirth experience during this period. Lack of support during this period may interfere with their predisposition to get pregnant again (Condea, Figueriedoa, Costaa, Pachecoa, & Paisb, 2008). In Singapore, the limited postnatal supportive care for new mothers could be one of the reasons contributing to low birth rates despite of government's efforts of longer maternity leave and cash incentives for having more than one child (Lim, 2008; Ministry of Manpower, 2013; Yap, 2003). It is essential for health care professionals to provide the necessary physical and emotional support to new mothers in the early postpartum period for their smooth transition to motherhood.

The early postpartum period is a stressful transition period to motherhood where new mothers face with numerous physical and emotional challenges (Bashour et al., 2008; Forster et al., 2008), fatigue, the demanding responsibility of caring for a newborn and the profound changes in roles and responsibilities (Tulman & Fawcett, Nelson, 2003). Primiparas (first-time mothers) feel more stressed than multiparas (with one or

more children) as they do not have previous childbirth experience (Forster et al., 2008; Tarkka, Paunonen & Laippala, 2000). Lack of support from health care professionals and significant others during this period may complicate the issue further. Mothers with low social support were found to have poor maternal adaptation including low maternal parental self-efficacy and depression during the early postpartum period (Horowitz & Damato, 1999; Lee, Yip, Chiu, Leung, & Chung, 2001).

Maternal parental self-efficacy (MPSE) in newborn care is one of the crucial needs for transition to motherhood (Leahy-Warren 2005, Sanders & Wooley 2005, Ngai, Chan, & Ip, 2010). MPSE is the cognitive belief mothers hold in their ability to perform newborn-care tasks (Leahy-Warren 2005). Both national (Ong et al., 2013) and international (Kapp, 1998; Leahy-Warren, 2005) studies have highlighted that first-time mothers have lower MPSE when it comes to various newborn care tasks and that social support could lead to enhanced MPSE (Tarkka, Paunonen, & Laippala 1999; Haslam, Pakenham, & Smith, 2006; Gao, Chan, & Mao, 2008; Ngai, Chan, & Ip, 2009; Ngai & Chan 2010; Leahy-Warren & McCarthy 2010), which is closely linked to child development (Coleman & Karraker, 2000).

Social support can be facilitated by providing education and maintaining the continuity of care by health professionals' postpartum follow-up home visits after the hospital discharge (Bennet & Tandy, 1998; Fenwick, Butt, Dhaliwal, Hauk, & Schmeid, 2010; Ngai et al., 2010). There is a global issue of early postpartum discharge due to resource constraints such as the limited availability of hospital beds and increasing healthcare costs (Bick, et al., 1997; Brown, Davey, & Bruinsma, 2005; Fink, 2011). This early postnatal discharge varies in timing among countries from as early as 12 hours to 48-72 hours depending on the type of delivery (Lof, Svalenius, & Persson, 2006; Zadoroznyj, 2006). Due to the early postnatal discharge, there is a lack of opportunity for health professionals to provide effective education to mothers (Kapp, 1998). This lack of education may cause further disadvantages such as dissatisfaction among the care providers (midwives/nurses) (Kapp, 1998) and consumers (mothers and their families) (Cooke & Stacey, 2003; Fenwick et al., 2010). Midwives feel the pressure of limited time and the need to rush through information leaving little opportunities for return demonstrations on the tasks taught (Kapp, 1998).

Mothers, on the other hand, feel the lack of emotional support and confidence in self and newborn care after being discharged from the hospital (Fenwick et al., 2010; Kapp, 1998). In addition, the feeling of inadequacy, disorganization, confusion and fatigue in the early postpartum period tends to influence new mothers' control over their emotions and behaviours posing a threat of developing postnatal depression (Chan, Levy, Chung, & Lee, 2002).

Postnatal depression has been found to affect 13% of women in a landmark meta-analysis conducted by O'Hara and Swain (1996). The other recent meta-analysis (Gavin et al., 2005) of 28 studies across different countries and cultures showed 19.2% of postnatal depression prevalence rate. In Singapore, 12.2% of new mothers have been reported to suffer from depressive symptoms in the first six weeks postpartum (Chee et al., 2005). With an annual birth rate of approximately 42,600 (Singapore, Department of Statistics, 2012), it is estimated that 5, 200 women suffer from postnatal depression every year, indicative of the need for more rigorous supportive interventions for new mothers.

### Obstetrics Services in Singapore

Singapore is well known for its world-class quality health care service with a maternal mortality rate of 3 per 100,000, being one of the second lowest after Estonia (Central Intelligence Agency, 2010) and the infant mortality rate of 1.8 per 1000 live births, being fourth lowest in the world after Monaco, Japan and Bemuda (Central Intelligence Agency, 2012; Singapore Department of Statistics, 2012). The population in Singapore is over 5 million (Singapore Department of Statistics, 2012) and grew rapidly due to the government's relaxed immigration policies in the year 2010-2011, which saw an influx of migrants from Mainland China and India (Leong & Teo, 2011). The annual live births in Singapore dropped steadily from 19,035 in 2011 to 4,892 in the first quarter of 2012 (Singapore Department of Statistics, 2012), which sparked concerns of declining birth rates amongst policy-makers of the Singapore government.

There are three public hospitals and six private hospitals that offer maternity care from the antenatal to the postnatal period in Singapore (Singapore Motherhood,

2013). The services include routine antenatal checkups, screening and diagnostic tests, intrapartum, postnatal and newborn care. In addition, there are 18 polyclinics evenly spread island-wide, some of which offer maternity care including antenatal care, preparation to childbirth and newborn immunisation. However, this support varies and lacks consistency and structure across institutions (Phang & Koh, 2010).

In Singapore, the model of maternity health care service is mainly obstetrician-led care. Women are cared for by obstetricians in the hospitals or polyclinics during the antenatal period and transferred to hospitals for childbirth (National Healthcare Group Polyclinics, 2012). Mothers can choose to be a private patient or subsidised in the hospital. Private patients can choose a senior consultant obstetrician for their care antenatally, during childbirth and postnatally. Most of the expenses are borne by private patients either out-of their own pocket or via insurance. Subsidised patients receive subsidies from the government to pay for their pregnancy and childbirth related expenses and they are cared for by junior doctors. In either case, the main maternity care providers are the obstetricians who provide care with the support of midwives and nurses, regardless of the risks of pregnancy (Phang, 2009). Childbirths mainly take place in the hospitals, as giving birth at home is not legal in Singapore. The discharge policies vary between hospitals though these are normally early discharges due to the scarcity of hospital beds, increasing costs of healthcare and mothers' personal preference (Ng, 2011). The timing of discharge varies from as early as 12 to 48 hours for normal deliveries and 72 hours for caesarean births. The only type of postnatal care available for the women is during the hospital stay or a follow-up hospital visit with obstetricians, scheduled between one to six weeks post delivery depending on the type of delivery, hospital policies and women's needs. Less attention has been given to them after discharge, in spite of short hospitalisation stays. Aside from providing hotline numbers of the ward and lactation consultants, no formal care is available during the interim between hospital discharge and a postpartum check-up, which is also not well utilised by the subsidised group of women (anecdotal evidence).

Unlike many Western countries (D'Amour, Goulet, Labadie, Bernier, & Pineault, 2003; Gagnon et al., 1997; Fenwick et al., 2010), the follow-up postnatal support in the form of home visits by midwives is not a customary practice in Singapore and it is

also not publically funded. Nevertheless, there is a changing trend in the models of care available for women in Singapore today. Recently, two public hospitals have introduced Midwifery-led Care (where midwives look after the women from antenatal to delivery and then through to the postnatal period) and Enhanced Midwifery Maternity Care (where midwives work in collaboration with the obstetricians to provide antenatal, intra-partum and postnatal care to the women and deliveries are conducted only by doctors) (AsiaOne, 2010; National University Hospital, 2010). However, these initiatives do not provide postnatal support at mothers' homes. Also, as these initiatives are recently established, there is a lack of awareness and confidence among the general public on opting for these types of maternity care (anecdotal evidence from healthcare workers such as midwives/nurses).

### Expenditures for the Perinatal Services in Singapore

The Ministry of Health is responsible for ensuring affordability of healthcare for the public, largely, through a system of compulsory savings, subsidies and price controls in Singapore. The government has put in place a financing framework, which consists of the Medisave, MediShield and Medifund (Central Provident Fund Board, 2012). Medisave is a national saving scheme, which comprises 6-8% of the monthly Central Provident Fund (CPF) savings of an individual. Medishield is an insurance scheme to help individuals pay for the serious illnesses or prolonged periods of hospitalisation. Medifund, on the other hand, is an endowment fund provided by the government for needy Singaporeans who are unable to pay their hospital expenses (Central Provident Fund Board, 2012).

The private healthcare insurance schemes are available for those who can afford the higher expenses. These expenses are borne for accessing private hospitals or senior consultants in public hospitals. For the group of subsidised patients, though they receive a substantial amount of subsidies from the government, there is still some amount that is paid out-of-pocket or through their CPF savings. Singaporeans hence, have the individual responsibility in co-paying their medical expenses. As far as maternity expenses are concerned, the Medisave Maternity Package (MMP) can be used to pay expenses for antenatal consultations and childbirth. However, the MMP does not cover postnatal consultations with the obstetricians (Central Provident Fund

Board, 2012). This could be the reason that these postnatal consultations are not well utilised by the subsidised group of patients (anecdotal evidence). The lack of funding may also be the reason for limited follow-up support available to women in Singapore.

Furthermore, obstetrics packages are introduced in the hospitals for payments on charges incurred due to obstetrics services and to simplify the payment processes (Wong, 2009). These packages include antenatal appointments with the obstetrician and the delivery service. Additional charges are incurred for the use of the delivery suite, hospitalisation, births that are complicated such as instrumental delivery, caesarean section and postnatal consultations. Singapore citizens and permanent residents may gain reimbursements on a portion of these costs from their CPF (Central Provident Fund Board, 2012).

#### Postpartum Support Available For Mothers in Singapore

Traditionally, multi-ethnic groups in Singapore such as the Chinese, Malay and Indian mothers are supported by their family members for advice and assistance in mothering skills as well as for the emotional support. Previous studies (Leahy-Warren, 2005; Teti, & Gelfand, 1991) have also shown that the support from significant others is important in facilitating maternal adaptation to motherhood. Majority of mothers in Singapore follow cultural ‘confinement’ practices or ‘doing the month’ with some modifications that fits their personal routine (Naser et al., 2012; Ong et al., 2013). This ritual is meant to ensure passage of child-rearing knowledge, practical and probably emotional support, which might protect the women against depression in the early postpartum period (Lee, Yip, Leung, & Chung, 2004). However, studies conducted on local women have found that a negative confinement experience is a significant risk factor for postnatal depression and is not universally welcomed by women (Chee et al., 2005). Hence, the confinement practice could no longer be considered generally helpful unless it has been accepted from the mothers’ point of view. Also, this highlights the need of introducing a culturally competent family orientated individualised supportive care for new mothers.



Given that an important part of maternity healthcare service is the postnatal support provided by nurses and midwives to prepare mothers for the changes and demands in motherhood (Beger & Cook, 1998), the support after the hospital discharge is important to enhance maternal parental self-efficacy and reduce depressive symptoms. The postnatal supportive educational programmes delivered at the comfortable home environment of mothers are hence essential and are a priority to facilitate the smooth transition to motherhood (Kapp, 1998; Lock & Gibb, 1998; Ngai et al., 2009).

### A Need of Postnatal Psychoeducational Programmes in Singapore

There are limited psychoeducational programmes available globally during the postnatal period as the focus remains mainly on breastfeeding, childbirth education or for mothers who are depressed (Ngai et al., 2009; Nichols, Schutte, Brown, Dennis, & Price, 2009; Ip, Tang, & Goggins, 2009; Kapp, 1998). However, the support available for low risk mothers in the early postpartum period remains limited. In addition, the support provided in the form of home visits, focuses mainly on instrumental support with baby care tasks or the screening of the baby by the varied support providers including midwives, community health nurses and non-health care professionals such as home care workers (D'Amour et al., 2003; Morrell, Spiby, Stewart, Walters, & Morgan, 2000). There is an inadequate description on the type of interventions being executed during these home visits.

The maternal parental self-efficacy, social support and postnatal depression are three inter-related components that are essential for the smooth transition to motherhood (Leahy-Warren, McCarthy, & Corcoran, 2011a; Ngai et al., 2010). The social support from health care professionals and significant others are believed to enhance maternal parental self-efficacy and reduce depressive symptoms (Cunningham & Zayas, 2002). At present, there is no intervention study that has considered these important inter-related components together to enhance maternal adaptation to motherhood. Most of the available educational programmes lack the support of a theoretical framework. Furthermore, there is a need to develop culturally competent multi-modal interventions such as psychoeducation to affect the multiple maternal outcomes (Cunningham & Zayas, 2002), as there is no such educational programme available in

Singapore. Thus, a postnatal educational programme with a strong theoretical framework is warranted to empower new mothers with confidence and support to manage the complexity of maternal role and the emotional demands of the critical role transition.

The self-efficacy theory (Bandura, 1997) and social exchange theory (Blau, 1964, Homans, 1961) provided a theoretical framework for the development of a postnatal psychoeducation programme in this study. The aim of the study was to develop and evaluate the effectiveness of a Postnatal Psychoeducation Programme (PPP) on first-time mothers' outcomes including maternal parental self-efficacy, social support and postnatal depression in Singapore. The study was conducted in two phases: (1) Phase I aimed to validate the Perceived Maternal Parental Self-efficacy (PMPS-E) scale and Perinatal Infant Care Social Support (PICSS) scale as they are developed and validated on the Caucasian population and had previously never been tested on the Asian population. The validation of these instruments is specifically critical when they are developed and used in culturally different populations (Chang, Chau, & Holroyd, 1999). Hence, the study could facilitate the accumulation of experience on using these instruments across different cultures. (2) Phase II aimed to evaluate the effectiveness of the PPP on the aforementioned maternal outcomes of first-time mothers.

### Significance of the Study

Given the stressful demands of the early postpartum period and its adverse effects on maternal maladaptation to their mothering role, specifically, due to the lack of proper educational and follow-up support, the knowledge on the effectiveness of PPP in promoting maternal parental self-efficacy, social support and postnatal depression is of paramount importance. The results of this study will provide a better understanding of the role of self-efficacy and social exchange theories in enhancing maternal parental self-efficacy and reducing depressive symptoms and the credibility in using these theories as a theoretical framework to develop postnatal psychoeducational programmes for multi-racial mothers in Singapore. This study contributes to the knowledge needed in developing theoretically based psychoeducation programmes to support mothers as they cope with the unique challenges of motherhood. This knowledge may then help to advance perinatal education research in promoting

maternal health and transition to motherhood by meeting their needs in developing confidence as mothers and, in being competent in their maternal role.

If the PPP is effective, it can be used as a routine intervention to improve postnatal supportive care to the mothers in Singapore. The knowledge gained from this study can be used to plan a culturally competent postnatal psychoeducation programme to promote the transition to motherhood. Such interventions will not only promote the quality of maternal life but also healthy functioning of the newborns and the entire family. To the best of the researchers' knowledge, this is the first study of its kind that evaluates innovative postnatal services using a rigorous research design. This study provides empirical support for the effectiveness and feasibility of a PPP in enhancing self-efficacy and psychosocial wellbeing of postpartum women. The programme has the potential benefits of preventing postnatal depression and reducing the associated healthcare and social burdens.

### An Overview of the Thesis

Chapter one has provided a synthesis of the elements that initiated this study. This chapter introduced Singapore's low fertility problem and justified the need for postnatal supportive care for the new mothers, especially the first-time mothers. In addition, background information on current maternity healthcare practices in Singapore was presented. The current literature on postnatal supportive care with special focus on maternal parental self-efficacy, social support and postnatal depression is reviewed in Chapter two. The interventions available to provide support for the new mothers are explored in depth. Chapter three provides details on the validation of two instruments (Perceived Maternal Parental Self-Efficacy Scale and Perinatal Infant Care Social Support Scale), which have not been used in local context previously. The chapter explained the methodology and results obtained in testing the validity and reliability of the instruments. Chapter four provides justification for the study design, an overview of the research methods and processes, as well as discussion on the rigor and ethical issues of the study. Chapter five presents the results of the study including both the quantitative and qualitative process evaluation interviews findings. Chapter six discusses the results in comparison to contemporary literature and provides recommendations for future research and practice. Chapter seven concludes the study.

## CHAPTER 2 LITERATURE REVIEW

### Introduction

This chapter provides a discussion on the existing literature regarding self-efficacy, social support and postnatal depression in the early postnatal period. The literature review begins with an overview of the postnatal period and the challenges mothers face during this period. Postnatal depression, self-efficacy and social support among mothers will then be introduced with relevant study findings compared and discussed. The relationships among self-efficacy, social support and postnatal depression will also be highlighted. Thereafter, the gaps in the literature will be generated. The theoretical framework developed from the review of literature will be presented to support the current study. A summary of this chapter will be presented at the end.

### Search Strategies

The electronic databases including CINAHL, PubMed, PsycINFO, ScienceDirect, the Joanna Briggs Institute, the Cochrane library and Google scholar were used to search the relevant literature. The search included published literature in English from January 1990 to January 2013. Initial keywords searched were ‘postnatal/partum support’, ‘postnatal/partum home visits’, ‘midwives home visits’, ‘social support’, ‘postnatal depression’, ‘self-efficacy’, ‘maternal self-efficacy’, ‘correlation/relationship’ and ‘health education interventions’. Different combinations of keywords were used with a total of 220 articles retrieved and reviewed. Both qualitative and quantitative studies were included. The reference lists of included studies were also explored to identify relevant literature.

### Postnatal Period

The postnatal period is defined as the time from birth until a woman’s body returns to its pre-pregnant stage (Ladewig, London, Moberly & Olds, 2002) and it usually lasts for six to eight weeks. This time period is somewhat arbitrary due to the lack of evidence on why six to eight weeks was selected;

however, it is a crucial period during which mothers are expected to have recovered both physically and psychologically from pregnancy and birth (Bick, Bastos & Diniz, 2008). This period is critical for the health and survival of newborns and mothers. Lack of care during this period could result in dissatisfaction for mothers and their families as well as missed opportunities to promote healthy behaviours affecting mothers, newborns, and their families (Brown et al., 2005; Mckellar, Pincombe, & Henderson, 2006; Wilyman-Bugter & Tucker, 2004). Many mothers feel unprepared for the realities of early postpartum due to lack of adequate education during the short stay in the hospital (Graffy & Taylor, 2001; Razurel et al., 2011). This necessitates the need of providing adequate support to new mothers and their families during this crucial period. One of the best ways of providing care to mothers is to hear from them and their families on the type of care they wish for and their satisfaction with the care being provided to them (Brown et al., 2005; Mckellar et al., 2006). This will enable health care professionals to plan and provide support to new mothers according to their individual needs.

### Maternal Challenges in Postnatal Period

During the stressful postnatal period, mothers often face numerous physical and emotional challenges (Bashour, et al., 2008; Forster et al, 2008) and first-time mothers feel more stressed than multiparas due to a lack of prior newborn care experience (Forster et al., 2008; Tarkka et al., 2000).

Physical concerns such as tiredness and fatigue are the common problems experienced by first-time mothers during the early postnatal period (Bailey, 2010; George, 2005; Kouba, 2007; McVeigh, 1999). It is commonly associated with sleep deprivation from newborn care tasks such as nocturnal feeding and the mothers often feel less prepared for that (Kennedy, Gardiner, Gay & Lee, 2007). Other physical challenges include painful breastfeeding experiences (Bennett & Tandy, 1998; Razurel, Bruchon-Schweitzer, Dupanloup, Irion, & Epiney, 2011) generalized pain, soreness and discomfort (Kouba, 2007).

Many studies have explored mothers' experiences and challenges they face during the postnatal period (Kanotra et al, 2007; Leahy-Warren, 2005; Lof et al., 2006; Martell, 2001, Ong et al., 2013). These studies confirmed that transition to motherhood is an overriding concern for new mothers, especially, for their infants and the need to develop adequate skills and confidence in mothering abilities. Kanotra et al. (2007) collected qualitative data from voluntary comments made by mothers from the United States (US) (n= 324) on the risk assessment forms after the hospital discharge. They concluded that early experience of motherhood among new mothers was considered stressful. The findings underlined the maternal needs, especially, education about newborn care and understanding of postnatal depression after the hospital discharge. The enhanced social support for new mothers between two weeks to nine months post delivery was also highlighted. Another study conducted on 32 first time mothers in the US (Martell, 2001) confirmed that the mothers were not confident of their ability to care for their infants at the point of discharge from the hospital. They expressed anxiety and fear about the survival and safety of their babies during first week post discharge. However, the sample size of Martell's (2001) study was small.

The early postnatal period is considered a vulnerable time for Irish mothers as well (Leahy-Warren, 2005). The 135 first-time mothers reported that they were simultaneously confronted with the demands of caring for their baby and the physical, emotional and social changes that ensue after delivery (Leahy-Warren, 2005). Qualitative interviews on nine first-time mothers in Sweden suggested the need of having follow-up support for mothers, especially after the early hospital discharge (Lof et al., 2006).

Many other studies supported the notion that first-time mothers felt unprepared and lack of confidence in being able to take care of their babies, especially after the early postnatal discharge from the hospital (Forster, et al. 2008; Osman, Chaaya, El Zein, Naassan & Wick, 2010; Wilkins, 2006). Forster et al. (2008) conducted focused group interviews with 52 Australian women comprising pregnant and postnatal primiparas and multiparas. Their findings suggested that mothers, especially the primiparas were anxious and

fearful about their new role as mothers and expressed lack of confidence in being able to look after their newborns without professional support.

Osman et al. (2010) highlighted that the first four weeks were the most stressful periods for new Lebanese mothers (n=353) post delivery. They examined the questions received by the midwives during the phone calls after the hospital discharge. They found that about 60% of first-time mothers were concerned and sought support regarding routine newborn care tasks such as feeding and sleeping issues. However, collecting data retrospectively from questionnaires could imply missing out on some pertinent information. A qualitative study on eight British first-time mothers further emphasised that the first 4-6 weeks post delivery was a stressful transitional period for mothers where their main concerns were to develop confidence and skills to provide optimal care to their newborns (Wilkins, 2006).

A local qualitative study (Ong et al., 2013) on 13 first-time mothers highlighted that mothers faced numerous challenges such as negative emotions, breastfeeding concerns and fatigue in the early postpartum period. Though the mothers received adequate support from significant others, the support from health care professionals was lacking. Mothers verbalised the need for more information from health care professionals, access to health care services and continuity of care after the early discharge from the hospital.

Overall, by not having to limit to geographical boundaries, the early postnatal period is a stressful transition period for new mothers where mothers face numerous physical and emotional challenges. Specifically, they feel unprepared in looking after their newborns after the early hospital discharge. Both the qualitative interviews (Forster et al., 2008; Lof et al., 2006; Ong et al., 2013; Wilkins, 2006) and the quantitative surveys (Kanoira et al., Leahy-Warren, 2005; Martell et al., 2001; Osman et al., 2010) have highlighted the lack of continuity of support for new mothers which has left them feeling anxious and emotionally distressed in the early postpartum period.

## Early Hospital Discharge

The length of hospital stay in the postnatal period has been reducing globally due to resource constraints including scarcity of hospital beds and the increasing healthcare costs (Bick, et al., 1997; Brown & Lumley, 1997; D'Amour et al., 2003; Fink, 2011; Lof et al., 2006). This resulting early postnatal discharge varies among countries from as early as 12 hours to 48-72 hours depending on the type of delivery and maternal condition (Lof, et al., 2006; Zadoroznyj, 2006). Due to the early postnatal discharge, there is a lack of opportunity for midwives and nurses to provide effective education to mothers (Kapp, 1998). This lack of education may cause further disadvantages such as dissatisfaction among health care providers (midwives/nurses) (Kapp, 1998) and consumers (mothers and their families) (Cooke & Stacey, 2003; Fenwick et al., 2010). Midwives feel the pressure of rushing through the delivery of information to new mothers leaving little opportunities for mothers to perform return demonstrations on skills they have learned (Kapp, 1998). Mothers, on the other hand, feel the lack of emotional support and confidence in newborn care tasks especially after early hospital discharge (Fenwick et al., 2010; Kapp, 1998). These negative consequences then necessitate the follow-up care required for women and their newborns after the hospital discharge.

A quantitative survey on 1616 Australian mothers at 5-6 months postpartum revealed that mothers were not given adequate advice about going home with the baby on various newborn care tasks such as baby feeding (Brown et al., 2005). The mothers felt being rushed and not knowing their midwives well during the short hospital stay. However, there might be a recall bias as mothers were providing feedback retrospectively about their hospital stay experience.

Tarkka and Paunonen (1996) examined the support received and the overall experience of both primiparas and multiparas during the hospital stay via surveys collected at two weeks postpartum from 166 Finnish mothers. Both primiparas and multiparas hoped to have received more guidance on newborn care tasks and breastfeeding. They also felt the lack of emotional support from



the midwives necessitating the need for midwives to be more empathetic towards their emotional needs.

Echoing with Tarkka and Paunonen (1996), Fenwick et al. (2010) highlighted that both primiparas and multiparas received inadequate emotional support from the midwives in Australia. The data were collected at eight weeks postpartum from 2,669 mothers. The mothers also highlighted the lack of adequate information on maternal health. Another study (McKellar et al., 2006) on 85 couples in Australia highlighted the need of family centered support to be provided to new mothers so that both the mother and family benefited in the early postpartum.

In contrast to the above-mentioned studies, Brown, Bruinsma, Darcy, Small and Lumley (2004) in their longitudinal review highlighted that early postnatal discharge had no negative effects on the well-being of new mothers. However, the review did not represent single, low-income mothers and did not consider the re-admissions of infants in hospital hence the results have to be viewed with caution. Also, many mothers were dissatisfied with the care received in the hospital, which could be the reason of preferred early discharge from the hospital.

Another study conducted by Brown et al. (2005) in the same year highlighted that out of all types of maternity care services provided, postnatal care was the most neglected. In line with them, Bick (2003) showed that there was a lack of recognition for postnatal care provided to mothers globally. The main focus of maternity care remained pregnancy and childbirth. Bick (2003) recommended that effective, timely and appropriate postnatal care was the need and right of every mother.

Most previous studies on this topic have been conducted on the Western population and hence the generalisability among Asian mothers might be limited. The few studies among Asian mothers (Chan et al., 2002; Ong et al., 2013) have found similar results that mothers had unmet needs due to the early postpartum discharge. The qualitative study design was used in both studies

with Chan et al. (2002) having interviewed 32 Chinese mothers in Hong Kong and Ong et al. (2013) having interviewed 13 multi-racial (Chinese, Indian, Malays, Caucasian and others) mothers in Singapore. Mothers felt lack of confidence, loss of control and being helpless in performing various newborn care tasks after the early postpartum discharge (Chan et al., 2002; Ong et al., 2013). They wished to have follow-up postpartum home visits support to enable their adaptation to early motherhood (Ong et al., 2013).

In summary, the postnatal period is a stressful transition period that poses various physical and emotional challenges, especially for first-time mothers. The early hospital discharge, which is a global issue, complicates the issue further. However, it is difficult to increase the number of days mothers stay in the hospital due to resource constraints, increasing demands and up-scaling of costs in the healthcare system (Bick et al., 1997; Brown & Lumley, 1997). Hence, various ways of supporting mothers during the early postpartum period should be considered (Brown et al., 2005; Fenwick et al., 2010) to enhance maternal parental self-efficacy in newborn care and social support and to reduce their postnatal depression.

### Postnatal Depression

Becoming a mother is a significant developmental transition and the adaptation to motherhood depends on her bio-psychosocial being, family and the society she lives in (Kiehl & White, 2003). Disadvantages of any of these components puts her at higher risks of developing depressive disorders (Eberhard-Gran, Eskild, Tambs, Samuelsen, & Opjordsmoen, 2002; Gavin et al., 2005). These disorders vary from postpartum blue, postpartum depression to puerperal psychosis (Dennis & Creedy, 2009; Miller, 2002; Nonacs & Cohen, 1998).

Postpartum blue is the most common depressive disorder affecting 50% to 80% of mothers at day three to four postpartum, which is self-limiting and seldom lasts for two weeks (Dennis & Creedy, 2009). In contrast, puerperal psychosis is relatively rare affecting 1% of mothers and involves delusions

and hallucinations. The onset of puerperal psychosis is around two weeks post delivery (Nonacs & Cohen, 1998). Due to the self-limiting nature of postpartum blue and relative rarity of puerperal psychosis, the main focus of health care professionals is on postnatal depression, which is relatively common and more insidious on the onset (Beck, 2008; Dennis & Creedy, 2009).

Postnatal depression refers to the non-psychotic depressive disorder that begins at any time of the perinatal period (defined as pregnancy through the child's first birthday) and/or extends into the postpartum period (Cox, Murray, & Chapman, 1993; O'Hara, 1996). The Diagnostic and Statistical Manual 4<sup>th</sup> Addition (DSM-IV) specifies that clinical diagnosis of postpartum depression require, in addition to the dysphoric mood, the presence of depressive symptoms such as sleep disturbances, fatigue, loss of appetite and suicidal thoughts sustained for at least two weeks among new mothers (American Psychiatric Association, 2000). Although many mothers do suffer from many of these symptoms, only a small proportion of these women meet the DSM-IV criteria for depression (Howell, Mora, DiBonaventura, & Leventhal, 2009). According to previous large-scale studies (Dennis, 2010; Kroenke, Spitzer, & Williams 2001; McLearn, Minkovitz, Strobino, Marks & Hou, 2006), the negative consequences of postnatal depression hold for a large proportion of mothers, regardless if these symptoms reach the level of a diagnosed, major depressive disorder (DSM-IV criteria). The most critical period to detect postnatal depression is from as early as two weeks postpartum to six months postpartum (Josefsson, Berg, Nordin, & Sydsjo, 2001).

### Prevalence of Postnatal Depression

Prevalence of postnatal depression varied internationally from as low as 5% to more than 25% of mothers in the first year postpartum (Beck & Gable, 2000; Chan & Levy, 2004; Dennis & Creedy, 2009, Gaynes et al., 2005; Lee et al., 2001). The chances of developing postnatal depression was higher, especially 2-6 weeks after giving birth though, it could occur anytime within a year postpartum (Chan & Levy, 2004; Gao, Chan, Li, Chen, & Hao, 2010).

According to a meta-analysis on 59 studies by O'Hara and Swain (1996), the postnatal depression prevalence rate was 13%. The differences in the prevalence rate of postnatal depression might be due to varied definitions, measurement instruments used, geographical area from where the samples are procured and the timing of assessment across studies. O'Hara and Swain (1996) found that self-report measures for a longer period of assessment predict a higher prevalence rate as compared to interview based methods. Mothers with postnatal depression were twice as likely to experience future episodes of postnatal depression over a period of five years (O'Hara & Swain, 1996).

Postnatal depression not only affected the mothers of Western origin but also existed across diverse cultures (Affonso, De, Horowitz, & Mayberry, 2002; Chee et al., 2005; Gavin et al., 2005; Lee et al., 2001; Wan et al., 2009). Gavin et al. (2005) in their meta-analysis of 28 studies reported that postnatal depression affects 19.2% of multi-racial mothers of different ethnicities such as Caucasians, Hispanics, Chinese and Japanese especially, during the first three months postpartum. Affonso et al. (2002) examined 892 mothers from nine countries including Australia, Finland, Guyana, Korea, India, Italy, Sweden, Taiwan and the United States and found that the mothers from Taiwan had the highest percentage (60.8%) of postnatal depression score. Another study in Taiwan (Chen, Kuo, Chou, & Chen, 2007) confirmed that an astonishingly high 42.6% of Taiwanese mothers were experiencing postnatal depression.

In Mainland China (Wan et al., 2009), the prevalence of postnatal depression was 15.5% at six-eight weeks postpartum and in Hong Kong (Lee et al., 2001); it was 13.5 % within the first three months postpartum. A prospective cohort study on multi-racial Singaporean mothers (Chee et al., 2005) found that 6.8% of postnatal mothers were suffering from postnatal depression and 12.2 % of mothers were exhibiting some postnatal depression symptoms. Hence, postnatal depression is a universal issue that needs urgent attention of health care professionals so that further individual, family and social burdens can be reduced due to its ill effects.

## Consequences of Postnatal Depression

The consequences of postnatal depression can be devastating not only for mothers but also for their newborns and the entire family (Beck, 1998; Miller & LaRusso, 2010; Murray & Cooper, 1997; Zelkowitz & Milet, 1996). Postnatal depression adversely affects maternal functioning such as breastfeeding, bringing their babies for pediatric visits, implementing infant safety practices (Logsdon, Wisner, & Pinto-Foltz, 2006; Tarkka, 2003) and the mother-infant relationship (Leahy-Warren, McCarthy & Corcoran, 2011b; Miller & LaRusso, 2011; Righetti-Veltema, Conne-Perreard, Bousquet, & Manzano, 2002). Adverse effects of maternal postnatal depression on infants, including emotion regulation, stress reactivity, cognition and social interaction difficulties, are long term and are apparent during infancy, persisting through adolescence (Beck, 1998; Eckenrode et al., 2010; Hayes, 2010; Miller & LaRusso, 2011).

In severe cases, postnatal depression may lead to life crisis such as maternal suicide and infanticide (Beck, 1998; Miller 2002; Shadigian & Bauer, 2005). Hence, any delay in assessing the postnatal depression will lead to delays in diagnosis, treatment and intervention and as such can affect the cognitive development and secure attachment of the infant, the ongoing emotional and mental health of the mother and the wider family (Beck, 1998).

## Etiology of Postnatal Depression

The etiology of postnatal depression is not fully understood. Many factors such as biological, psychological, social and cultural beliefs influence postnatal depression. Some of these factors that were found to correlate with increased risks of developing postnatal depression, include hormonal changes, depressed mood during pregnancy, stressors, insufficient social support, nutritional deficits, low self-efficacy in self and newborn care as well as the physical symptoms (Beck, 2001; Boyce & Hickey, 2005; Davey, Tough, Adair, & Benzies, 2011; Dennis, & Ross, 2006; Howell et al., 2009; Leahy-

Warren et al., 2011b; Miller & LaRusso, 2011). Influence of biological factors such as hormonal changes on postnatal depression was found to be inconclusive (McCoy, Beal & Watson, 2003; Patel et al., 2012). Psychosocial factors such as social support, stressors and self-efficacy, however, were found to have far more impact on the development of postnatal depression than the biological factors (Boyce & Hickey, 2005; Howell et al., 2009; Davey et al., 2011).

Beck (2001) performed a meta-analysis of 84 studies and found that among various factors, antenatal depression, maternal self-esteem, lack of social support and marital relationships were the main predictors of postnatal depression. Some of the additional predictors, which were never explored before and had an association with postnatal depression, were socio-economic status, marital status and unplanned/unwanted pregnancy. All the studies included in the review were quantitative with varied quality and some with insufficient power due to small sample size. The diverse data collection points among these studies further make the comparisons difficult.

Boyce and Hickey (2005) assessed 425 Australian mothers (both primiparas and multiparas) from as early as two days postpartum to various time points such as 6, 12 and 24 weeks postpartum. The psychosocial risk factors such as lack of social support and vulnerable personality (e.g. high neuroticism, negative cognitive attribution style and low self esteem) were mainly associated with postnatal depression. It was also highlighted that both the emotional and instrumental support from the husbands were important for new mothers. However, convenience samples of Caucasian mothers were recruited in the study with different target groups such as both primiparas and multiparas (Boyce & Hickey, 2005) limiting the generalisability.

Howell et al. (2009) and Davey et al. (2011) examined the risk factors of postnatal depression among American and Canadian mothers respectively. The telephone survey on 720 American primiparas and multiparas at two and six weeks postpartum revealed that maternal physical symptoms such as pain, infant colic, lack of social support and lower self-efficacy were associated

with early postnatal depression symptoms (Howell et al., 2009). Similarly, data from 1,403 Canadian primiparas and multiparas uncovered that low social support and low self-efficacy were associated with postnatal depression at eight weeks postpartum (Davey et al., 2011). Additionally, Davey et al.'s (2011) study found that a history of depression and being immigrant in a country was also linked to higher incidences of postnatal depression. These studies used various instruments such as the Edinburgh Postnatal Depression Scale (EPDS) (Davey et al., 2011) and the authors then formulated questionnaires (Howell et al., 2009) to screen for postnatal depression. High attrition rates of more than 25% were the issue with both these studies.

The issue of being a migrant in a country and its relationship to mental health was also highlighted among immigrants in America (Yeoun, 2003) and Australia (Nahas, Hillege & Amasheh, 1999, Ward, 2003). The studies highlighted that the mothers missed the close support of family networks and concluded that regardless of origin, all migrant mothers require a social support network to thrive. The absence of such support not only hindered their adaptation to motherhood but also made them prone to having postnatal depression. Similar findings were found by Huang and Mathers' (2008) study on South Asian migrant mothers in Taiwan which identified the challenges arising from their newly formed family relationships.

Among Asian mothers, the psychosocial factors typically, the lack of support from the husbands and the highly dominating mothers-in-law were the main predictors of postnatal depression (Chan et al., 2002; Chee et al., 2005; Heh, Coombes, & Bartlett, 2004; Rodrigues, Patel, Jaswal, & De Souza, 2003; Wan et al., 2009). Chan et al. (2002), in their qualitative phenomenological study on 35 Hong Kong Chinese mothers found that mothers were feeling entrapped in their new role of motherhood and were unhappy due to their non-caring husbands and interference by mothers-in-law. Another qualitative research among 39 Indian mothers from the state of Goa/Maharashtra (Rodrigues et al., 2003) found that low involvement of baby's fathers in newborn care was the major cause of stress for new mothers.

Chee et al. (2005) interviewed Singaporean mothers at six weeks postpartum and found that traditional practices such as negative confinement experiences especially for those mothers who do not believe in confinement could be a significant risk factor for postnatal depression. However, the study had a very high attrition rate of more than 50%.

A study done on 342 Mainland Chinese mothers (Wan et al., 2009) at six to eight weeks postpartum confirmed that new mothers cared by strict and dominating mothers'-in-law during the confinement period were more distressed emotionally. In addition, there were new mothers who perceived that confinement was un-helpful had twice the odds of having postnatal depression. The survey conducted on 186 Taiwanese mothers at four weeks postpartum (Heh et al., 2004) also concluded that unwanted emotional support from mothers'- in-law during confinement was linked to higher risks of postnatal depression.

In summary, the available evidence on postnatal depression signifies the need for health care professionals, particularly nurses and midwives to be vigilant of those factors that increase the risks of developing postnatal depression and making mothers aware of them. It is crucial to assess mothers' psychological state using appropriate instruments and the use of effective interventions on mothers' especially first-time mothers, in the early postpartum to prevent postnatal depression.

### Measurement of Postnatal Depression

There has been increasing evidence on the importance of early and accurate detection and treatment of postnatal depression (Boyce & Hickey, 2005; Howell et al., 2009; Patel et al., 2012). It has been proposed to perform the screening early as the chances of developing postnatal depression is higher especially during the first two to six weeks postpartum (Boyce & Hickey, 2005; Chee et al., 2005; Gao et al., 2010; Patel et al., 2012). Boyce and Hickey (2005) even found that mothers were showing depressive symptoms as early as two days post delivery especially those who had an early hospital



discharge. Many instruments have been tried and tested to screen mothers for potential postnatal depression (Sheeder, Kabir, & Stafford, 2009). However, some of these instruments such as Beck Inventory Index (BDI) and General Health Questionnaire (GHQ) are not specifically designed to measure postnatal depression as they measure general symptoms of depression and distress (Zubaran, Schumacher, Roxo & Foresti, 2010). The most commonly and widely tested screening tool for postnatal depression is the Edinburgh Postnatal Depression Scale (EPDS) (Cox, Holden & Sagovsky, 1987). It is a 10-item questionnaire with high sensitivity of 86% and specificity 78%, including a question on suicidal ideation screen (Cox et al., 1987). It has been widely tested across various languages and cultures and a cut-off positive screen for postnatal depression on EPDS is > 13 (out of possible 30) (Gibson, McKenzie-McHarg, Shakespeare, Price, & Grey, 2009).

### Interventions to Prevent Postnatal Depression

Since the risk factors of postnatal depression are multi-factorial, the interventions to combat postnatal depression should be multi-modal (Cunningham & Zayas, 2002; Miller & LaRusso, 2011; Priest, Austin, Barnett, & Buist, 2008). The interventions act cumulatively against the various risk factors rather than individually, are more likely to be successful. It is important to assess the risk factors such as social support, self-efficacy, stress, eating and sleeping patterns of new mothers and then plan interventions depending on the factors that need strengthening (Cunningham & Zayas, 2002; Miller & LaRusso, 2011). However, many mothers are often reluctant to admit that they are experiencing postnatal depression due to ignorance or social stigma (Lau & Wong, 2008; McIntosh, 1992). Especially among Hong Kong Chinese (Lau & Wong, 2008) and Mainland Chinese (Gao et al., 2010) mothers, postnatal depression was considered a taboo and shame for the entire family. Some mothers also feel uncomfortable discussing about their emotional difficulties as they felt it might be used against them in some way (McIntosh, 1992). Thus, screening or discussions on postnatal depression has to be culturally sensitive and needs to take account mothers' own perceptions and explanations of their problems.

Many researchers developed and tested a variety of interventions to prevent postnatal depression (Gunn, Lumley, Chondros, & Young, 1998; Leis, Mendelson, Tendon & Perry, 2009; Lumley, Austin, & Mitchell, 2004; McArthur et al., 2002); and others did systematic reviews (Alderdice, McNeill, & Lynn, 2012; Cunningham & Zayas, 2002; Dennis, 2005; Fisher, Wynter, & Rowe, 2010; Shaw, Levitt, Wong, & Kaczorowski, 2006) however, the findings were inconclusive. Alderdice et al. (2012) performed a systematic review of 32 systematic reviews to identify the non-invasive interventions to improve maternal mental health. Based on the 32 systematic reviews, the authors identified various interventions such as psychological and psychosocial interventions, parent education and training programmes especially by midwives to be worthy of further research. They highlighted the need of high quality randomised controlled trials to plan a strategic approach to promote mental health. They also emphasised that before proposing any intervention, it is important to consider the realism, practicality and feasibility of the interventions. The significance of support provided by midwives in maternal mental health was discussed and midwives were identified as the key health care professionals who played a pivotal role in promoting maternal mental health. Less than half of the 32 reviews were meta-analysis and many included studies with poor design and quality with poor compliance rate and varied population of mothers were examined, which limited the generalisability of the review (Alderdice et al., 2012).

A review of literature conducted by Cunningham and Zayas (2002) on methods of reducing depression in pregnancy found that combining various psychosocial interventions such as cognitive behavioural interventions, social support and psychoeducation on various newborn care tasks were more effective than any single approach. In the review, they found evidence supporting that joining various interventions tends to offer multiple treatments for multiple problems. The cognitive behavioural and psychosocial interventions included interpersonal psychotherapy and cognitive-behavioural therapy (CBT) focused on tackling dysfunctional thinking in depression by challenging unrealistic beliefs and improving problem solving skills (Cunningham & Zayas, 2002). They recommended that social support from

both professionals and family members was important. They also emphasised the importance of home visits to enhance family functioning and mental health (Cunningham & Zayas, 2002). When providing social support during home visits, the focus remained on building new network ties, maintaining and strengthening existing ties and enhancing family ties during pregnancy. Current evidence maintains that social support could prevent depression by enhancing maternal parental self-efficacy. They highlighted that psychoeducation programmes on newborn care would promote maternal attitudes, sensitivity and responsiveness and thus better interactions with their newborns (Cunningham & Zayas, 2002). Lastly, the authors highlighted that multimodal interventions would be a success only if healthcare professionals consider the culturally competent practice to support pregnant mothers. However, there was no information on the quality and types of studies included and excluded from the review. The number of studies included, keywords used and search engines reviewed were not mentioned, which limited the validity of the review. Nevertheless, the review highlighted the need of planning and testing multi-modal interventions to reduce depression during pregnancy and early postpartum (Cunningham & Zayas, 2002).

In line with Cunningham and Zayas (2002), many other researchers (Chabrol et al., 2002; Dimidjian & Davis, 2009; Gao et al., 2010; Lau & Wong, 2008) recommended the use of psychosocial or psychological interventions to prevent postnatal depression during the antenatal period on varied populations such as Western and Asian women. In contrast to these studies, the systematic review on the effects of psychosocial and psychological interventions to prevent postnatal depression highlighted that these interventions did not significantly prevent postnatal depression unless the interventions were introduced in the postnatal period (Dennis, 2005). Fifteen trials were included in the meta-analysis incorporating 7,697 mothers and stressed that individual based culturally inclined interventions were more effective than group based interventions. Some of the trials in the review (Dennis, 2005) had poor compliance rate and information on the standardisation of the intervention protocol was not available. Dennis (2005) recommended that by overcoming

methodological flaws and planning individualised culturally appropriate interventions in the postnatal period could prevent postnatal depression.

A systematic review of randomised controlled trials on home-based psychological interventions to prevent and treat postnatal depression incorporated six studies including 1,151 women (Leis et al., 2009). Most of the studies reported statistically significant treatment effects on postnatal depression following the interventions. The interventions in the review were referred to an array of structured approaches encompassing psychological methods such as CBT and interpersonal psychotherapy. The researchers also recommended that, in addition to increasing the home-based interventions, there were four focus areas critical for advancing future research. These included: (1) home based interventions should be guided by a theoretical framework based on mediators and moderators of preventing postnatal depression; (2) interventions should be focused on prevention of postnatal depression rather than treating postnatal depression; (3) interventions should incorporate diverse groups of the population such as those with low and high risks for postnatal depression, ethnic diversity and diverse socio-economic states; and (4) the methods of reporting findings should be standardised so that interventions can be replicated and tested for their reliability and validity on diverse populations (Leis et al., 2009).

There were marked differences across the studies incorporated in the review (Leis et al., 2009) in terms of interventions content and duration (from five weeks to one year most lasting six to eight weeks), intervention providers, measures to screen depression, assessment time frames and study samples. These pose challenges for comparing findings across studies. Also, there were methodological limitations among the studies reviewed including high attrition rate, failure to report intent-to-treat analysis and mothers taking antidepressants that might have limited the actual effects of interventions (Leis et al., 2009). The study sites in the reviewed studies (Leis et al., 2009) were in Europe such as England, France, Scotland and Sweden further limiting the generalisability to Asian mothers. In spite of these limitations, the review has

provided recommendations for future studies to reduce the burden of postnatal depression among mothers and their families.

Aligned with Leis et al.'s (2009) review, a qualitative evaluation of questionnaire responses of 111 depressed mothers also highlighted the importance of home based interventions in the early postpartum (Rossiter, Fowler, McMohan, & Kowalenko 2012). Child and family health nurses conducted 10 visits to mothers with moderate to severe depression from the period when the infant was four to six months to one year old. The focus of the intervention was a discussion on a video recording of the interaction between a mother and an infant. Additionally, supportive counseling, problem solving and education on infant care and development were provided. Mothers valued the home visit interventions for its capacity in enhancing their confidence and bonding with their infants. They attributed the success of the programme to the positive relationship with the care provider and the reassurance they experienced on receiving the support in their convenient home environment. They verbalised the need of an information booklet to reinforce the contents learned from the nurses. The limitation of the study included the low response rate of 50.7% that limited the generalisability of the study (Rossiter et al., 2012).

The large cluster randomised trial conducted by McArthur et al. (2002) has demonstrated significantly lower level depressive symptoms when compared to the control group at four months after birth. The sample size was big (37 General Practitioner clusters), with 1087 women randomised to intervention and 977 to control group. However, the validity of the results was questionable due to the potential for allocation bias in random distribution of clusters. Similarly, Lavender and Walkinshaw (1998) in their randomised controlled trial on 120 British primiparas found that mothers who received postnatal debriefing immediately after delivery from midwives in the form of listening, counseling and explanation tend to have low anxiety and depression. However, the data was collected using the Hospital Anxiety and Depression Scale (HADS), which is not validated to be used specifically in the puerperium as opposed to EPDS, hence, limited the validity of results. Also,

there was an apparent selection bias as 60% of the participants were single women with high rates of self-reported depression.

Several other studies (Gunn et al., 1998; Priest et al., 2003; Lumley et al., 2004; Morrell et al., 2000; Reid et al., 2002) found that interventions to reduce postnatal depression were not effective. Gunn et al. (1998) used earlier than usual postnatal visit (2 weeks) to a primary care physician. Priest et al. (2003) used the childbirth experience debriefing with the psychologist. Lumley et al. (2004) involved community-based interventions by increasing the skills of primary health care nurses to identify women with mental health problems and make appropriate referrals. Morrell et al. (2000) involved practical assistance and emotional care from a non-health care professional trained support worker. Reid et al. (2002) provided specific information pack containing information on newborn sleep and management of a crying baby. These interventions used in the studies focused mainly on depressed mothers with the aim of reducing postnatal depression. These interventions used to reduce depression did not target the modifiable risk factors such as lack of social support directly. Also, the various psychosocial interventions used (Priest et al., 2003) such as CBT and interpersonal therapy require experienced psychological expertise in their delivery and need additional training for the midwives that may not be feasible in many clinical situations. Furthermore, both CBT and interpersonal therapy focused on pathogenic model of diagnosing and treating postnatal depression. However, evidence (Miller & LaRusso, 2011; Patel et al., 2012) has shown that there were multiple factors correlated with the increased risks of developing postnatal depression. Hence, there is a need to develop multi-modal clinically effective, feasible and acceptable universal strategies that focus on preventing postnatal depression.

Though all the studies were adequately powered, analysed by intention-to-treat analysis and had properly concealed random allocation to trial arms, there were some methodological limitations such as the attrition rate which was more than 20% at final trial (Gunn et al., 1998; McArthur et al., 2002; Morrell et al., 2000; Reid et al., 2002). There was also a poor compliance with the intervention in Reid et al.'s study (2002).

Fisher et al. (2010) developed a multi-modal psychoeducational intervention that focused on addressing multiple modifiable risk factors to prevent postnatal depression among Australian mothers. The psychoeducational intervention was delivered by maternal and child health nurses to 609 couples at four weeks postpartum. A total of 399 families were allocated in the intervention group and the other 210 families were in the control group who received the standard care. The main focus of the intervention was on more readily modifiable risk factors such as low social support, quality of the relationship with the intimate partner and knowledge about infant care. The researchers highlighted the importance of both professional and family support. The study supported that psychoeducation that provided knowledge, support and coping mechanism was more effective than merely offering support.

Lincoln, Wilhelm and Nestoriuc (2008) further highlighted that psychoeducation was an intervention mainly focusing on providing knowledge relevant to a health condition and its treatment, in addition to promoting increased coping or behavioural adjustment. The components of psychoeducation may include prevalence of health related issues, health risks and negative consequences, benefits of change and implications for improvements (Lincoln, Wilhelm, & Nestoriuc, 2008). As such in Fisher et al.'s (2010) study, psychoeducation focused on communicating comprehensibly about modifiable risk factors related to postnatal depression and supporting the development of a set of well-operationalised skills to bring about behavioural change. However, there was a risk of potential selection bias in the study, as the couples were not randomised to control and intervention groups. This underlined the need of planning and testing innovative interventions of psychoeducation in providing salient knowledge, active learning opportunities and skills training in baby care in the early postpartum period. Such a universal approach of preventing postnatal depression could also provide an intervention that is non-stigmatised.

In summary, the various psychosocial and/or psychological interventions in the literature have focused on mothers who were either depressed or at high

risk of developing postnatal depression. There were methodological limitations such as high attrition rate, poor compliance to the standardised protocol and selection bias of the participants. Furthermore, the majority of the interventions have been conducted among Western mothers and very limited studies using preventive interventions for postnatal depression among multi-racial Asian mothers. Therefore, by overcoming methodological flaws, future research could focus on developing and testing the theoretically grounded, culturally sensitive, systematically delivered and empirically sound multi-modal interventions to prevent and reduce postnatal depression.

### Self-Efficacy

Self-efficacy is a cognitive process, which is defined as a person's belief in their ability to organize and perform a particular task successfully (Bandura, 1997). Self-efficacy is a relatively new concept in maternal and child health nursing and is often confused and used interchangeably with the related concepts such as maternal confidence and competence (Kapp, 1998; Leahy-Warren 2005; Montigny & Lacharite 2005; Ngai, Chan, & Holroyd, 2011).

Bandura (1997) had clarified that confidence focuses on strength of the belief a person has about their capability but not its certainty. Self-efficacy, however, includes both the strength of the belief and the affirmation of capability (Bandura, 1997). Similarly, maternal competence is a judgment that others hold about the mother's ability in performing newborn care tasks and is different from self-efficacy which is a mother's own judgment about her ability (Montigny & Lacharite, 2005). In this study, based on Bandura's self-efficacy theory, the maternal parental self-efficacy is defined as the new mother's judgment of her capabilities to execute infant care skills which is important in facilitating adaptation to motherhood (Haslam et al., 2006; Leahy-Warren et al., 2011a; Montigny & Lacharite, 2005).



## Measurement of Self-Efficacy

There is substantial variability in the measurement of self-efficacy. Coleman and Karakker (2000) identified four approaches to assess maternal self-efficacy such as task-specific, domain specific, domain general and general self-efficacy. The task specific self-efficacy refers to a personal perception of one's ability to complete a definite task within a specific domain, for example, the mother's ability to breastfeed. Examples of such scales include the Breastfeeding Self-efficacy scale (Dennis, 2003).

The second approach is domain-specific self-efficacy which refers to all the tasks that make up that particular domain of functioning; for example, in the case of parenting a newborn, parents are expected to have perceptions of their ability related to all the newborn care tasks such as feeding, cleaning and soothing their babies. An example of domain specific measure is Perceived Maternal Parental Self-Efficacy (PMP S-E) (Barnes & Adamson- Macedo, 2007). The 20-item PMP S-E measures various newborn care tasks specific to self-efficacy within a broader domain of parenting.

The third approach is the domain-general (or global) self-efficacy scale that measures self-efficacy in one domain of functioning such as parenting but does not specify the particular tasks or activities within which they must be performed (Bandura, 1997). An example is Parental Sense of Competence Scale.

The fourth approach is general self-efficacy that measures efficacy beliefs across several varied domains of functioning with parenting representing only one such domain. An example is Tool to Measure Parenting Self-Efficacy (TOPSE) (Kendall & Bloomfield, 2005).

Bandura (1997) does not support measuring self-efficacy using the general approach such as domain general or general self-efficacy. He argued that this approach is irrelevant and could not predict domain or task specific functions and hence recommended the domain or task specific approaches. One such

domain specific instrument measuring self-efficacy is PMP S-E, as mentioned previously. PMP S-E (Barnes & Adamson- Macedo, 2007) scale has been robustly tested for internal and external reliability, as well as face, content and constructs validity. It has been successfully used to assess maternal parental self-efficacy on parenting and performing various newborn care tasks among Western mothers (Leahy-Warren, 2005; Leahy-Warren et al., 2011a) but not among Asian mothers.

### Significance of Self-Efficacy for New Mothers

Self-efficacy beliefs influence the efforts a person will put in specific newborn care activities (Bandura, 1997). In addition, the resilience to adversity, the stress and depression experienced in coping with various demands and the levels of accomplishment felt are all consequences of self-efficacy beliefs. For example, mothers who have high self-efficacy level would be more persistent when facing difficulties or challenges in newborn care (Coleman & Karraker, 1997; Teti & Gelfand, 1991) and are more likely to initiate productive courses of actions and adaptive coping (Bandura, 1997; Coleman & Karraker, 1997). In contrast, those who feel that they cannot produce desired results or are unable to complete the desired actions to achieve the outcomes would have little incentive to persevere when faced with obstacles (Bandura, 1997). Thus, the level of self-efficacy will determine whether the necessary efforts would be initiated and for how long they would be maintained (Bandura, 1997; Coleman & Karraker, 1997; Zeiss, Gallagher-Thompson, Lovett, Rose, & Mckibbin, 1999).

Self-efficacy also has a profound influence on parenting practices. A study on 500 low-income parents showed that parental efficacy was strongly related to the mother's child rearing practices across different ethnic groups (MacPhee, Fritz, & Miller-Heyl, 1996). Other studies also suggest that maternal parental self-efficacy is a major determinant of competent parenting behaviours and is closely linked to newborn development (Coleman & Karakker, 1997; Teti & Gelfand, 1991; Zeiss et al., 1999). Maternal self-efficacy beliefs have also been found to mediate psychosocial variables such as social support and

depression (Coleman & Karakker, 1997; Haslam et al., 2006). Based on Bandura's self-efficacy theory, Kapp (1998) compared the confidence level of new mothers in the hospital and two weeks post delivery at home. Maternal and infant care confidence scale was used to screen a convenience sample of 104 mothers postpartum. The results showed that mothers needed help and to be educated on self-care and newborn care up to two weeks post delivery. It was recommended that midwives needed to provide individualised and planned care to the women by assessing their individual needs (Kapp, 1998). Thus, psychosocial interventions to enhance maternal parental self-efficacy during the postnatal period are crucial.

### Factors Influencing Self-efficacy

Self-efficacy is one of the crucial components for maternal transition to motherhood that not only affects the maternal psychological well-being, but also has an impact on the child's psychosocial development (Coleman & Karakker, 2000; Sander & Wooley, 2005). Hence, to facilitate the smooth transition to early motherhood, it is important to understand the factors associated with maternal parental self-efficacy so that supportive interventions can be planned and delivered to mothers in need (Ngai et al., 2010).

Multiple factors such as personal resources and social environmental contexts are associated with self-efficacy (Mercer, 2004). Maternal attributes such as age, socioeconomic status, child-rearing attitude, prior experiences with child care, emotional state; infant attributes such as infant health status, more irritable and temperamentally difficult child and the environmental attributes such as family functioning, marital satisfaction and social and cultural background play an important part in enhancing self-efficacy (Leahy-Warren & McCarthy, 2010; Mercer & Ferketich, 1995; Ngai et al., 2010; Ngai et al., 2011; Reece & Harkless, 1998; Salonen et al., 2009; Tarkka, 2003).

Leahy-Warren and McCarthy (2010) conducted an integrated literature review involving eight quantitative studies on maternal parental self-efficacy and reported statistically significant positive increase in maternal parental self-

efficacy over time from as early as last trimester in pregnancy to sixteen weeks postpartum. The positive relationship was also found between self-efficacy and multi-parity, social support, parenting and marital satisfaction (Leahy-Warren & McCarthy, 2010). They also reported a negative relationship between self-efficacy and maternal stress and postnatal depression. They concluded that among many factors, which influence self-efficacy, the positive social support is one of the most important factors that enhance maternal parental self-efficacy whereas postnatal depression reduces maternal parental self-efficacy. The assessment of maternal self-efficacy, social support and psychological state such as postnatal depression in the early postnatal period is recommended. Similar results were also reported by other researchers (Reece & Harkless, 1998; Salonen et al., 2009). Reece and Harkless (1998) examined 32 parents for their self-efficacy during pregnancy and at four months postpartum and reported that over time, in the postpartum period, self-efficacy increased. Similarly, Salonen et al. (2009) studied self-efficacy among 1300 families and found that multi-parity; type and quality of social support and depressive symptoms influenced the self-efficacy of both mothers and fathers. To examine the self-efficacy from the perspective of mothers themselves, an exploratory descriptive study (Ngai et al., 2011) was conducted on Chinese primiparas. The interviews with mothers revealed that social support and maternal satisfaction due to the positive experiences of infant care enhanced their self-efficacy.

Mercer and Ferketich (1995) in their exploratory study on both primiparas ( $n = 166$ ) and multiparas ( $n = 136$ ) found that 34% of variance in primiparas self-efficacy was explained by the mothers' sense of mastery and depression at one month postpartum. Tarkka (2003) also reported that depression (38%) and the social support received (66%) were the strongest predictors of self-efficacy among 248 Finnish first-time mothers. However, the predictor variables in these two studies were evaluated concurrently, which did not explain causality. Especially to find predictors for a construct, a longitudinal evaluation is needed. To overcome this, Ngai et al. (2010) examined the self-efficacy among primiparas from prenatal to six weeks postnatal longitudinally and reported that depression and maternal satisfaction with newborn care are

the main predictors of self-efficacy. However, self-reported instruments were used to report the self-efficacy that might have response bias. Similar results were supported by earlier longitudinal descriptive study (Ngai et al., 2009) where prenatal postnatal depression was found to affect the maternal competence and satisfaction at 6 weeks postpartum among 184 primiparas. It was emphasised that culturally competent care should be provided to the mothers especially to the primiparas according to their individual needs. However, maternal competence was used to describe self-efficacy and domain general instrument such as Parental Sense of Competence was used to measure self-efficacy, which might limit the validity of the results.

Methodological flaws such as small sample size (Leahy-Warren & McCarthy, 2010; Recce & Harkless, 1998), collection of data at different time periods in various studies such as one week (Salonen et al., 2009), one month (Mercer & Ferketich, 1995), four to eight months postpartum (Recce & Harkless, 1998; Tarkka, 2003), inclusion of both primiparas and multiparas (Leahy-Warren & McCarthy, 2010; Recce & Harkless, 1998; Salonen et al., 2009) and only primiparas (Ngai et al., 2010; Ngai et al., 2011; Tarkka, 2003), use of maternal competence and not self-efficacy (Ngai et al., 2009) and use of different instruments to measure self-efficacy (Leahy-Warren & McCarthy, 2010) have limited the generalisability of the studies and made comparisons difficult among the studies. In addition, most of the studies were conducted on Western mothers or specific ethnic groups such as Chinese mothers.

Bandura (1997) suggested four factors that allowed an individual to construct self-efficacy beliefs such as mastery experience, vicarious experience, verbal persuasion and physiological and affective state. For a new mother, mastery experience could be her previous experience with newborn care before becoming a mother that would contribute to her personal parental self-efficacy. Any prior successful experience with newborn care will confirm parental efficacy, however, any failures in newborn care before establishing self-efficacy, will wane it (Bandura, 1997). Froman and Owen (1990) confirmed through a questionnaire survey on 200 mothers that mothers who had an experience of caring for infants previously had stronger self-efficacy

beliefs than those who did not have such experience. They also highlighted that mothers had higher self-efficacy for the tasks that were most frequently performed such as changing diapers. That could also be one of the reasons that primiparas having no prior newborn care experience have lower self-efficacy as compared to multiparas (Kapp, 1998; Leahy Warren & McCarthy, 2010; Ngai et al., 2010). This suggested the importance for mothers especially the primiparas to have more hands on opportunities and practice on newborn care tasks in the early postnatal period.

Vicarious experience is gained by observing others performing a task. It offers an individual to judge their capacities against a reference point to master the skills (Bandura, 1997). It provides an opportunity to learn through observation and modeling. Hence, parent training or educational programmes have been found to be successful in enhancing maternal self-efficacy (Bloomfield & Kendall, 2007; Gross, Fogg, & Tucker, 1995; Tucker, Murney, & Lamont, 1998). Bloomfield and Kendall (2007) surveyed 356 parents of children aged 6 years and below who participated in various parenting programmes in the United Kingdom. These parenting programmes were mainly focused on strengthening parent-child relationships, behaviour management and parent education and support. Parents exhibited significant increase in self-efficacy following a parenting programme (Bloomfield & Kendall, 2007). Likewise, Gross et al. (1995) and Tucker et al. (1998) reported enhanced self-efficacy among parents of two year old toddlers who participated in the behavioural parent-training programme. The one-year follow up with 46 parents (Tucker et al., 1998) supported that the participation in the programmes had provided them opportunities to observe and learn from midwives thus enhancing their self-efficacy.

Verbal persuasion in terms of informational and relational support by others is the third way of enhancing self-efficacy. Bandura (1997) suggested that by persuading others verbally that they possess what it takes to master particular skills would likely lead to more efforts from the person in achieving any tasks than if the person concentrates on their limitations. As such, professionals such as midwives and significant others such as husbands can play an

important role in reaffirming maternal parental self-efficacy in newborn care tasks with their positive feedbacks and support (Leahy-Warren, 2005; Teti & Gelfand, 1991). Leahy-Warren (2005) surveyed 135 Irish primiparas and reported that appraisal support in the form of positive feedback about maternal performance on newborn care tasks from their husbands and maternal mothers were associated with increases in maternal parental self-efficacy for new mothers. In line with that, Teti and Gelfand (1991) commented that the belief of husbands in their wives' capabilities of newborn care have been found to enhance maternal perceptions of their efficacy during the postpartum period. This further supports the need of planning educational programmes by involving significant others and educating new mothers on the importance of relational support such as seeking feedbacks.

Physiological and affective states of an individual can influence maternal self-efficacy as they can be interpreted as signs of vulnerability or inefficacy (Bandura, 1997). Hence, the fourth way of enhancing maternal self-efficacy is through boosting physical and psychological well-being of mothers. The physical experiences such as pain, interrupted sleep, fatigue and tiredness (McQueen & Mander, 2003) and psychological states such as stress and depression (Glazener et al., 1995) are common during the early postnatal period and pose a serious threat to maternal self-efficacy. It was suggested that by enhancing positive mood states and by providing adequate social support from midwives and significant others, self-efficacy can be enhanced (Leahy-Warren & McCarthy 2010). Similarly, by educating mothers on physical changes and challenges in the early postpartum period would provide them realistic expectations so that they are more prepared during the transition to early motherhood (Brown & Lumley, 2000). McQueen and Mander (2003) further stressed that education to new mothers should foster opportunities and more effective coping skills to facilitate adjustment to motherhood.

Knowing the influencing factors of maternal parental self-efficacy, midwives can create opportunities to enhance maternal parental self-efficacy in the convenient home environment. The education and advice could be provided on newborn care; maternal physical and psychological well-being as well as

legitimatising the need for support from significant others. Hence, Bandura's theory of self-efficacy provides theoretical basis to plan educational programmes in the early postnatal period especially for the primiparas. However, there is a paucity of studies on such educational programmes in the early postnatal period. Due to the knowledge gap, there is a need to plan such programmes with parents of young infants to ensure optimal physical and psychological development of the newborns.

### Interventions for Enhancing Self-Efficacy **Using Bandura's Self-efficacy Theory**

Bandura's self-efficacy theory has been used in social sciences since the 1980's (Montigny & Lacharite, 2005). The benefits of this theory have also been procured in nursing science (Coleman & Karraker, 2000; Kapp, 1998; Lenz & Shortridge- Baggett, 2002).

Using Bandura's self-efficacy theory as a framework, interventions have been developed to enhance self-efficacy regarding various health behaviours in nursing research (Lenz & Shortridge-Baggett, 2002) and bring behavioural changes in clients such as self-monitoring of diabetes, fall prevention and smoking cessation (Cheal & Clemson, 2001; Dijkstra & Wolde, 2005; Tan, Magaraey, Chee, Lee, & Tan, 2011). Among the four approaches of increasing self-efficacy, that is, mastery experience, vicarious learning, verbal persuasion and emotional and physiological states, evidence found that interventions based on combination of all, would bring better results (Bandura, 1997). Cheal and Clemson (2001) further recommended that multi-focused interventions including health education, skills practice and mastery experience, role modeling and self-affirming verbal persuasion produced the best results in enhancing self-efficacy. Dijkstra and Wolde (2005) used such recommendations in their experimental study and reported that by enhancing self-efficacy, the smoking cessation and retention of non-smoking status among ex-smokers can be achieved. Similarly, Elfhag and Rossner (2005) examined the benefits of self-efficacy enhancing interventions in losing weight and maintaining the weight loss for up to 6 months after the



intervention. The self-efficacy boosting interventions were also successful among chronic conditions such as the type-2 diabetic control (Koopman Van den berg & Van der Bijl, 2001). The above literature reiterates that various health behaviour changes and adaptations can be achieved by interventions focusing on self-efficacy (Lenz & Shortridge-Baggett, 2002).

In perinatal nursing, the benefits of self-efficacy based interventions have been procured but the main focus remained on pregnancy and childbirth. Ip et al. (2009) planned and evaluated an educational intervention to improve primiparas' ability to cope with childbirth. A 90-minute educational intervention randomly delivered to 133 primiparas benefitted them with improved self-efficacy for childbirth and reduced pain and anxiety during the first two stages of labor. However, data on pain and anxiety was collected retrospectively, which might not reflect the actual feelings towards childbirth if the data would have been collected on the same day. Also, the participation attrition rate was at 30%, which might further limit the generalisability.

The psychoeducation delivered to primiparas during childbirth education (Ngai et al., 2009) reported that postnatal depression were reduced and learned resourcefulness improved at 6 weeks and 6 months follow-up post delivery. No change in self-efficacy was observed during the two points of data collection. This might be due to the theoretical framework being used in the study. The study was based on Rosenbaum's (1990) learned resourcefulness theory where the main focus was on cognitive restructuring and problem solving and hence showing no improvements in self-efficacy. Also, the group allocation for the intervention and control groups was not randomised.

Other researchers (Campbell, 1996; Nichols et al., 2009; Noel-Weiss et al., 2006) have evaluated the self-efficacy theory based interventions during childbirth education with a special focus on breastfeeding. Campbell (1996) reported that mothers who receive Breastfeeding Promotion Nursing Intervention during childbirth education had higher breastfeeding success and satisfaction at six weeks postpartum. Nichols et al. (2009) reported that mothers receiving breastfeeding self-efficacy intervention had higher self-

efficacy scores and showed a trend towards breastfeeding their infants longer and more exclusively at four weeks postpartum. Noel-Weiss et al. (2006) further added to the success of breastfeeding, enhancing self-efficacy workshop in improving maternal self-efficacy in breastfeeding. Nonetheless, these studies had small sample size and did not report power analysis that limited to evaluate the effectiveness of interventions (Campbell, 1996). Also, the interventions were a single teaching session (Nichols et al., 2009; Noel-Weiss et al., 2006), which could limit the long-term success of such interventions. Hence, further research is needed to include multimodal interventions evaluating the effects of self-efficacy interventions, specifically, in the early postnatal period.

In summary, there are limited studies based on Bandura's self-efficacy theoretical framework in maternal and child health nursing focusing on postnatal education. As most of the available studies have focused on antenatal education, breastfeeding (McQueen et al., 2011; Noel-Weiss et al., 2006) and childbirth education (Ip et al., 2009), there is a need to develop educational programmes in the early postnatal period.

### Social Support

According to the social exchange theory (Blau, 1964; Homans, 1961), social support entails networking between two people that enables them to cope with stressful events. The interpersonal transactions between individuals provide them with emotional support and stress related aid (Haslam et al., 2006). Social support plays an extremely important role in the adaptation to major life events such as transition to motherhood by enabling new mothers to attain their maternal role (Tarkka & Paunonen, 1996). Social support has been associated with better maternal well-being, positive attitudes and more positive influences on newborn behaviour and development (Dunst, Trivette, & Cross, 1986). Acknowledging the significance of social support, the national (Leahy-Warren, 2005; Tarkka & Paunonen, 1996) and international guidelines reinforce the importance of support in the early postpartum period (World Health Organization, 2005).

House (1981) defines social support as a combination of structural support and functional support. The structural element of social support consists of social networks among individuals and these individuals are the sources of social support such as formal support from midwives and other health professionals and informal support from significant others, such as husbands and mothers. The functional element of social support consists of exchange activities that take place among individuals (House, 1981). Four components of functional social support are emotional, instrumental, informational and appraisal support (House, 1981). Having a variety of functional support, that is, emotional support (such as provision of love, care and empathy to new mothers), instrumental support (such as provision of practical support, e.g. house-hold chores), informational support (such as provision of knowledge, e.g. newborn care advice) and appraisal support (such as provision of constructive feedback and affirmation to enable self evaluation by mothers) from different care providers, both from healthcare professionals and significant others, is important for new mothers (Haslam et al., 2006). It has also been proposed that the support provided to new mothers should be congruent to their individual needs (Haslam et al., 2006; Whittaker & Cowley, 2012). For instance, the emotional support provided to mothers who need instrumental support in newborn care would not be effective.

### Social Support Needs of New Mothers

All four types of functional social support is crucial for new mothers, however, the focus primarily remained on information and instrumental support on breastfeeding (Hoddinott & Pill, 1999; Tarkka & Paunonen, 1996). This necessitates the need of understanding the various social support requirements of new mothers.

Many studies (Berger & Cook, 1998; Johansson & Darj, 2004; Kapp, 1998; Leahy-Warren, 2005; Martell, 2001; McVeigh, 1999; Tarkka & Paunonen, 1996; Tarkka et al., 2000; Wilkins, 2006) have assessed the type of social support needs and sources of social support for new mothers, highlighting the

need for planning and delivering appropriate supportive interventions to mothers.

Berger and Cook (1998) examined social support needs of new mothers before the hospital discharge from both mothers' and nurses' perspectives in a cross-sectional survey study in United States of America (USA). The social support needs were defined as learning needs of mothers in the early postpartum period and data were collected by a postpartum questionnaire developed by Davis, Brucker and MacMullen (1988). In total, 82 nurses and 236 mothers completed the questionnaires and both highlighted the need of educational support related to the immediate physical health requirements of both mothers and newborns. Primiparas expressed the need for more education on several topics on maternal and newborn care as compared to the multiparas and thus endorsing the fact that primiparas' support needs are more than the multiparas (Johansson & Darj, 2004). However, the low response rate of 59% and no description on whether the intention-to-treat analysis was performed, limited the reliability of the findings.

Similarly, Kapp (1998) screened new mothers (n = 104) in USA for their social support needs in the early postpartum period. It was found that new mothers needed educational support in various newborn care tasks such as baby bathing, sleeping and physical care and support on self-care within two weeks postpartum (Kapp, 1998). Johansson and Darj (2004) analysed the self-written questions on newborn care and self-care needs of 42 new mothers, further highlighting that mothers need information on breast-feeding, newborn care tasks such as burping, hygiene and sleeping and self-care tasks such as care of stitches, after pains and diet after the early discharge from the hospital. The low response rate (59%) (Jahansson & Darj, 2004) and small sample size (Kapp, 1998) limited the generalisability of both studies.

Leahy-Warren (2005) examined both types (functional) and sources (structural) of social support received by 135 Irish primiparas at six week postpartum via self-administered Perinatal Infant Care Social Support (PICSS) questionnaire. The main type of support received by the mothers that was

correlated to their confidence was appraisal support and informational support. The main source of appraisal support was the husbands and the main sources of informational support were the midwives/public health nurses and maternal mothers. Convenience sampling was used to recruit mothers, which might not be the representative of the entire population and hence limits the generalisability of the study.

In line with Leahy-Warren (2005), Tarkka et al. (2000) and Tarkka and Paunonen (1996) highlighted the need of support from both nursing professionals and close relatives such as husbands and mothers for the new Finnish mothers to cope better with childcare. However, the data were collected from as early as day five from both primiparas and multiparas while they were still in the hospital (n = 153) (Tarkka & Paunonen, 1996) to eight months (Tarkka et al., 2000) postpartum from primiparas (n= 271). Nevertheless, the main type of functional support received by new mothers from the nurses/midwives in the hospital was informational support whereas the emotional support was the least kind of support received. At eight months postpartum, the primiparas received functional support from loved ones and the emotional, appraisal and instrumental support from public health nurses. Different definitions of social support such as intentional human interactions based on Kahn (1979) were used in the studies. Also, functional support was limited to informational and emotional support only. There was no emphasis on instrumental and appraisal support. Lastly, the different periods of measuring social support makes comparisons difficult (Tarkka & Paunonen, 1996; Tarkka et al., 2000).

Wilkins (2006) interviewed eight British mothers in order to understand the areas of support that enabled their adjustment to early motherhood. Mothers highlighted the support from midwives and their loved ones were crucial for developing skills and confidence in newborn care. Mothers verbalised the importance of having easy read reference guides and phone follow-up during the unavailability of midwives. The homogeneous group of Caucasian mothers with small sample size limits the generalisability of the study.

Martell (2001) and McVeigh (1999) reported consistent findings among American and Australian primiparas. Martell (2001) conducted qualitative interviews with 32 American primiparas at one week and two weeks post delivery and McViegh (1999) conducted a quantitative questionnaire survey with 79 Australian primiparas at six weeks post delivery. McVeigh (1999) used Inventory of Functional Assessment after Childbirth (IFAC) to collect the data. However, no information on the reliability and validity of the tool was presented in the study (McViegh, 1999). Both studies (Martell, 2001; McVeigh, 1999) highlighted the social support needs of new mothers specifically with the infant care and self-care such as informational support on fatigue and routines of daily living with infant. However, the homogeneous group of Caucasians well-educated and high-income mothers in both the studies limit the generalisability of the study to a specific group of mothers only. Also, the focus of both studies (Martell, 2001; McVeigh, 1999) were to explore the overall experiences of the mothers instead of their specific functional and structural social support needs that make it difficult to use the findings to plan the adequately focused educational interventions for the new mothers.

Sword and Watt's (2005) examined the social support needs of 1,250 Canadian mothers using a self-developed instrument and demonstrated that antenatal and postnatal education in the hospital did not adequately address mothers' learning needs as new ones continued to develop after hospital discharge. Informational and affective support on maternal physical and emotional changes and adaptations, care of stitches, postnatal complications, postnatal pain and pain relief, breastfeeding, diet, exercise, pelvic floor exercise were the main needs of new mothers (Sword & Watt, 2005). Infant care learning needs include informational support needs on signs of infant illness, infant settling/sleeping as well as knowledge of community supports and services (Sword & Watt, 2005). However, the paper did not report the validity and reliability of the instrument.

Barnes et al. (2008) in their telephone survey on Australian primiparas (n = 151) at three months and focus group interviews (n = 8) at seven to nine

months postpartum and Bowman (2005) in her review of understanding postnatal learning needs describes similar maternal and infant needs among new mothers. However, data was collected at different time lines such as four weeks postpartum (Sword & Watt, 2005) and three to nine months postpartum (Barnes et al., 2008) using different instruments in these studies making comparisons difficult. Also, Sword and Watt (2005) did not describe the participants (either primiparas or multiparas or both) being studied in their research.

In Asian countries, Ho and Holroyd's (2002) study among Hong Kong Chinese mothers found that primiparas lacked confidence and needed practical support in carrying out infant care activities such as infant bathing and managing common infant problems. Ho and Holroyd (2002) conducted focus group interviews among 11 mothers postnatally. However, the exact timing of the interviews was not mentioned in the study. The mothers verbalised lack of informational support on realities of newborn care and unrealistic preparation for breastfeeding during the antenatal classes, which left them unprepared for the early postpartum period. Mothers also verbalised the need for follow-up support from health professionals after the hospital discharge.

In Singapore, Ong et al.'s (2013) qualitative study on 13 Singaporean primiparas found the lack of support received on various newborn care tasks and breastfeeding that added to their stress. The mothers felt helpless in the early postpartum period especially, in coping without professional support. The support from their husband was lacking and mothers-in law added stress by their intrusive demands of forcing new mothers to follow traditional practices. Mothers stressed the need of postnatal follow-up support in the form of home visits (Ong et al., 2013). The Ong et al.'s (2013) study recruited English-speaking mothers from a single Hospital. These participants might not represent non-English speaking mothers in Singapore and hence limited the generalisability of the study.

The Asian socio-cultural system differs from those in the West. Hence, the support available to Asian mothers is different from those available to Western

mothers. Peculiar to the Asian context, the mothers, especially Chinese, Indian and Malays are expected to rest in the first one month postpartum (Naser et al., 2012). The resting period is known as 'Doing the month' where mothers have to follow certain rules and they are expected to receive extra care and support from their family members, especially, the older members such as maternal mothers and mothers-in law (Holroyd, Katie, Chun & Ha, 1997; Holroyd, Lopez & Chan, 2011; Hung, 2005). The 'doing the month' ritual is believed to prevent future illness and to maintain mothers' physical and psychological health (Holroyd et al., 2011; Naser et al., 2012; Pillsbury, 1978) as the mothers or mothers-in-law are expected to provide advice and guidance concerning newborn care and maternal self-care.

However, Whitaker and Cowly (2012) warned that the mere availability of a support system does not guarantee benefits for the mothers unless individual mothers have been satisfied with it. Congruent with Whitaker and Cowly (2012), an assessment of social support needs of 130 Chinese mothers in Mainland China showed that support from the mothers-in law had actually added stress to the primiparas (Chan et al., 2002; Gao et al., 2008). Similarly, Heh et al. (2004) found that unwanted emotional support from mothers-in law was significantly associated with higher depressive scores among Taiwanese primiparas. Leung, Arthur and Martinson (2005) in their phenomenological study among 11 Hong Kong Chinese mothers found that mothers felt stressed due to conflicts with culture and traditional practices. Leung et al. (2005) recommended nurses to be familiar with the cultural rituals, before educating the mothers.

In summary, evidence found various unmet social support needs of new mothers in the early postnatal period. Primiparas have more needs than multiparas. The early discharge from the hospital and lack of opportunities of adequate educational programmes further add to their stress. However, reviewed studies had used varied definitions to describe social support and varied instruments were used to measure the social support. Only few studies (Leahy-Warren, 2005, Tarkka et al., 2000) had measured both the functional and structural social support. It is important to extend such studies by



measuring both types of support among other ethnic mothers such as Asian primiparas. The reviewed studies also found that support from significant others were as important as the support from healthcare professionals for new mothers. Hence, husbands and mothers-in law could be active participants of postnatal education. Studies argued that new mothers preferred the professional follow-up support in the early postpartum such as home visits by midwives, educational reading materials covering the various topics of self and newborn care and phone follow-up enticing the need of planning multi-interventions study (Barnes et al., 2008; Martell, 2001; Ong et al., 2012; Wilkins, 2006)

Also, it is crucial for healthcare professionals to adopt culturally specific perspectives, which include coping strategies, support systems, and incorporating cultural beliefs while educating new mothers. It is important to identify traditional cultural practices that may be hazardous to the health of the mothers and their newborns (Holroyd et al., 2011; Naser et al., 2012; Ong et al., 2013). Lastly, to plan interventions to enhance social support, it is important that support is analysed within the realms of the support provider, the relationship between the care provider and the receiver and the overall social structure.

### Measurement of Social Support

The literature (Berger & Cook, 1998; Kapp, 1998; Leahy-Warren, 2005; Martell, 2001) has found various unmet social support needs of new mothers including emotional and informational support in the early postpartum period. This necessitated the need of measuring the social support new mothers receive and their needs in the early postpartum period so that appropriate interventions could be provided. Very few social support measuring instruments are available that has been tested for its psychometric properties (Leahy-Warren, 2005). As such, Kapp (1998) measured social support using Maternal and Infant Care Scale, a visual analog scale developed by the author. However, the details on the psychometric testing of the instrument were not reported. Leahy-Warren (2005) developed Perinatal Infant Care Social

Support (PICSS) instrument to measure both the functional and structural social support. It was a validated tool and was formulated based on social exchange theory (Blau, 1964; Homans, 1961) and adopted the definition of social support by House (1981). The instrument was tested for its psychometric properties globally and showed sound internal consistency and validity hence requiring it to be tested among multi-racial Asian mothers.

### Interventions to Enhance Social Support

Literature review found interventions that could facilitate transition to motherhood by enhancing social support including home visits by professionals, phone follow-up, reading materials and peer support (Christie & Bunting, 2011; Coren, Barlow & Brown, 2003; Dennis & Kingston, 2008; Hannula, Kaunonen & Tarkka, 2008; Reich, Penner & Duncan, 2011).

**Home Visits Support.** Home visits, especially, after the early hospital discharge is one of the best ways of providing social support in the early postpartum period (Christie & Bunting, 2011). New mothers especially, first-time mothers welcome the availability of a midwife support in their familiar home environment during the early postnatal period (Fenwick et al, 2010; Zadoroznyj, 2006). A review of the literature shows that follow-up postnatal home visit support varies globally. This can range from a single home visit to several home visits (7 – 10 days). It also varies in terms of care providers such as midwives; community workers and non-health care professionals such as home care workers in certain parts of the world (D'Amour et al. 2003; Morrell et al. 2000). Many experimental descriptive studies and qualitative studies (Armstrong, Fraser, Dadda & Morris, 1999; Browne & Herbert, 1997; Chaffin, Kelleher & Hollenberg, 1996; Marcenko & Spence, 1994; Olds, Henderson & Kitzman, 1994) have examined the benefits associated with postnatal home visits of vulnerable families and mothers who belong to the high-risk population group such as family violence, drug abuse and financial stress. These studies highlighted the effectiveness of these visits to ensure holistic care including physical and psychosocial well-being of the mothers and to facilitate a smooth transition to motherhood. Similarly, studies

conducted on low-risk mothers (Bashour et al., 2008; Bennett & Tandy, 1998; Johansson, Aarts & Darj, 2010; Lock & Gibb, 2003) had shown the effectiveness of home visits on various maternal outcomes such as enhanced satisfaction and acceptability of home visits by mothers and their families.

The retrospective descriptive study (Bennett & Tandy, 1998) on a sample of 365 closed-record chart review concluded that extensive education can be planned and delivered to mothers and their families at their familiar home environments to reinforce the pertinent information that has already been covered in hospitals. The home visits thus eased the transition from hospital to home. It was emphasised that mothers had intense emotional and physical needs and needed guidance within first two weeks post delivery. First-time mothers experienced more stress and maternal problems. Home health nurses were able to detect the problems early and were able to provide timely education. This study collected data retrospectively from the case notes that might have limited the reliability of the results.

Bashour et al. (2008) examined the effects of postnatal home visits on maternal and infant outcomes among 876 Syrian mothers within first four months post delivery. They found enhanced maternal satisfaction and higher proportion of exclusive breastfeeding among mothers with home visits from midwives as compared to no home visits. No difference was found with the frequency of home visits as the single visit produced similar effects. Similarly, Bashour et al. (2008) did not find the differences on the biomedical outcomes of the study such as contraceptive uptake and infant morbidities and it was recommended to look into other non-biomedical outcomes including social support and emotional well-being of the new mothers to improve postnatal support in future studies.

Focused group interviews (Johansson et al., 2010) with 21 Swedish couples who delivered their first baby concluded that home based professional support from midwives were welcomed by parents and it had enabled them to improve their parental confidence and satisfaction in looking after their newborns. The midwives' support also enabled them to confirm their maternal new role as a

parent. Mothers felt the convenience of receiving education at home as it was less chaotic and they felt well rested. Similar results using a phenomenology approach (Lock & Gibb, 2003) on five Australian primiparas and multiparas were reported in that, mothers felt more secure and supported by midwives in their familiar home environment. The support by midwives at their home has provided them a sense of control, safety and confidence in looking after their newborns. Other study (Zadoroznyj, 2006) on Australian mothers confirmed the importance of rest and practical home support in the postnatal period to maternal well-being and successful bonding.

The aforementioned studies (Bashour et al., 2008; Bennett & Tandy, 1998; Johansson et al., 2010; Lock & Gibb, 2003) have been conducted on Western or Middle-Eastern mothers and their generalisability among Asian mothers is uncertain. Also, the varied group of mothers such as primiparas (Bashour et al., 2008; Johansson et al., 2010) and both primiparas and multiparas (Bennett & Tandy, 1998; Lock & Gibb, 2003) were studied using numerous outcome variables ranging from biomedical outcomes, breastfeeding rates, mental health outcomes to mere satisfaction level with the home visits further limiting the generalisability. Specific to Bennett and Tandy (1998), the collected data were from case records, which might not be accurate due to missing information. Furthermore, the small sample size of some studies for example, five mothers in Lock and Gibb (2002) and homogeneous group of mothers with normal vaginal deliveries (Johansson et al., 2010) might compromise the generalisability. Also, varied groups of professionals such as midwives (Bashour et al., 2008; Johansson et al., 2010), community or public health nurses (Bennett and Tandy, 1998) and non-professionals such as home care workers (Zadoroznyj, 2006) provided home visits support. Thus, it was difficult to compare outcomes of such support.

Christie and Bunting (2011) examined the effects of the frequency of home visits on primiparas' outcomes such as satisfaction and use of emergency services at eight weeks and seven weeks postpartum. They found that mothers who received a single home visit were equally satisfied as compared to mothers with six home visits and used similar amounts of emergency medical

services. A well-planned single home visit can benefit new mothers especially, primiparas (Bashour et al., 2008; Hannula et al., 2008; Whittaker & Cowley, 2012). Likewise, Lof et al. (2006) in their qualitative interview with eight Swedish primiparas found that a single follow-up home visit with a booked telephone call was sufficient as a programme for mothers choosing an early discharge. It was the content, not the frequency of visits that mattered to the new mothers. However, Christie and Bunting (2011) only focused on the duration of the visits and did not consider comparing the content covered during the home visits.

Hannula et al. (2008) in their systematic review of 36 articles found that home visits and telephone support together with peer support were very effective in supporting breastfeeding for new mothers. They also emphasised to plan interventions based on individual needs and cultural background of the mothers and families. Only less than half of the included studies were of high quality. Also, all the included articles were from Western countries studying Caucasian mothers limiting their generalisability to mothers in Asian contexts.

A cluster-randomised trial conducted on 2,064 British mothers reported that tailored individualised and flexible support during home visits could improve mother's mental health (MacArthur et al., 2002). The participants were recruited from 36 general practitioner clusters. There could be a chance of recruitment bias due to the use of cluster design that might question the validity of the results.

The systematic review conducted by Shaw et al. (2006) found that randomised controlled trials (RCTs) examining the effectiveness of postnatal support have endorsed that new mothers preferred support in the form of home visits and such interactions enhanced maternal satisfaction. However, the reviewed RCTs used diverse maternal outcomes such as psychological well-being and physical health measuring at different time intervals using different instruments making comparisons difficult.

Some studies (Escobar et al., 2001; Forster et al., 2008; Jirojwong, Rossi, Walker, & Ritchie, 2005) reported that home visits did not have benefits and was not comparable to hospital support post delivery. This lack of better outcomes with the home visit support might be due to a lack of protocol on what needs to be done during home visits (McNaughton, 2004). In support of this argument, literature review on home visiting interventions including 13 articles on experimental design highlighted the need for interventions with theoretical protocols to address maternal problems and target outcomes (McNaughton, 2004). It was explained that home visits are just a context and what matters the most is the interventions being planned during these visits. It is not the frequency of visits but the theory based, outcome driven, culturally specific interventions that can provide adequate support to new mothers and their families. The review suggested future research focusing and testing theory based and outcome driven home visit interventions.

In summary, due to the early postnatal discharge, majority of the maternal and newborn health care needs remain unmet. This necessitates follow-up postnatal support care in the form of home visits for new mothers. Evidence suggested that providing social support in the form of home visits promote the physical and emotional well-being of both mothers and their newborns. However, the majority of home visits focused on knowledge and skills to enhance breastfeeding and maternal satisfaction. Education on how to develop confidence in performing these skills remains insufficient. This compels targeting outcomes that can ultimately improve maternal, infant and family health through expert nursing and healthcare support.

**Phone Call Support.** Dennis and Kingston (2008), in their systematic review of 14 studies involving 8,037 mothers found that telephone support was beneficial in enhancing breastfeeding duration and postnatal depression. It was recommended to use proactive (initiated by trained individuals) telephone calls than reactive (call in services via helplines) calls. It was emphasised that calls initiated by trained individuals such as midwives are more beneficial than someone inexperienced. The review found that duration, time and number of calls did not impact the outcomes but the focus should be on the recipient's

needs. The review recommended that telephone support could be a primary intervention or an adjunct to the multi-component intervention. There was a major issue with the methodological quality of some of the included studies, particularly the information on ensuring the standardisation in the delivery of telephone intervention and the evidence of intervention compliance were lacking in the reviewed papers. There were also issues with the randomisation process in some of these studies (Dennis & Kingston, 2008).

**Printed Educational Material Support.** Giguere et al. (2012) in their Cochrane review examined the effectiveness of support in the form of printed educational materials such as journal articles and clinical guidelines on professional practices and patient outcomes. The review involved 45 studies. It was highlighted that the printed educational materials when used alone in contrast to no intervention were effective in improving the professional practices such as patient assessments. However, no conclusion was drawn on the effectiveness of these materials on patient outcomes. The printed materials examined in this review were not easily accessible to the general public and their contents and language were difficult to comprehend by the general public that might explain the ineffectiveness of these printed materials on patient outcomes. In addition, the review examined printed educational materials as a single intervention and the authors recommended extending research by using printed educational materials as part of a multifaceted intervention.

Reich et al. (2011) examined the effectiveness of the educational booklet in enhancing safety practices among primiparas (n=167) in USA during the first 18 months postpartum. The contents of the booklet included various safety measures that mothers could use to avoid accidents at home. It was found that mothers who received the educational booklet had fewer risks and adopted more safety practices than the no-book group. Reich et al. (2011) highlighted that the use of the educational booklet was especially beneficial for consistent dissemination and retention of information after the early postpartum discharge. They also emphasised on the text that should be simple and comprehensible. In addition, the information in the booklet should be evidence based and up-to date. The booklet could also be brought home for

reinforcement of learning. However, all the primiparas in the study were unmarried and changed living arrangements often, limiting the generalisability to married Asian mothers.

**Peer Support.** Peer support has been studied to be beneficial in promoting exclusive breastfeeding (Hannula et al., 2008; Sikorski, Renfrew, Pindoria & Wade, 2003). The systematic review by Hannula et al. (2008) of 36 studies highlighted the importance of peer support in enhancing breastfeeding for primiparas. Hannula et al. (2008) concluded that mothers preferred peer support as they could relate to the other mothers. Consistently, Sikorski et al. (2003) examined 20 articles involving 2,712 mothers and found that support from non-professionals was effective in promoting exclusive breastfeeding without any formula feeding. The peer support in both systematic reviews involved varied means such as face-to-face discussions, phone follow-up, individual peer support and peer group support. Hence, it would be important to examine the effectiveness of distinct peer support approaches. It would also be crucial to examine the effectiveness of peer support in enhancing maternal confidence in various other newborn care tasks.

In summary, the reviewed studies suggested a need for future research that can overcome the methodological flaws of existing studies. Multi-modal interventions such as psychoeducation including home visits support, telephone calls and the educational booklet could be used and evaluated. It is equally important to consider all the components of functional support such as informational, instrumental, emotional, and appraisal and structural support both from significant others and health care professionals. The focus in the present literature remained either on breastfeeding or high-risk mothers such as depressed mothers. As highlighted by Whittaker and Cowly (2012), it is important to plan interventions for the mothers who are at low risk and are the receivers of general universal health care services. Such interventions could reach to the majority of the general population.



## Relationships among Self-efficacy, Social Support and Postnatal Depression

Previous studies found that self-efficacy and social support are positively correlated (Leahy-Warren & McCarthy, 2010; Mercer & Ferketich, 1995; Ngai et al., 2010) and social support and postnatal depression are negatively correlated (Beck, 2001; Boyce & Hickey, 2005; Davey et al., 2011; Dennis, & Ross, 2006). This implies that with adequate social support, self-efficacy could be enhanced and depressive symptoms could be reduced. Despite of well-defined relationships among self-efficacy, social support and postnatal depression, only a few researchers (Haslam et al., 2006; Leahy-Warren et al., 2011a,b) have included these three inter-related components together in one study in the early postpartum period.

Haslam et al. (2006) found that self-efficacy mediate the effects of social support on postnatal depressive symptoms. . The questionnaires were collected from 192 Australian primiparas at the fourth week postpartum. The results from the path analysis supported the mediation role of self-efficacy. Their findings suggest that social support of mothers lower their postnatal depression by enhancing maternal self-efficacy.

Leahy-Warren et al. (2011a) conducted a survey on 410 Irish first-time mothers using questionnaires of PMPS-E, EPDS and PICSS measuring maternal parental self-efficacy, postnatal depression and social support (both functional and structural). A correlational descriptive design was used. The researchers found significant relationships between both functional ( $r = -0.43$ ,  $p < 0.001$ ) and structural social support especially, the informal support ( $r = -0.21$ ,  $p < 0.001$ ) and postnatal depression at six weeks postpartum. They also found that postnatal depression and self-efficacy were significantly related to each other, and informal social support was positively correlated to self-efficacy ( $r = 0.21$ ,  $p < 0.001$ ). These findings clearly highlighted that self-efficacy; social support (both formal and informal) and postnatal depression were interdependent components.

Another study by Leahy-Warren et al. (2011b) examined the relationship among functional and structural social support and postnatal depression among 512 Irish primiparas at the 6 and 12 weeks postpartum. They found that both at 6 and 12 weeks, the total functional social support, that is, all the four dimensions (informational, instrumental, emotional and appraisal) of functional social support were independently associated with postnatal depression. The main source of structural social support was from husbands and maternal mothers. The use of a convenience sample was the main limitation of the study.

The evidence highlighted that future research could plan social support and self-efficacy enhancing interventions that could in turn reduce postnatal depression (Leahy-Warren et al., 2011a). Nurses and midwives need to be aware of the inter-relationships among self-efficacy, social support and postnatal depression (Haslam et al., 2006) so that substantial contributions of social support, particularly, from significant others can be used to positively enhance mental health and maternal parental self-efficacy (Leahy-Warren et al., 2011b).

### Research Gaps

The review of the literature shows the gap that the focus of researchers in maternal and child health nursing remained on pregnancy and childbirth. The limited focus on the postnatal period remained inclined mainly to breastfeeding and maternal satisfaction with the support provided. The review revealed that there are equally important postnatal outcomes such as self-efficacy, social support and postnatal depression that need the due consideration of adequate maternal adaptation to motherhood, for their newborn well-being and family functioning.

There are limited theory based interventions to provide support and enhance self-efficacy in the early postpartum period. The few conceptually sound interventions lack the standardised protocols, information on intervention dosage, implementation plans, and assurance of equal dose across conditions

and required training for the providers, though, the focus remains on antenatal education.

The main topics of education in the hospital or during home visits remained on what nurses/midwives feel mothers might need rather than evidence based and based on the mother's individual needs. This might be the reason that mothers felt unprepared and less confident in looking after their newborns in the early postpartum period. Also, the focus of education during home visits remained on knowledge and skills acquisition but not on the techniques of enhancing maternal parental self-efficacy in performing those skills. In addition, despite of the importance of informal support, the significant others such as husbands and mothers-in law have been often missed out in educational programmes.

The screening of postnatal depression is often delayed till four to six weeks postnatal (usually till the follow-up visit with the obstetrician). However, literature has divulged that mothers are prone to develop postnatal depression from as early as two weeks postpartum. Also, the focus of interventions to enhance maternal health remains on reducing postnatal depression and not preventing postnatal depression, which in turn, is necessary to reduce undue social burdens caused by depression.

The studies in the review also have limited methodological rigor. Most of the studies involve descriptive non-experimental methodology using different timelines in measuring outcomes, had small sample size with low response rate and high attrition rate. Among the few RCTs, the majority was only partially successful in proving a cause and effect relationship between the variables due to a lack of long term follow-up of participants, different timelines and non-valid tools used to measure the outcomes. In addition, the sample selection was often not randomised and information on participant's allocation concealments and blinding was often missing.

Specific to qualitative studies, due to their small sample size and the depth to which the explorations were conducted, findings may only be partially applicable to similar populations at best, due to cross-cultural differences. This

inherent characteristic of qualitative studies further limits their generalisability.

Most of the studies have been conducted in the Western context and very few have been conducted on mothers from Asian societies. As culture influences on postnatal recovery, it is important to conduct such studies in a multi-cultural Asian society.

### Theoretical Framework of the Study

Given that there is an association among self-efficacy, social support and postnatal depression and that maternal parental self-efficacy and social support have been found to play a significant role in perinatal health (Fisher et al., 2010; Ip et al., 2009; (Leahy-Warren et al., 2011a,b), Bandura's self-efficacy theory (1997) and social exchange theory (Blau, 1964, Homans, 1961) were selected to guide the theoretical framework for the present study.

Self-efficacy is a cognitive process by which one is able to evaluate their ability towards the performance of a given task (Bandura, 1997). In essence, it is not only the knowledge but also the perceived confidence required in performing any task. There are four factors that influence an individual's self-efficacy in a given realm of life. First is the personal mastery experience that provides confidence to repeat accomplishments in future, such as confidence in newborn care. This is one of the important sources of efficacy information as it is based on personal experience. Second is the vicarious experience, which enhances an observer's confidence when they observe others successfully, accomplishing a task. The potential for personal success enhances further especially when they observe others similar to themselves. Third, verbal persuasion involves verbal assurance by others that one can accomplish a task. Finally, the affective and physiological states of an individual provide the fourth source of efficacy information. Many researchers (Bandura, 1997; Cheal & Clemson, 2001) have endorsed that a combination of all the four sources which include health education, skills practice, and role modeling and self-affirming verbal persuasion with a special focus on an individual's emotional well-being produce the best effect.

Social support plays an important role in facilitating the smooth transition to motherhood (Wilkins, 2006) and is much needed by the women especially in the first two weeks of post delivery (Bennett & Tandy, 1998; Kapp, 1998). According to social exchange theory (Blau, 1964; Homans, 1961), social support entails networking that enables people to cope with stressful events. House (1981) defined social support as a combination of functional and structural support. Functional support comprises emotional support, instrumental support, informational support and appraisal support. Structural Support is further subdivided into formal support and informal support. Functional and structural supports are equally important and needed by the mothers (Leahy-Warren, 2005). The lack of support especially in terms of newborn care can cause undue stress for mothers which in-turn has profound effects on their functioning and psychological health making them more vulnerable to postnatal depression (Chan & Levy, 2004; Kapp, 1998).

In summary, maternal parental self-efficacy has been identified as a major determinant of competent parenting and newborn well-being, which in turn affects social support and postnatal depression. Hence, educating mothers through psychoeducation programmes will not only enhance maternal parental self-efficacy in newborn care but also social support (help seeking behaviour) and decrease postnatal depressive symptoms. Consequently, the Postnatal Psychoeducation Programme (PPP) was prepared incorporating all the four factors from self-efficacy theory (Bandura, 1997), both functional and structural social support from the social exchange theory (Blau, 1964; Homans, 1961) and postnatal depression as illustrated in Figure 1. It is aimed that PPP will provide the knowledge and skills to enhance maternal parental self-efficacy and social support and reduce postnatal depressive symptoms.

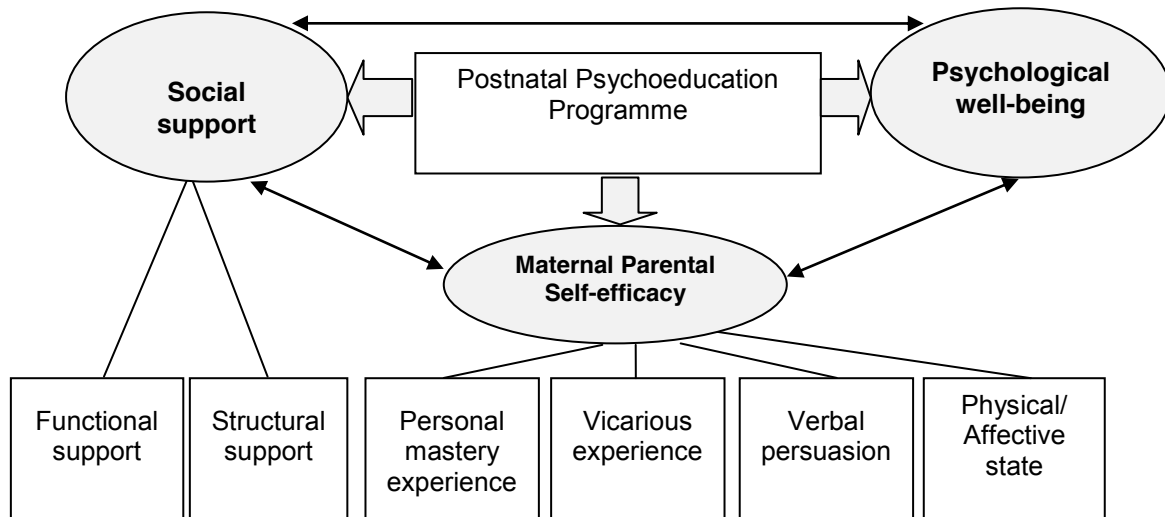


Figure 1. Theoretical framework

### Summary

This chapter provides a literature review on the postnatal period and the three important components necessary for the smooth transition to motherhood including maternal parental self-efficacy, social support and postnatal depression. The knowledge gaps in the existing literature have been highlighted. The potential use of Bandura's self-efficacy theory and social exchange theory in planning an educational programme in the early postpartum period has been discussed.

The postnatal period is a stressful transition period for mothers and has profound effects on the well-being of mothers, their newborns and the entire family. The mothers, especially first-time mothers face various emotional and physical challenges during this period. The lack of support due to the early postnatal discharge from the hospital aggravates the situation further. Mothers have lots of confusion and lack of knowledge on various newborn care tasks. This has led to increased dissatisfaction and lack of self-efficacy hampering the maternal adaptation further. Both the mothers and their families welcome the continuity of care in terms of postnatal home visits and verbalised the need of informational support in the form of educational booklets for reinforcement and phone follow-up in the absence of health care professionals.

The home visits have enhanced their satisfaction and self-efficacy in newborn care. The maternal parental self-efficacy is specifically crucial for maternal adaptation to motherhood, newborn psychosocial development and family functioning. Bandura's self-efficacy theory has been successful in enhancing maternal self-efficacy in breastfeeding and childbirth and thus can be used in the early postpartum period. Self-efficacy is inter-related to social support and postnatal depression. According to the social exchange theory, both formal and informal support is important in enhancing self-efficacy and reducing postnatal depression. The psychoeducation to prevent postnatal depression has been particularly successful as it requires minimum training on the part of midwives and can be easily delivered to the mothers. Thus, the theory based psychoeducation including multi-modal interventions focusing on all the three interdependent components especially in the early postnatal period are important for maternal and their newborn's psychosocial well-being.

Although the literature has concluded that motherhood is associated with high levels of stress, lack of social support and low self-efficacy as well as depression, the multi-modal psychoeducation programme can provide adequate support and personal resource with enhanced self-efficacy and emotional well-being. However, there has been no known evaluation of such educational programme in the early postpartum period using self-efficacy and social exchange theory as its framework in examining its impact on self-efficacy, social support and postnatal depression. Therefore, the aim of this study was to evaluate the effectiveness of a postnatal psychoeducational programme based on Bandura's self-efficacy and social exchange theory in enhancing maternal parental self-efficacy in newborn care, social support and preventing postpartum depression symptoms among multi-racial Singaporean first-time mothers.

## DEFINITION OF TERMS

### Maternal Parental Self-efficacy

The maternal parental self-efficacy (MPSE) is defined as new mother's judgment of her capabilities to execute infant care skills which is important in facilitating adaptation to motherhood (Haslam et al., 2006; Leahy-Warren et al., 2011a; Montigny & Lacharite, 2005). MPSE is measured by the domain specific Perceived Maternal Parental Self-Efficacy (PMP S-E) scale (Barnes & Adamson-Macedo, 2007), which focus on specific newborn care tasks in the early postpartum period.

### Social Support

Social support refers to the networking between people that enable them to cope with stressful life events. House (1981) defines social support as a combination of structural support and functional support. The structural element of social support refers to the sources of support available and the functional elements of social support consist of types of exchange activities that take place within individuals including emotional support, instrumental support, informational support and appraisal support (House, 1981). Social support is measured as the sum of both structural and functional support subscales of the Perinatal Infant Care Social Support (PICSS) scale (Leahy-Warren, 2005).

### Postnatal Depression

Postnatal depression refers to the non-psychotic depressive episode of a dysphoric mood along with several other symptoms such as sleep disturbances, poor concentration and fatigue, loss of appetite, excessive guilt and suicidal thoughts in the postpartum period (Cox et al., 1993). The criteria to diagnose postnatal depression include the presence of aforementioned symptoms for at least two weeks that leads to the functional impairment (American Psychiatric Association, 2000). The sum of scored responses on Edinburgh Postnatal Depression Scale (EPDS) is used to measure the postnatal depression (Cox et al., 1987).



## CHAPTER 3 PHASE I OF THE STUDY

### Introduction

This chapter reports the results of Phase I study. The objectives of Phase I study were to validate the two instruments including the Perceived Maternal Parental Self-efficacy (PMPS-E) scale and Perinatal Infant Care Social Support (PICSS) scale. These two instruments were used as outcome measures in Phase II study. The PMPS-E and PICSS were developed in the years 2005 and 2007 respectively and were originally tested on mothers in United Kingdom (UK) and Ireland respectively. Though these instruments are widely used and tested in many other countries, it is necessary to test the validity and reliability of both instruments among multi-racial Singaporean mothers. A rigorous validation process is important to establish cross-cultural equivalence of concepts for reliable and valid measurements in different cultures as it will enhance the credibility of research findings (Portney & Watkins, 2000).

This chapter presents the methods and findings of Phase I study followed by the discussion on the findings. Given the importance of maternal parental self-efficacy and social support on maternal and newborn well-being, it is important to have a psychometrically sound instrument to assess these maternal outcomes so that the effectiveness of the interventions that foster maternal parental self-efficacy and social support can be developed and evaluated. The PMPS-E and PICSS are theoretical

framework based instruments that have been robustly tested for a number of psychometric properties such as internal and external reliability, face and content validity among Caucasian mothers (Barnes & Adamson-Macedo, 2007; Leahy-Warren, 2005).

The PMPS-E, a domain specific instrument (Appendix 1) was developed based on Bandura's self-efficacy theory by Barnes and Adamson-Macedo (2007) in UK. It comprises 20 items to measure MPSE on a single domain of newborn care tasks in the early postpartum period. Sample items on the scale

are: “I am good at feeding my baby” and “I can tell when my baby is sick”. The PMP S-E has demonstrated sound psychometric properties (Barnes & Adamson-Macedo, 2007; Leahy-Warren et al., 2011a).

The PICSS was developed by Leahy-Warren (2005) based on the social exchange theory (Blau, 1964; Homans, 1961) where the social support was defined using House’s (1981) definition of a combination of both the functional (Appendix 2a) and structural social support (Appendix 2b). Hence, the PICSS assesses both the social support types including informational, instrumental, emotional and appraisal as well as sources of support from both the health care professionals and significant others. Examples of items on the functional social support informational sub-scale was, “I get information on infant: feeding, changing/dressing, comfort/settling, and bathing”; on instrumental sub-scale was, “I have someone to help me with routine housework”; for the emotional sub-scale was, “I have someone to care and comfort me”; and appraisal sub-scale was, “I get positive feedback from professionals about the care I give my baby”. For the structural social support, all four types of functional social support were assessed to have been received from health professionals such as nurse/midwives and doctors as well as from significant others including husbands, parents and parents-in law. The PICSS has demonstrated sound psychometric properties (Leahy-Warren, 2005; Leahy-Warren et al., 2011a).

The PMPS-E and PICSS have never been used in the Singapore context to assess the maternal parental self-efficacy and social support among multi-racial mothers. However, the validation of tools is essential before its adaptation for cross-cultural use. Especially, the validity and reliability are the two most important and fundamental characteristics of any measuring instrument (Nunnally & Bernstein, 1994).

## Aim of the Phase I Study

To examine the validity and reliability of PMPS-E and PICSS in multi-racial mothers in Singapore

## Methods

### Design

A cross-sectional descriptive study was conducted to test the validity and reliability of two instruments of PMPS-E and PICSS.

### Study Settings

The study was conducted in a tertiary public hospital where the annual birth rate is approximately 3,000. Mothers usually stay in the hospital's postnatal wards for an average of one to three days post delivery depending on the type of delivery and their health conditions.

### Sample Size

The sample size was estimated using findings from a previous study that reported on the correlation between MPSE and social support (Leahy-Warren *et al.* 2011a). An effect size of 0.21 was documented. With such a small effect size, an 80% power level and a significance level of 0.05 (2-sided), a minimum sample size of 199 was required (Cohen, 1992). Two hundred and four participants were recruited in this study.

### Sampling Criteria

The sampling criteria comprised the list of characteristics that are essential for eligibility to be classified as a member of the specified population (Polit & Beck, 2006). The inclusion criteria were both primiparas and multiparas who: (1) were 21 years old and above; (2) had delivered a baby regardless of the mode of delivery in the hospital; and (3) were able to read and write in English. The exclusion criteria included mothers who: (1) had a cognitive

impairment as identified from their medical records; (2) had severe antepartum, intra-partum or postpartum maternal complications such as postnatal haemorrhage or pregnancy-induced hypertension; (3) had delivered a baby with apparent congenital anomalies or delivered stillbirth; and/or (4) had a baby who was not simultaneously admitted to the postnatal ward. Both primiparas and multiparas were recruited in phase I study so that these instruments could be used for various groups of mothers in Singapore in the future.

### Sampling Method

Purposive sampling was used to recruit participants who meet the selection criteria between March and June 2012. This is to ensure the best possible variety of respondent candidates to provide relevant information (Polit & Beck, 2006). Of the 210 postnatal mothers who were approached, 204 agreed to participate in the study, resulting in a response rate of 97%. Those who refused to participate in the study cited reasons such as inconvenience and lack of time due to the presence of visitors. Among the 204 mothers who completed the questionnaires survey, 20 were approached to fill in the same questionnaires two weeks later to establish test-retest reliability.

### Study Instruments

**Perceived Maternal Parental Self-efficacy (PMP S-E) Scale.** The modified PMPS-E Scale (Barnes & Adamson-Macedo, 2007) was used to measure maternal parental self-efficacy in newborn care (Appendix 3). The original PMP S-E scale contained 20 items. After a review by an expert panel, three items were removed due to repetition. The modified scale consisted of 17 items, and each item was rated on a 4-point likert scale: 1 = 'strongly disagree', 2 = 'disagree', 3 = 'agree' and 4 = 'strongly agree'. The total score of the PMP S-E Scale ranged from 17 to 68, with higher scores representing higher self-efficacy in newborn care. The Cronbach's alpha values were 0.91 in the previous study (Barnes & Adamson-Macedo, 2007).

Perinatal Infant Care Social Support (PICSS) Scale. The modified PICSS Scale was used to measure mothers' functional and structural social support. The functional support scale contained 22 items, including informational and instrumental support sub-scales (seven items each) and emotional and appraisal support sub-scales (four items each). Each item was rated on a 4-point Likert scale with 1 = 'strongly disagree', 2 = 'disagree', 3 = 'agree' and 4 = 'strongly agree'. A total functional social support score (ranging between 22 and 88) and the scores of four subscales were calculated. The informational and instrumental subscale scores ranged from 7 to 28 and the emotional and appraisal subscale scores ranged from 4 to 16 (Appendix 4a).

The structural social support scale included nine items that identified the individuals who provided support to mothers. Structural social support from both formal (including nurses/midwives, doctors and confinement nannies) and informal (including husband/partner, maternal parents, parents-in-law, siblings, friends and neighbour) sources was considered. Participants responded on whether they received informational, instrumental and emotional or appraisal support from any of the aforementioned sources. Originally the structural social support scale also included the information on length of time and the frequency of contacts with the sources of support, however after the face validity these two items were removed. The modified structural social support scores ranged between 0 and 36. Participants were considered to have received formal and/or informal structural supports if they confirmed to receiving any of the four support types. Each affirmative answer scored one point, and the number of affirmative answers was equated to the total score on the structural support scale. A score of 0 meant that both informal and formal structural supports were absent from all four functional subscales. A score of 36 meant that structural support was available on all four functional subscales from all nine informal and formal sources. The original PICSS Scale showed good reliability, with a Cronbach's alpha of 0.80 in the previous study (Leahy-Warren *et al.* 2011a) (Appendix 4b).

**Demographic Data.** A background information sheet was used to obtain the mothers' demographic and obstetric information such as their age, education levels, types of delivery and parities (Appendix 5).

### Data collection procedure

After receiving ethical approval from the participating hospital, the doctor-in-charge granted permission to explore the mothers' case notes and create a shortlist of those who met the eligibility criteria. The nurse-in-charge of the mothers was also approached to ascertain the mothers' physical and emotional well-being. The mothers were then approached at the postnatal wards on their days of discharge. After written consent (Appendix 6) was obtained, the mothers were asked to fill in the self-report instruments including PMPS-E and PICSS. The whole process took about 30 minutes.

### Ethical considerations

The ethics committee of the participating hospital approved the study (Appendix 7). Each participant was provided with a participant information sheet (Appendix 8), and the researcher explained the aims of the study, requirements, possible risks and benefits and participants' rights to each mother. Written consent was obtained from all of the participants. The mothers were assured that their participation was voluntary and that they had the right to withdraw from the study at any time without any harm or disruption in the routine care they would receive. They were provided ample time to discuss any issues or questions. The confidentiality of the data was assured.

### Data Analysis

Statistical Package for Social Sciences (SPSS) for Windows version 20.0 (SPSS Inc., Chicago, IL, USA) was used to analyse the data. Descriptive statistics were used to summarise the socio-demographics, maternal parental self-efficacy and social support. The scores of modified PMPS-E and PICSS scales were assessed for normality by inspecting the shape of the distribution

as well as statistical values of skewness and kurtosis (Tabachnick & Fidell, 2007). A value of zero represents a symmetric and evenly balanced distribution as well as a shape close to normal (George & Mallery, 2006). A reasonably straight diagonal line was observed in the normal Q-Q plots of PMPS-E (Figure 2) and PICSS (Figure 3) suggesting a normal distribution of each variable (Pallant, 2007).

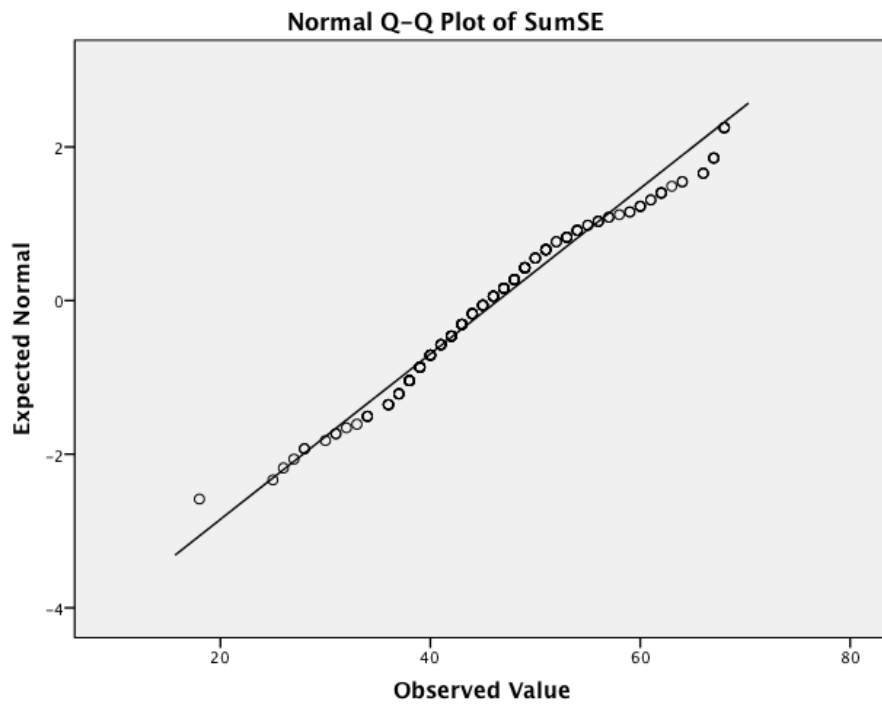


Figure 2. Normal QQ plot of PMPS-E score

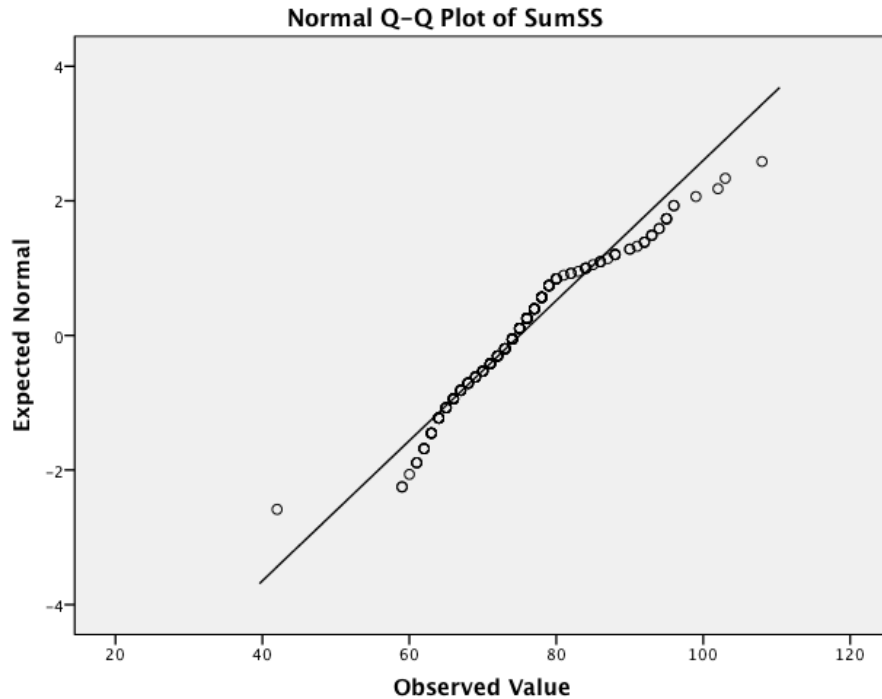


Figure 3. Normal QQ plot of PICSS score

The skewness and kurtosis values for the PMPS-E and PICSS were all within the recommended range of -1.96 and + 1.96, suggesting no violation of the assumption of normal distribution (Table 1) (George & Mallery, 2006).

Table 1. Skewness and Kurtosis values of PMPS-E and PICSS

Variables	Skewness		Kurtosis	
	Statistic	Std. Error	Statistic	Std. Error
PMPS-E	.311	.170	.292	.339
PICSS	.635	.170	1.09	.339

### Validity

The validity of PMPS-E and PICSS was evaluated by face and content validity. Factor analysis was not performed as these instruments have been widely tested for their psychometric properties in other countries on varied populations (Barnes & Adamson-Macedo, 2007, Leahy-Warren 2005, Leahy-Warren et al., 2011a; Tarkka et al., 2000). Also, the same English versions of the instruments were used in this study. Hence, evaluating the face and content



validity of these instruments was deemed sufficient for their adaptation to cross-cultural usage.

**Face Validity.** It is an estimate of whether an instrument appears to be valid at their “face-value”. In this study, a team of experts and amateurs including two obstetricians, two midwives, two primiparas and two multiparas were invited to examine if the two instruments PMPS-E and PICSS measure the specific criterion including maternal parental self-efficacy and social support. However, face validity is considered insufficient and requires more solid validity criteria to enable acceptable conclusions to be drawn (Portney & Watkins, 2000). As such, content validity was also considered to validate the instrument.

**Content Validity.** The content validity assures that each item in the instrument has consistent cultural and content relevance (Flaherty et al., 1988). The content validity is a subjective process, and a panel of experts normally does it. These experts review the instruments and determine if the items in the instrument satisfy the content domain (Portney & Watkins, 2000). In this study, the expert panel comprised 10 experts (including four midwives, three obstetricians, and three academics: one professor trained in mental health and two professors trained in maternal and child health nursing). Experts in the panel were asked to rate independently the relevance of the content of the PMPS-E items measuring maternal parental self-efficacy to the local Singapore culture and PICSS items measuring social support by using a 4-point scale Content Validity Index (CVI). The scale comprised: 4 = very relevant, 3 = relevant, 2 = somewhat relevant and requires modifications and 1 = not relevant (Appendix 9). They were also asked to write comments on those items that were rated as 1 or 2. The CVI was calculated using the average percentage of total items rated by the 10 experts as either 3 or 4. According to the size of the panel, a CVI score of 0.8 or higher was considered to have good content validity (Polit & Beck, 2006).

## Reliability

The internal consistency reliability and test-retest reliability were examined for the PMPS-E and PICSS.

**Internal Consistency Reliability.** It gives an estimate of the equivalence of sets of items for the same instrument. The coefficient of internal consistency provides an estimate of the reliability of measurement and is based on the assumption that items measuring the same construct should correlate. The most widely used method for estimating internal consistency reliability is Cronbach's alpha (Nunnally & Bernstein, 1994). Cronbach's alpha is a function of the average inter-correlations of items and the number of items in the scale. Cronbach's alpha coefficient greater than 0.7, is considered acceptable (Portney & Watkins, 2000).

**Test-retest Reliability.** It is one of the best ways of testing the stability and precision of measurement of an instrument over time. It involves repeating the measurement process on the same subjects, under conditions as similar as possible, and comparing the observations. As MPSE evolves over time (Ngai et al., 2009) a short two weeks interval was used for test-retest reliability for both PMPS-E and PICSS scales. Intra class coefficient (ICC) was used to test the correlations between the initial and two-weeks follow-up data collection. An ICC above 0.75 indicates good test-retest reliability (Nunnally & Bernstein, 1994).

## Results

### Sample Characteristics

As shown in Table 2, the mothers' age ranged from 21 to 41 years old (mean = 30, SD = 4.62). The majority were Chinese (n = 82, 40%), married (n = 197, 97%) and had a monthly household income of more than S\$3,000 (US\$2,500) (n = 145, 71%). More than half of them had a university degree or above (n = 115, 56%), were employed (n = 104, 51%) and were primiparas (n = 104, 51%). Less than one fifth of the mothers (n = 29, 14%) attended antenatal

classes. More than two thirds of the mothers (n=144, 71%) had undergone a normal vaginal delivery and almost half of the mothers were primiparas.

Table 2. Demographic characteristics of the participants (n = 204)

Demographics	Frequency (n)	Percentage (%)
Age		
Range, M (SD)	21-4, 30(4.6)	
Ethnicity		
Chinese	82	40
Malay	40	20
Indian	50	25
Others	32	15
Marital status		
Married	197	97
Single	7	3
Highest education level		
Primary or secondary	38	19
ITE/Polytechnic/ Junior college	51	25
University	115	56
Employed		
Yes	104	51
No	100	49
Monthly household income		
<S\$3,000	59	29
>=S\$3,000	145	71
Attending antenatal classes		
Yes	29	14
No	175	86
Type of birth		
Vaginal delivery	144	71
Caesarean section	60	29
Parity		
First child	104	51
More than one child	100	49

## Validity

**PMPS-E Scale.** All the six members of the panel examining face validity, reported item 7, “I am good at soothing my baby when he/she becomes upset”, item 8, “I am good at soothing my baby when he/she becomes fussy” and item 9, “I am good at soothing my baby when he/she is continually crying” having low face validity. The panel suggested to remove these items due to their repetition and as other items such as item 6, “I can make my baby calm when he/she has been crying” and item 10, “I am good at soothing my baby when he/she becomes more restless” had a similar meaning and covered the same content. Hence, the three items were removed and the modified 17-items PMPS-E scale was then used to test the content validity. The expert panel opined that all the 17 items are culturally relevant for the multi-racial Singapore society. All the members of the panel rated all 17 items as very relevant or relevant in content base. The CVI of the final modified PMPS-E with 17 items was 0.8 indicating a good content validity.

**PICSS Scale.** All the 22 items of functional social support were found relevant and valid by the panel considering the face validity of PICSS. However, for the structural social support scale, the two types of support including, “The length I have got to know this person,” and “The frequency I have contact with this person,” from different sources of support were found irrelevant by all the six members considering the face validity and hence were removed. Another expert panel performing the content validation opined that all the items in the functional social support and the modified structural social support are culturally and content wise relevant for the local multi-racial mothers in Singapore. All the items were rated as ‘very relevant’ to ‘relevant’ with the index value of 0.9, which indicate a good content validity.

## Reliability

PMPS-E Scale. Cronbach's alpha for the PMPS-E scale was 0.95, which indicated good internal consistency. The correlation coefficients between items and the remainder of their own scale ranged between 0.40-0.80 (Table 3), providing evidence of good internal consistency. In addition, the Cronbach's alpha values were also calculated separately for the primiparas (0.89) and multiparas (0.93), which indicated that the internal consistency was good for both groups of mothers. The ICC for the PMPS-E scale was 0.93, indicating a high stability of PMPS-E over a two weeks period.

Table 3. Internal Consistency (item-to-total correlation, Cronbach's alpha and inter class correlation) of PMPS-E (n = 204)

Items	Item-to-total correlations (n=204)	Cronbach's $\alpha$ (n=204)	ICC <sup>#</sup>
PMPS-E scale		0.95	0.93
I am good at feeding my baby	0.71		
I am good at changing my baby	0.77		
I am good at bathing my baby	0.72		
I can make my baby happy	0.76		
I can make my baby calm when he/she cries	0.80		
I am good at soothing my baby when he/she becomes more restless	0.73		
I am good at getting my baby's attention	0.71		
I believe I can tell when my baby is tired and needs to sleep	0.75		
I believe I have control over my baby	0.74		
I can tell when my baby is sick	0.77		
I can read my baby's cues	0.70		
I am good at understanding what my baby wants	0.77		
I am good at keeping my baby occupied	0.79		
I am good at knowing what activities my baby does not enjoy	0.74		
I believe my baby responds well to me	0.55		
I believe that my baby and I have a good interaction with each other	0.50		
I can show affection to my baby	0.40		

<sup>#</sup> ICC = Intra Class Correlation Coefficient

**PICSS Scale.** The Cronbach's alpha value for the overall PICSS scale was 0.86 with 0.76 for the functional social support and 0.80 for the structural social support scale indicating acceptable internal consistency. For the subscales of functional social support the Cronbach's alpha values were: 0.81 (Informational), 0.69 (Instrumental), 0.91 (Emotional) and 0.66 (Appraisal). For the subscales of structural social support the Cronbach's alpha values were 0.77 (Informal) and 0.75 (Formal). The correlation coefficients between the items and remainder of their own scale were ranged from 0.2-0.6 for the functional social support scale (Table 4) and 0.1-0.5 (Table 5) for the structural social support scale. In addition, the Cronbach's alpha values were also calculated separately for the primiparas (0.84) and multiparas (0.883), which indicated that the internal consistency was good for both groups of mothers. The ICC for the functional and structural social support was 0.96 and 0.98 with a total PICSS scale ICC was 0.97, indicating a high stability of PICSS over a two weeks period.

Table 4. Internal consistency (item-to-total correlation, Cronbach's alpha and inter class correlation) of PICSS-Functional Social Support Scale (n = 204)

Sub-Scales	Items	Item-to-total correlations (n=204)	Cronbach Alpha (n=204)	ICC <sup>#</sup> (n=204)
PICSS-Functional Social Support Scale			0.76	0.96
Informational Support	I get information on:		0.81	
	a. feeding	0.58		
	b. changing/dressing	0.55		
	c. comfort/settling	0.54		
	d. bathing	0.52		
	I get information on taking care of my body after childbirth	0.36		
	I learn from other mother's experiences	0.33		
	I get consistent information regarding infant care	0.52		
Instrumental Support	I get hands on help with infant:		0.69	
	a. feeding	0.57		
	b. changing/dressing	0.56		
	c. comfort/settling	0.54		
	d. bathing	0.49		
	I have someone to help me with routine housework	0.47		
	I am not on my own in taking care of the baby	0.49		
I have time for myself	0.41			
Emotional Support	I have people to count on when things go wrong	0.50	0.91	
	I have someone to care and comfort me	0.54		
	I have someone to talk to about the way I am feeling	0.55		
	If I need advise there is someone who will assist me to work out a plan for dealing with the situation	0.55		
Appraisal Support	I have people to talk to and share my experiences with	0.58	0.66	
	I am shown appreciation for the care I give my baby	0.38		
	People close to me understand that it is okay for me to need help	0.54		
	I get positive feedback from professionals about the care I give to my baby	0.40		

<sup>#</sup> ICC = Intra Class Correlation Coefficient

Table 5. Internal consistency (item-to-total correlation, Cronbach's alpha and interclass correlation) of PICSS-Structural Social Support Scale (n = 204)

Sub-Scales	Sources of Support	Items	Item-to-total correlations (n=204)	Cronbach alpha (n=204)	ICC
PICSS- Structural Social Support Scale				0.80	0.98
Informal Support	Husband	Informational Support	0.20	0.77	
		Instrumental Support	0.24		
		Emotional Support	0.45		
		Appraisal Support	0.85		
	Parents	Informational Support	0.42		
		Instrumental Support	0.47		
		Emotional Support	0.58		
		Appraisal Support	0.43		
	Parents-in law	Informational Support	0.47		
		Instrumental Support	0.40		
		Emotional Support	0.71		
		Appraisal Support	0.54		
	Siblings	Informational Support	0.34		
		Instrumental Support	0.45		
		Emotional Support	0.65		
		Appraisal Support	0.40		
	Friends	Informational Support	0.50		
		Instrumental Support	0.40		
		Emotional Support	0.70		
		Appraisal Support	0.45		
Neighbors	Informational Support	0.24			
	Instrumental Support	0.20			
	Emotional Support	0.51			
	Appraisal Support	0.20			
Formal Support	Nurse/ Midwives	Informational Support	0.56	0.75	
		Instrumental Support	0.47		
		Emotional Support	0.50		
		Appraisal Support	0.20		
	Doctors	Informational Support	0.57		
		Instrumental Support	0.48		
		Emotional Support	0.47		
		Appraisal Support	0.21		
	Others, Please specify	Informational Support	0.10		
		Instrumental Support	0.22		
		Emotional Support	0.21		
		Appraisal Support	0.10		



## Discussion

To our knowledge, this is the first attempt of evaluating the validity and reliability of PMPS-E and PICSS scales among multi-racial primiparas and multiparas in Singapore. Participants in this study had a mean age of 30 years, which is similar to the childbearing age of women in Singapore (Mean = 29.8) (Singapore Department of Statistics, 2012). The majority of them were Chinese (40%), followed by Indians (25%), Malays (20%) and the other races (15%). In Singapore, among the general population, the dominant ethnic group is Chinese though the difference between the Chinese and the other races is significantly large (Chinese 76.8%, Malay 13.9%, Indian 7.9%, other 1.4%) (Singapore Department of Statistics, 2012) which may not be a true representation as depicted in the figures above in this study. The most possible reason was that the study only recruited mothers who could speak and write in English.

Eighty percent of the participants in this study had secondary or higher qualifications, which is comparatively higher than the educational level of the general population in this age group (around 63.7% completed secondary or higher education) (Singapore Department of Statistics, 2012). Approximately 50% of the participants were employed which is similar to the labor force participation rate in the female population aged 15 and over in 2011 (57.7%) (Singapore Department of Statistics, 2012). The mean household income was S\$3000 (US\$2500) and above among 71% of the participants which is similar to the mean household income in the general population in 2011 (S\$ 7,500 = US\$ 5000) (Singapore Department of Statistics, 2012). Most of the participants (80%) did not attend antenatal classes and majority of them had normal vaginal deliveries. Nearly half of the participants had their first baby. Hence, the study sample showed that the majority of the participants in this study were well educated, employed and belonged to higher income group who did not attend the antenatal classes.

Based on the face validity by the review panel, three items were removed from the original 20 items in the PMPS-E scale due to their repetition. The modified 17 items PMPS-E scale was then tested for the content validity, internal consistency and test-retest reliability. The structural social support from the PICSS was modified to 36 items due to the irrelevance of two items. The PICSS original functional support scale (22 items) and the modified structural support scale were tested for their content validity and reliability.

Both PMPS-E and PICSS are valid instruments as indicated by a high CVI of 0.8 and 0.9 respectively (Norwood, 2000). The face and content validation by the experts with high CVI authenticates the cross-cultural equivalence of PMPS-E and PICSS scales (Portney & Watkins, 2000). The reliability tests demonstrated that the PMPS-E and PICSS are the reliable instruments for assessing the maternal parental self-efficacy and social support among multi-racial mothers. Both instruments have good internal consistency, with Cronbach's alpha exceeding the criteria of 0.7 for the total PMPS-E and PICSS scales. The Cronbach's alpha coefficient greater than 0.70 is recommended for the new instruments (Portney & Watkins, 2000). The Cronach's alpha values for both instruments in this study are similar with the previously reported values in the previous studies (Barnes & Adamson-Macedo, 2007; Leahy-Warren, 2005), which confirm the consistency of the instruments when used in Singapore population. In addition, the high ICCs for the total PMPS-E and PICSS scales and subscales demonstrated a strong stability of these instruments over time. According to Nunnally and Bernstein (1994), high ICC is a good indicator for the reliability of the instrument.

There was moderate to high correlations of items with their own scale total further supported the internal consistency of the PMPS-E scale. For the PICSS scale, there was weak to high correlations of items with their own scale total both for functional and structural social support scales. The items with weak correlations can be removed from the original scale; however they were remained in the scale in this study due to the following reasons: firstly these items were found to be relevant in terms of content and cultural point of view by the expert panel and mothers during the face and content validity stage.

Secondly, the Cronbach's alpha of the PICSS total scale did not increase when these items were deleted highlighting the satisfactory degree of homogeneity in the instrument (Nunnally & Bernstein, 1994).

In conclusion, the PMPS-E and PICSS are the user-friendly instruments in terms of short completion time. The empirical findings supported that the tools are reliable and valid to be used to assess the MPSE and social support among multi-racial mothers in Singapore. The strength of this study includes a large sample size, though; the geographical restriction of the sample limits its generalisability. Because the validation is a continuous process, thus, further evaluation of the psychometric properties of PMPS-E and PICSS especially factor analysis should be explored in diverse population groups including, single mothers belonging to low income groups with different modes of deliveries.

### Summary

The PMPS-E and PICSS are the reliable and valid instruments that could be used by midwives in the clinical context for evaluating and understanding the maternal parental self-efficacy and social support needs of new mothers. Specifically, by understanding maternal needs, midwives could assess mothers who are at risk and plan individualised care for them. In addition, the tools could be useful in the design and evaluation of culturally competent interventions that foster maternal parental self-efficacy and social support. Interventions strategies such as more hands on opportunities, especially for primiparas, feedbacks on their performances and adequate social support particularly in the early postpartum period could be planned to facilitate a smooth transition to motherhood. This will in turn enhance maternal and newborn well-being. The PMPS-E scale and PICSS were adopted in the Phase II of the study to evaluate the effectiveness of the postnatal psychoeducation programme on maternal parental self-efficacy and social support in the early postpartum period. The good reliability and validity of the instruments would serve as an important function of assuring that the study findings are reliable and valid.

## CHAPTER 4 PHASE II METHODOLOGY

### Introduction

This chapter discusses the methodology of the Phase II intervention study. It comprises the aims, objectives, and hypotheses, research design, followed by sampling strategies. The details of the postnatal psychoeducation programme (PPP), instruments used in the study and process of data collection will be presented. Ethical considerations and methods of data analysis are justified. Finally a summary of the methodology concludes this chapter.

### Aims

The aims of this study were to evaluate the effectiveness of a PPP on improving maternal parental self-efficacy in newborn care, social support received and reducing postnatal depressive symptoms among first-time mothers. In addition, mothers' satisfaction with PPP was also explored.

### Objectives

The objectives of the study were to:

- (1) examine first-time mothers' maternal parental self-efficacy in newborn care, social support received and postnatal depression at three time points (baseline, posttest-1 and posttest-2);
- (2) examine the relationships among the three outcome variables and the differences of these variables between/among mothers' demographic and clinical subgroups using the baseline data;
- (3) examine the differences of maternal parental self-efficacy, social support and postnatal depression among first-time mothers between the intervention and control groups over time (baseline, posttest-1, posttest2);
- (4) examine the differences of maternal parental self-efficacy, social support and postnatal depression among first-time mothers between intervention and control groups at posttest-1 and posttest2;

- (5) examine the differences of the satisfaction level of mothers from intervention and control groups; and
- (6) explore mothers' perceptions of the PPP.

### Hypotheses

When compared with the control group, mothers in the intervention group would have statistically significant:

1. improved composite outcomes of maternal parental self-efficacy, social support and postnatal depression between groups over time (baseline, posttest-1 and posttest-2).
2. enhanced maternal parental self-efficacy between groups over time (baseline, posttest-1 and posttest-2).
3. enhanced social support across the three time periods (baseline, posttest-1 and posttest-2).
4. reduced postnatal depression across the three time periods (baseline, posttest-1 and posttest-2).
5. improved maternal parental self-efficacy, social support, and reduced postnatal depression at six weeks postpartum (posttest-1).
6. improved maternal parental self-efficacy, social support, and reduced postnatal depression at 12 weeks postpartum (posttest-2).
7. There will be statistically significant difference in the satisfaction level among first time mothers who receive PPP and postnatal routine care and those only receiving the postnatal routine care.

### Design

A randomised controlled two-group pre-test and repeated posttest design was used to investigate the immediate (6 weeks postpartum) and long-term (3 months postpartum) effects of PPP on outcomes including maternal parental self-efficacy in newborn care, social support and postnatal depressive symptoms. Randomised Controlled Trial (RCT) used in this study is considered one of the most powerful methods of testing cause and effect relationships between variables (Munro, 2005; Portney & Watkins, 2000).

This RCT involved the delivery of PPP to first-time mothers and then observed its effects on variables of maternal parental self-efficacy, social support and postnatal depression at repeated time points. It also included a control group receiving the routine postnatal supportive care where participants in the intervention and control groups were placed at random. Randomisation allows every participant to have an equal chance of being included in any group. It also implies that there is no systematic bias in the groups with respect to their attributes and any differences between the groups can be deduced as a result of intervention (Polit & Beck, 2006; Portney & Watkins, 2000). The control group further dissipates the effects of any extraneous variables and increases the internal validity of the study (Portney & Watkins, 2000). The baseline data from both the control and intervention group facilitate the researcher to test the assumption of initial equivalence between the groups (Polit & Beck, 2006). Thus, the use of interventional and control groups, randomisation and use of repeated measures of outcomes contribute to the strength of the study and to the rigorous control of the internal validity of the study. The diagrammatic representation of the design for the intervention study is represented in Table 6.

Table 6. Diagrammatic representation of the design of the study

Groups	Baseline	Intervention	Posttest-1 (6 weeks postpartum)	Posttest-2 (12 weeks postpartum)	Process Evaluation
Intervention	X	PPP <sup>1</sup> + Routine Care	X	X	X
Control	X	Routine Care	X	X	

<sup>1</sup> PPP= Postnatal Psychoeducation Programme; X = Data Collection

## Study Setting

The study was conducted in a university affiliated 991-bed tertiary public hospital located in a central region in Singapore. It serves about two million people who reside in the western and central parts of Singapore (National University Hospital, 2012). The delivery rate in the hospital is approximately 3000 births per year. After childbirth, mothers spend an average of two hours in the delivery suite before being transferred to postnatal wards. They can choose to stay in any one of the four classes of the postnatal wards such as A, B1, B2 and C. Classes A and B1 are considered private wards while the Classes B2 and C are subsidised wards. Class 'A' being the most expensive and Class C being the cheapest. The reason for different charges among the four classes of wards is due to differing amenities and government subsidies available in these wards. Depending on the ward they choose, the mothers stay on an average of 2-3 days in the postnatal wards depending on the type of delivery, mother's conditions and obstetrician's decision before being discharged from the hospital. The early discharge leads to lack of opportunities for health professionals to provide adequate support and education to the new mothers (Kapp, 1998).

## Sample

### Sampling Method

The participants were recruited on the day of discharge from both the private and subsidised postnatal wards. All the first-time mothers who delivered and were admitted to the postnatal wards and had met the selection criteria were invited to participate in the study. The inclusion criteria for participants were first-time mothers who were:

(1) 21 years old and above; and (2) able to read and speak English.

The exclusion criteria for participants were first-time mothers who:

(1) had medical and psychiatric history (including perinatal depression) before and during pregnancy as identified by medical records;

- (2) had complicated assisted delivery such as vacuum or forceps with 4<sup>th</sup> degree tear;
- (3) had delivered a newborn with apparent congenital anomalies or delivered a still-born at birth;
- (4) had a newborn not to be discharged home with the mother; and/or
- (5) were not able to stay in Singapore after hospital discharge in the first 6 weeks post delivery.

Participants with medical and psychiatric history, having complicated assisted delivery and having delivered a baby with congenital anomalies or still born were excluded from the study because all these variables are found to be related to outcome variables significantly (Brown & Lumley, 2000; Mercer, 2004; Ngai & Chan, 2010), which may pose a threat to the internal validity of the study. Also, the intervention programme intended to prevent potential onset of postnatal depression among first-time mothers hence, the mothers with depression were excluded from the study. Only mothers who were discharged home with their babies were included in this study so that they could experience newborn care with their babies in the early postnatal period and were more ready to seek clarifications and learn about newborn care tasks during the educational home visit, a part of PPP. The PPP also included weekly phone call follow-up till approximately six weeks post delivery. Thus, those mothers who were not able to stay during the first six weeks post delivery in Singapore were excluded from the study.

### Sample Size Determination

Power analysis as recommended by Cohen (1992) was used to determine the sample size. The power analysis considers four factors of significant criterion ( $\alpha$ ), sample size (n), effect size (ES) and power (1- $\beta$ ). The sample size is directly related to the power, which means, the greater the sample size, the more the power is and inversely related to the effect size and the significant criterion (Portney & Watkins, 2000). Power is a probability that a test will identify the treatment's effect if it exists and avoid Type II error. According to Polit and Beck (2006), a power of 0.80 is viewed as adequate. The significant



criterion reduces the chance of Type I error, which is the probability of rejecting the null hypothesis when it should be accepted. A significant level of 0.05 is considered acceptable (Polit & Beck, 2006). The effect size is a measure of degree to which null hypothesis is false and is a standardised measure of group differences. Once the effect size, significant criterion and power is specified and identified, the sample size can be calculated (Portney & Watkins, 2000).

The previous research on psychoeducation can provide useful information on effect size and hence sample size can be calculated. Hence, psychoeducation delivered during childbirth educational programmes were considered (Ip et al., 2009; Ngai et al., 2009). The study by Ip et al. (2009) demonstrated medium effect size of 0.6 in fostering childbirth psychoeducation programme to enhance self-efficacy. The other study (Ngai et al., 2009) evaluating the effects of childbirth psychoeducational programme during antenatal period exhibited medium size effect of 0.55. Thus, medium effect size was used to determine sample size in this study.

Based on power analysis calculations, a sample size of 88 pregnant women (44 in each group) were needed to achieve a power of 0.80 at 0.05 level of significance and an effect size of 0.6 for the primary outcome of maternal parental self-efficacy in newborn care (Cohen, 1992). Based on the dropout rate of 30% in previous studies (Ip et al., 2009; Ngai et al., 2009) during the follow-up data collection, an additional 26 first-time mothers would be required. Hence, a minimum of 114 participants (57 in each group) was required for this study.

For the process evaluation interviews, purposive sampling was used to select mothers with different scores in maternal parental self-efficacy at posttest-1 from the intervention group. The authors who developed the PMPS-E instrument (Barnes & Adamson-Macedo, 2007) used median to differentiate the high or low self-efficacy scores. In our study, the median score of maternal parental self-efficacy was 42 [ $17 + (68 - 17) / 2$ ] as the instrument was modified in this study. The mixture of participants with different maternal parental self-

efficacy scores such as above median score of 42 and regarded as having high maternal parental self-efficacy, and those with maternal parental self-efficacy scores below 42 and regarded as having low maternal parental self-efficacy was used to recruit for the interview (Barnes & Adamson-Macedo, 2007; Leahy-Warren & McCarthy, 2010). Purposive sample was used for the interview because deliberately identifying mothers based on specific criteria would allow testing of the effectiveness of PPP (Polit & Beck, 2006). Specifically, participants in the intervention group with different maternal parental self-efficacy scores would be the best experts in providing feedback and sharing their experience about PPP.

The participants with different scores in maternal parental self-efficacy and able to speak and understand the English language were invited to participate in the interviews. Recruiting mothers who have different maternal parental self-efficacy scores would provide a rich description of the impact of PPP on maternal coping in the early postnatal period and understanding variations in their levels of self-efficacy. All the mothers in the intervention group had high self-efficacy scores that were above the medium scores. However, there were variations in their scores from as low as just above the medium score of 42 to the highest possible scores in self-efficacy. Eighteen participants with a wide range of medium scores were recruited based on data saturation, which means no new information emerging from the interview (Holloway, 1997).

### Random Assignment

One hundred and ninety seven postnatal mothers were assessed for eligibility between July 2012 and September 2012. Out of 197 mothers, 140 (71%) were eligible for the study. Most common reasons for ineligibility were multiparity, complicated assisted delivery with fourth degree tear, perinatal psychosis and primiparas delivered baby with low Apgar score and baby admitted to neonatal intensive care unit (NICU). Of those who were eligible, 122 primiparas (87%) gave consent to participate in the study and completed the baseline assessments. Reasons for not giving consent in 18 women (13%) were physical discomfort (n = 3), not interested in the study (n = 3), having

guests at the time of approach (n = 4), and primiparas not able to stay in Singapore (n = 8) in the first six weeks post delivery.

All the primiparas (n = 122) who agreed to participate in the study were given a record number, from 1 to 122. The Research Randomizer (Urbaniak & Plous, 2011) was used to randomly generate a set of 61 unique, non-duplicating numbers from 1 to 122. An opaque envelope containing slips of numbers from 1 to 122 with the randomly generated 61 number slips coded in pink and all other numbers in white was used for data collection. The mothers were asked to pick a slip from the opaque envelope and based on the colour coded slip number that matched with the generated number from randomizer, were allocated into the intervention group; otherwise, in the control group. The consolidated standard of reporting trial (CONSORT) flowchart is presented in Figure 4.

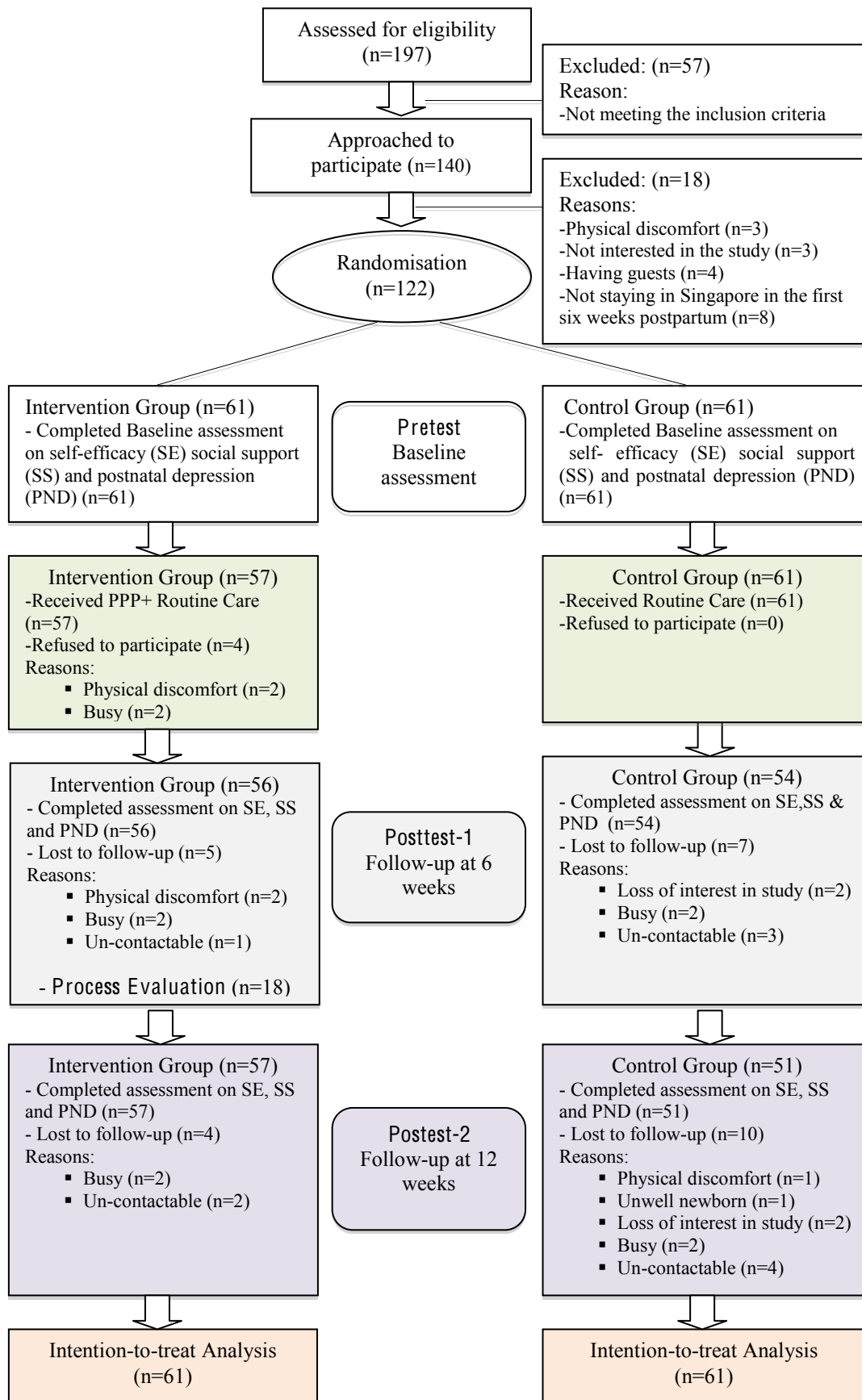


Figure 4. CONSORT Flowchart of the Study

As shown in Figure 4, of the 61 participants in the intervention group who received the routine care in the hospital, 57 of them (93%) received the PPP. The reason for the four mothers' not receiving the PPP was that they refused to participate due to physical discomfort (n = 2) and being busy (n = 2). Among the 57 primiparas who received the PPP, 56 primiparas (92%) completed the posttest-1 data collection at six weeks postpartum and 57 primiparas (93%) completed the posttest-2 survey at 12 weeks postpartum.

In the control group all 61 mothers received the routine care in the hospital. In total 54 of them (89%) completed the posttest-1 at six weeks postpartum and 51 of them (84%) completed the posttest-2 at twelve weeks postpartum. The reasons for not completing the questionnaires at six weeks phone follow-ups were loss of interest in the study (n = 2), being busy (n = 2) and un-contactable mothers (n = 3). The reasons for loss of follow-up at 12 weeks were un-contactable (n = 4), loss of interest in the study (n = 2), physical discomfort (n = 1), unwell baby (1) and being busy (n = 2).

Thus, 57 mothers (93%) in the interventional group and 51 mothers (84%) in the control group completed the follow-up at 12 weeks postpartum making a total of 108 participants (89%) completed the protocol and 14 participants (11%) violated the protocol. The response rate was similar between intervention and control groups at baseline. However both at six weeks and 12 weeks postpartum the control group had a lower response rate. At the end of the intervention programme, 18 mothers (based on data saturation) from the intervention group participated in the process evaluation interviews.

## Interventions

### Routine Care

Both the intervention and control group received the routine care provided by the hospital. The routine care involved postnatal support by nurses and midwives while they stayed in the hospital and follow-up hospital visit with

the doctor after the hospital discharge (Appendix 10). The postnatal support consisted of a one-hour session of parent craft teaching, which mainly focused on baby bathing and breastfeeding support by the lactation consultants during office hours. After office hours, however, ward nurses would then provide this breastfeeding support (anecdotal evidence). The only kind of support available for the mothers after hospital discharge was in the form of follow-up appointments to see the doctor around one to six weeks post delivery. There were no opportunities for mothers to have return demonstrations on baby care tasks such as baby bathing and mingling and learning from other new mothers in the postnatal wards. There are currently no follow-up home visits and education that is provided to the mothers by midwives or community nurses in Singapore.

### Postnatal Psychoeducation Programme

The intervention in this study was a postnatal psychoeducation programme (PPP), which was planned to provide follow-up care to the first-time mothers after the hospital discharge from as early as day five to two weeks post-delivery. The interactive educational programme was based on literature (Fisher et al., 2010; Rowe & Fisher, 2010), Bandura's self-efficacy theory and the Social exchange theory (Blau, 1964; Homans, 1961). The PPP was an additional support, which was provided to the mothers in the intervention group in addition to the routine care. Details of the PPP are outlined in Appendix 11.

PPP involved a postnatal home visit by a midwife (the researcher herself); three follow-up phone calls on a weekly basis and an educational booklet. A single home visit of approximately 90 minutes duration was conducted between days 5 to 14 post-deliveries, as the first two weeks are the most stressful periods for the first-time mothers after childbirth (Kapp, 1998). Many studies (Bennett & Tandy, 1998; Johansson et al., 2010; Kapp, 1998; Lock & Gibb, 2003; Zadoroznyi, 2006) had considered the early home visit support for first-time mothers' postnatally in Western countries but no such support is ever considered in Singapore. Therefore, this study delivered the PPP in the

early postnatal period for the first-time mothers who were allocated in the intervention group. Literature has shown (Bashour et al., 2008; Bennett & Tandy, 1998; Thompson, Roberts, Currie, & Ellwood 2002) that first time mothers had more support needs as compared to the multiparas hence PPP was planned only for the first-time mothers. First-time mothers felt comfortable and secure at their own home environment and welcomed the home visit support by midwives in the previous studies (Bennett & Tandy, 1998; Johansson et al., 2010; Kapp, 1998; Lock & Gibb, 2003; Zadoroznyi, 2006). The home visits support also enabled their transition to motherhood and they felt more satisfied. That was the reason PPP was delivered at the comfortable home environment of the first-time mothers.

According to Christie and Bunting (2010) and Lof et al. (2006), the frequency of home visits did not make any difference in the maternal outcomes. A single home visit and phone follow-up was sufficient to improve maternal confidence with newborn care (Lof et al., 2006). This is essentially why a single home visit was planned and conducted in this study. The first six weeks postpartum are not only crucial for the transition to motherhood but also the chances of having postnatal depression is higher during this period (Chan et al., 2002). Hence, approximately three weekly phone follow-ups in addition to home visits were planned up to approximately six weeks post delivery to provide adequate support to the mothers. The educational session was reinforced with an educational booklet given to the mothers for their reference. The booklet was developed by the researcher based on the literature (e.g. Bashour et al., 2008; Bennett & Tandy, 1998; Fenwick et al., 2010; Kapp, 1998; Nichols et al., 2009) and a preliminary qualitative research exploring first-time mothers' postnatal experiences conducted in Singapore (Ong et al., 2013).

The home visit consisted of a 90 minutes session of face-to-face delivery of PPP focusing on maternal parental self-efficacy, social support and postnatal depression (Appendix 11). Mothers were educated on the importance and factors affecting maternal parental self-efficacy and the ways of enhancing it. The importance of both formal and informal social support was highlighted

and the ways of seeking social support was discussed. As far as possible, the visit was conducted in the presence of a care provider for the mothers such as husbands, maternal mothers and mothers-in law. To promote the emotional well-being of new mothers, the risk and symptoms of postnatal depression were emphasised. It also involved the exploration of major stressors in the early postnatal period so that individualised care could be provided to the mothers according to their problems. The hands-on demonstrations on newborn care tasks such as baby bathing and breastfeeding were delivered according to the specific needs of the mothers.

The contents of the educational booklet were then introduced to the mothers. The topics of various chapters such as maternal self-care and newborn care were presented. How to navigate through the booklet and special features in the booklet (Appendix 12) such as summary statements, list of further readings and important contacts were explained to the mothers. Although the booklet included various information mothers may need till first 12 weeks post delivery, mothers were also advised on further readings via internet. Some of the examples of the further readings included information on newborn vaccination via local Health Promotion Board and breastfeeding.

The mothers were given a homework assignment of keeping a weekly journal (Appendix 11) of the activities, which made them most stressful and how they coped with it. The purpose of having the journal was to discuss mothers' stressors during the weekly phone follow-up so that the researcher could provide them techniques of coping with those stressful situations and to commend those mothers who were handling their stressful situations well.

The same researcher made three phone follow-up calls on a weekly basis and up to six weeks post delivery. The main purpose of the phone follow-up was to explore if there were new stressors and queries after the home visit as per their weekly journals and to answer the mother's queries according to their individual needs. Any doubts from the booklet were addressed and the mothers were reinforced to continue to read the booklet. Each phone session lasted for about 30 minutes so that the mothers were not rushed and all their



queries were answered. An outline on what need to be covered during phone follow-ups was developed to ensure standardisation (Appendix 13).

A detailed intervention protocol was developed for the PPP, which is presented in the Appendix 11. Both the protocol and the contents of the booklet were validated by an expert panel of seven people such as a nursing professor who is experienced in psychoeducation, a Professor in pediatric nursing, a Senior Consultant-Obstetrician, two experienced Midwives in postnatal education and two mothers. They were asked to assess the feasibility and suitability of the programme in the local context. Based on their feedbacks minor amendments were made in the protocol, and a few new topics such as sleeping habits of newborn and coping strategies to combat stress were added to the booklet.

#### Fidelity of the Intervention

In order to maintain the internal validity and to enhance the external validity of the programme, it is important to maintain the fidelity of the intervention (Bellg et al., 2004; Horner, Rew, & Torres, 2006). Fidelity refers to the degree to which the intervention was delivered as intended. Many strategies were used to enhance the fidelity of the intervention such as maintaining the consistency in the delivery of the intervention and monitoring and reinforcing the mother's compliance with the intervention.

To maintain the consistency in the delivery of the intervention, a detailed protocol for the delivery of PPP (Appendix 11) was prepared which experts validated. Also, to maintain standardisation, the same researcher delivered all the sessions of PPP to the mothers in the intervention group. The researcher is a registered midwife who has experience in delivering postnatal education to the mothers.

Mothers were encouraged to comply with the intervention such as home visit and weekly phone follow-up from the day of recruitment. The benefits of participating in the programme such as their queries being answered were

emphasised to the mothers. Messages were sent to the mother as a reminder before the home visit as well as before each phone follow-up. During every phone follow-up the outlined phone call protocol (Appendix 13) was strictly followed and mothers were reinforced to read the booklet.

## Outcome Measures

The main outcomes of the study were maternal parental self-efficacy in newborn care, social support and postnatal depression. The details for the questionnaires and the procedure of data collection are described below.

### Perceived Maternal Parental Self-Efficacy Scale

Perceived Maternal Parental Self-Efficacy (PMP S-E) scale is a domain specific 20-item scale developed by Barnes and Adamson-Macedo (2007) based on the Bandura's self-efficacy theory (1997). As mentioned in Chapter three, a local expert panel validated the instrument and the original 20-item scale was reduced to 17 items because of repetition (Appendix 3). Each item was rated on a four-point Likert scale ranging from 1 (Strongly disagree) to 4 (Strongly agree). The modified PMPS-E scale total score ranged between 17 and 68, where a higher score means higher level of self-efficacy in newborn care. This instrument had Cronbach's alpha of 0.91 as reported by Barnes and Adamson-Macedo, 2007. In the Phase I study conducted in Singapore context, the Cronbach's alpha value was 0.95 and in Phase II study it was 0.89, which indicated a good internal consistency (Nunnally and Berstein, 1994).

### Perinatal Infant Care Social Support Scale

Leahy-Warren (2005) developed the Perinatal Infant Care Social Support Scale (PICSS) based on literature and social exchange theory (Blau, 1964; Homans, 1961). It measures both functional and structural social support. The functional support scale comprised 22 items consisting of four subscales: 7 items for informational support; 7 items for instrumental support; 4 items for

emotional support and 4 items for appraisal support where each item is rated on a four-point Likert scale, with 1 means “totally disagree” and 4 means “totally agree” (Appendix 4a). The total functional social support scores ranged between 22 and 88; a range from 7 to 28 depicted informational and instrumental subscales and 4 to 16 depicted the emotional and appraisal subscales. To make fair comparisons, all the four subscales scores were transformed to a common denominator of 100.

The structural social support identified the individuals who provided support to mothers and comprised nine items. Both formal sources (nurses/midwives, doctors and others such as confinement nannies) and informal sources (husband/partner, maternal parents, parents in-laws, siblings, friends and neighbours) were considered on all four functional subscales. As mentioned in Chapter three, originally there were six items including four items of functional social support, and two items of asking “The length I have got to know this person,” and “ The frequency I contact with this person” were available in the structural social support scale, which were later modified to four items after the validation by the expert panel due to the redundancy of the last two items (Appendix 4b). If participants answered ‘yes’ to any of the four items of functional support from at least one source, they are considered to have received the structural support. The total score ranged from 0 to 36. Cronbach’s alpha of 0.80 was obtained in the previous study (Leahy-Warren 2005). In the present study for Phase I the Cronbach’s alpha was 0.86 and for Phase II was 0.78 for the total PICSS.

#### Edinburgh Postnatal Depression Scale (EPDS)

EPDS is a 10-item instrument, which is widely used to screen postnatal depression in the perinatal period (Cox et al., 1987) (Appendix 14). It has a score range from 0 to 30. Cox and Holden (2003) suggested that using a 9/10 cut off is likely to detect postnatal depression. However, it is recommended (Cox et al., 1987; Elliott et al., 2000) that scores of 13 and above have a 60-100% probability of meeting diagnostic criteria of depression. Hence, in this study, a cutoff point of 13 and above was used to screen for postnatal

depression. Specificity and sensitivity of this instrument have been assessed in many international studies to detect both the minor and the major depression (Cox and Holden 2003). The EPDS sensitivity ranges from 68-80% and specificity is 77%. The Cronbach's alpha coefficient of EPDS in this study (based on the baseline data) was 0.78.

### Demographic and Clinical data

The comprehensive demographic data was collected by a specifically designed questionnaire (Appendix 15). The data were collected to permit examination of potential socio-demographic factors that may influence the outcomes. The data collected included mothers' age, ethnicity, marital status, highest education level, employment status, and monthly household income, antenatal class attendance and the type of delivery.

### Process Evaluation

The semi-structured interview was conducted as a part of the process evaluation that is a complementary approach to outcome oriented evaluation. In process evaluation, various questions such as why and how the intervention worked and how it could be improved further were asked (Breitmayer, Ayres, & Knafl, 1993). In short, the process evaluation explains the process underlying the intervention effects and how the intervention works best. The aim of process evaluation in this study was to explore the mothers' (who were in the intervention group) opinion on the content, activities, delivery methods of the intervention as well as the strengths and weaknesses of the programme thus assessing the quality of the programme. There are two data collection methods in process evaluation such as field observation and semi-structured interview. There is a practical limitation of using a field observation in this study as the intervention was delivered at the mothers' homes. Hence, the semi-structured interview was the method of choice.

Eighteen mothers were interviewed using a semi-structured interview guide (Appendix 16) to assess how satisfied they were with the PPP at six weeks

after childbirth. Semi-structured interviews not only provide a framework on specific and focused agenda but also allow participants to illustrate their ideas and freedom to respond (Morse & Field, 1996; Speziale & Carpenter, 2007). Therefore, a semi-structured guide was developed which included eight open-ended questions on exploring mothers' experience and impact of PPP. This guide enabled the researcher to collect information on how the PPP impacted mothers and enabled them in their transition to early motherhood as well as on suggestions of improving the PPP. The expert panel including two academics expert in psychoeducation and maternal and child health nursing and a clinical obstetrician reviewed the interview guide. They provided comments on clarity and content of the interview guide. The wording and the number of questions were revised after their review.

The interview guide began with open-ended questions such as “How did you feel participating in this programme” and probing questions to how mothers responded in order to get an in-depth idea of mothers' transition to early motherhood with the help of the PPP. Some specific questions such as “which aspect of the PPP such as home visit, follow-up phone calls or educational booklet was beneficial for you” were explored. Nearing the end of the interview, mothers were invited to provide suggestions of how the programme could be further improved.

### Data Collection Procedure

Upon seeking the ethics approval, the permission from the doctor in-charge was taken to explore mothers' case notes to shortlist the mothers who met the inclusion and exclusion criteria. The nurse in-charge of the mothers was also approached to ascertain the physical and psychological well-being of the mothers. The mothers were then approached in the postnatal wards on the day of discharge. This was to ensure that mothers had ample rest and they were not rushed on the day of the delivery. The researcher then introduced herself to the mothers and invited them to take part in the study. The aims of the study, requirements, possible risks and benefits, and the research participant's rights were explained to the mothers based on a participant information sheet. The

mothers were provided sufficient time to make a decision whether to participate in the study or not. One to two hours after the explanation of the study, the mothers were followed-up to obtain their consent in participating in the study. Those mothers who needed more time, a brochure (Appendix 17) with researcher's phone number was left with the mother for her to call the researcher before she left the ward or when she felt she was ready. This is to ensure that mothers were not coerced to participate in the study.

An opaque envelope containing slips of numbers from 1 to 122 with the randomly generated 61 number slips coded in pink and all other numbers in white was used for randomisation. The mothers who agreed to participate in the study were asked to pick a slip from the envelope and based on the colour coded slip number that matched with the generated number from randomiser, were allocated into the psychoeducation intervention group, otherwise, into the control group. As mentioned earlier the envelope was opaque and mothers were unaware of the color codes of the slips until the researcher informed them which group they belonged to. The CONSORT flowchart of the study is shown in Figure 4.

Knowing which group they belonged, mothers' behaviour on responses to questionnaires could be influenced as per the Hawthorne effect (Polit & Beck, 2004). However, it was not possible for mothers not to know which group they belonged, as not all of them would have participated in the home visits. Also, in the subsidised wards where 6-8 mothers shared a cubicle with their beds at arms lengths from each other unlike in private wards where mothers were secluded to their single rooms, it was unavoidable for mothers not to discuss or talk which group they belonged. Due to these practical limitations, it was acceptable to let the mothers know which group they belonged.

The mothers were informed that they had to fill a set of questionnaires three times, on the day of recruitment, 6 weeks post delivery and 12 weeks post delivery. The mothers were aware that this intervention programme was a research study and they were urged to provide objective and honest answers to

the questionnaires so that the postnatal support available to the first-time mothers could be improved.

Participants in the intervention group were also informed of the possibility of being interviewed after the intervention, about 6 weeks post delivery. A Participant Information Sheet (Appendix 18) was provided to them for reference. The explanation took place during the mother's stay in the participating wards on the day of discharge when they were more alert and comfortable.

For those who expressed interest in participating in the study, a written consent (Appendix 19) was taken from them. The participant's demographic data, newborn data as well as baseline information on self-efficacy, social support and depression symptoms were collected via self-administering questionnaires (Appendices 3, 4a, 4b, 14 & 15). The mothers were asked to return the questionnaires to their nurse in-charge before they left for their homes. This is to avoid any coercion to the mothers that influence their response to the questionnaires in the presence of the researcher and thus limiting the bias in data collection (Portney & Watkins, 2008). The researcher collected the returned questionnaires from the nurse in-charge at the end of their shifts on a daily basis. The researcher also obtained the contact details of the participants so that they could be contacted after being discharged from the hospital. A baby bath thermometer costing approximately S\$5.50 was given to each mother at the end of the questionnaire filling in the ward as a token of appreciation for having agreed to participate in the study.

The home visits were arranged at a mutually agreed and convenient time and date, at the mother's home, at approximately 5-14 days post delivery. The participant was contacted a day or two prior to the home visits. Upon the completion of the delivery of PPP at home, the educational booklet was provided to the mothers for reinforcement and the date and time for the weekly follow-up phone call were temporarily fixed. There were a total of three phone calls and each phone call lasted for approximately 30 minutes.

The date and time of the next phone call was fixed after each completed phone call.

At the end of the intervention period, posttest-1 data on maternal parental self-efficacy, social support, postnatal depression (PMPS-E, PICSS, EPDS scores) and mother's satisfaction with the postnatal support (approximately at six weeks post delivery) were collected via phone. Posttest-2 data on maternal parental self-efficacy, social support and postnatal depression (PMPS-E, PICSS, EPDS scores) were collected via phone, at 12 weeks post delivery. Mothers who showed symptoms of postnatal depression as measured by EPDS or any signs of distress during the data collection, were referred back to the obstetrician for follow-up consultations.

To avoid inconvenience, mothers were reminded via text messages for a convenient and preferred time slot before they were called for the follow-up questionnaires. The reasons for collecting data via phone were to minimise the inconvenience of posting questionnaires and hence avoiding the possibility of high attrition rates (Dennis, 2003; Pugh, Milligan, Frick, Spatz & Bronner, 2002). In addition, the same researcher who facilitated the PPP at home also collected the posttest data. This was due to the rapport the researcher had built with the mothers and the trust mothers felt in confiding in the researcher.

In addition, at the end of the intervention programme, that is, 6 weeks post delivery, mothers with different levels of self-efficacy scores were contacted via phone to participate in the face-to-face interview for their feedback on the intervention as well as the strengths and weaknesses of the programme. Mothers were informed on the approximate duration of the interview, which was for a period of 30 minutes to an hour. They were also told that all interviews would be audio recorded using a digital voice recorder and the consent was obtained (Appendix 20). The mothers who declined the interviews to be audio-recorded were not recruited for interview.

The interviews took place at the mothers' home and they were reminded about the interview a day before via text message. The duration of the interviews



ranged from nine minutes to 23 minutes. All the interviews were conducted in English as per the inclusion criteria.

It is understood that to avoid subjective bias, that an independent person would have been ideal to have conducted the interviews with the participants. However, this was not feasible for this study. It should be noted that the majority of the mothers in this study felt comfortable with the researcher who delivered the PPP. The literature highlights that Asian mothers seldom disclose their feelings to the researcher unless they have developed trust with the researcher (Chen & Rankin, 2002; Leung, Arthur, & Martinson, 2004). Hence, in the present study, the researcher who delivered the PPP also collected data for the questionnaires and interview.

The researcher was also aware that her role in data collection and analysis could influence the process and outcome of the study. For example, when planning the intervention, several areas for reflective dialogues were identified including delivery strategies and the researcher's influence on the interventions (Cowling, 1986; Lamb & Huttlinger, 1989; Polit & Beck, 2014) to avoid prejudgments. To avoid personal bias in developing the intervention, the researcher and the panel (senior obstetrician, two academic professors, two midwives and two mothers) were involved. The intervention protocol also ensured standardisation in the delivery of the intervention.

To avoid the potential for bias, the researcher bracketed her experiences and knowledge on the study topic and counteracted this with reflexivity, critical thinking and self-criticism (Holloway, 1997). The researcher paid special attention to her position, perspective, beliefs and values and sought to maintain objectivity during every step of the research process. For example, before data collection, the researcher bracketed her personal views and preconceptions about the phenomenon and kept a personal journal on her reflections on the research process (Finlay, 2002; Knaack, 1984). The researcher brought her beliefs and assumptions to consciousness by asking questions such as, what do I believe and think of maternal parental self-efficacy, social support and postnatal depression symptoms among first-time

mothers in Singapore? What are my feelings when I encounter mothers with issues including depressed mothers? The researcher and her supervisors reviewed these queries and answers. This allowed the researcher and the team to be open to new insights and knowledge about the phenomenon.

In addition, the participants were reminded throughout the course of the study that there was no right or wrong answer and were encouraged to provide honest and objective feedback. Similarly, before and after each interview for the process evaluation, the researcher kept a reflective journal on her personal feelings and interests. The semi-structured interview guide was used to facilitate all interviews and interviews were audio recorded to enhance trustworthiness and to facilitate data analysis and interpretation (Speziale & Carpenter, 2007).

Data analysis was a reflective process and involved a sensitive attunement to opening up to the meaning of experience (Speziale & Carpenter, 2007). The researcher was cautious of the fact that she had had many years of experience in midwifery to bracket her personal preconceptions, values and beliefs and to avoid imposing these during data analysis. The researchers also kept a diary during the data analysis process to record personal feelings and viewpoints to sustain awareness. The researcher also had regular meetings with her supervisors who analysed the data separately. The final themes emerged after several meetings in which consensus was achieved.

### Ethical Considerations

It is important to ensure human rights and dignity of mothers while conducting clinical research on human subjects (Portney & Watkin, 2008). The ethics approval for this study was obtained from the Institutional Review Board of the participating hospital (Appendix 21). The researcher made sure that the ethics standards were maintained at all times and no violations to the ethics board was made during and after the data collection. Belmont's report issued in 1978 and revised in 2001 (Childress, Meslin & Shapiro, 2005) was used to

guide the study. The main ethical principles involved were beneficence, respect for human dignity and justice (Guido, 2009; Hendrik, 2000; Polit & Beck, 2006).

### Beneficence

Beneficence involves minimising harm to the study participants and not subjecting them to unnecessary risks of harm or discomfort (Guido, 2009; Hendrik, 2000; Polit & Beck, 2006). It is the researcher's duty to avoid and prevent possible harm and discomfort and maximises benefits to the participants (Guido, 2006; Portney & Watkins, 2008). In this study, the participating mothers in the intervention group were informed that they might have potential benefit of enhanced self-efficacy in newborn care, social support from a professional midwife and hence smooth transition to motherhood. This might help them to cope better with the stressors of early motherhood and hence enhance their emotional well-being. The mothers in the control group did not receive PPP and hence might suffer potential harm. The intervention in this study was based on theory and previous studies, which was not tested on multi-racial women in Singapore. Hence, the mothers in the control group who received routine care from the hospital might not be disadvantaged.

Mothers were assured that there was no potential risk or harm by participating in this programme. In fact, they would be more aware of their maternal self-efficacy in baby care, help seeking behaviour and the support available to them. The questions that require self-disclosure could cause psychological discomfort (Hendrik, 2000; Polit & Beck, 2006). The mothers who might show symptoms of postnatal depression as measured by EPDS or any signs of distress during the data collection period would be referred back to the obstetrician for follow-up consultation. However, in comparison to the benefits that mothers might receive, these risks seemed to be minimal and not more than ordinarily encountered in daily life.

## Respect for Human Dignity

Respect for human dignity refers to that autonomy of the study where participants should be respected at all times and they should be provided full disclosure of the study so that they could self-determine their participation in the study (Childress et al., 2005; Hendrik, 2000; Polit & Beck, 2006). Full disclosure means that the participants have been explained on the nature of the study, the likely risks and benefits which have been told to them (Portney & Watkins, 2008). Self-determination refers to the participants' right to ask questions and refuse participation in the study if they so deem fit (Guido, 2009).

In this study, full disclosure of the study including the aims, overall procedure, potential benefits and risks was provided to the participating mothers by the researcher so that they had no doubt and wholeheartedly participated in the study. The explanation was provided in English, the language mothers could comprehend with. In addition to the verbal explanation, the written explanation was provided to the mothers in the form of Participant Information Sheet (Appendix 18). It was highlighted to the mothers that participation in this study was voluntary and mothers could withdraw from the study at any point of time. Mothers who were willing to participate in the study was asked to sign on the consent form (Appendix 19). Both verbal and written (see the participant information sheet) assurances was provided to the mothers that their refusal or withdrawal from the study would not affect their treatment and care as well as any of their entitlement.

## Principle of Justice

Principle of justice connotes fairness and equity as well as the right to the participant's privacy (Childress et al., 2005; Guido, 2009; Polit & Beck, 2006). Fairness to treatment was ensured and enhanced by recruiting mothers based on the inclusion and exclusion criteria who were the best representative of the multi-racial population in Singapore and who had benefitted from the intervention. The participating mothers in this study were assured that any

personal details on information shared by them would be kept strictly confidential. They were free to withdraw from the research at any time without any negative consequences. The data collected in this study needed some private information such as name, address and contact details to facilitate the PPP and follow-up phone calls; mothers were advised that only the principal investigator and the co-investigators had an access to the collected data. The researcher took full responsibility to ensure the security of the research data. Complete anonymity of the participants was ensured at all times. All research data was stored in a hard disk, which is kept locked at the main office of the Alice Lee Centre for Nursing Studies, National University of Singapore for 10 years and to be destroyed thereafter. In the process of data collection, if the women's EPDS score were  $\geq 13$ , they were referred to their obstetrician for further follow-up consultation after having obtained prior agreement.

### Data Analysis

The Statistical Package for the Social Sciences (SPSS) for Windows (20.0, SPSS Institute, Chicago, IL) was used to analyse the data. Both descriptive and inferential statistics were used.

### Level of Statistical Significance

Level of significance ( $\alpha$ ) which is the probability that the observed relationship could be attributed to the sampling error, often known as Type I error (Munro, 2005; Portney & Watkins, 2008). The researcher can control the Type I error, which is a rejection of null hypothesis when actually it is true, by specifying the alpha level. The alpha level set for this study was 0.05 which means the risk of rejecting true null hypothesis is only 5%. It is often a convenient value used in Social Science (Portney & Watkins, 2008). Since it is the first study measuring the effect of psychoeducation on maternal self-efficacy, social support and postnatal depression, all the hypothesis was tested using two-tailed tests.

## Normality Test

The baseline scores of the outcome variables, including MPSE as measured by Perceived Maternal Parental Self-Efficacy (PMPS-E) scale, social support as measured by Perinatal Infant Care Social Support (PICSS) scale and postnatal depression as measured by Edinburgh Postnatal Depression Scale (EPDS), were assessed for normality by inspecting the shape of the distribution, as well as the statistical tests of skewness and kurtosis values (Tabachnick & Fidell, 2007). A reasonably straight line was observed in each of the normal quantile-quantile (Q-Q) plots for all the outcome variables indicating they were normally distributed (Appendix 22).

The skewness describes the symmetry of the distribution and kurtosis refers to the ‘peakedness’ or ‘flatness’ of the distribution. Commonly used critical value for skewness and kurtosis is an absolute value of 1.96 corresponding to a 0.05 error level (Hair, Anderson, Tatham & Black, 2006). The skewness and kurtosis values of maternal parental self-efficacy (PMPS-E scale), social support (PICSS scale) and postnatal depression (EPDS) scores at baseline and posttests (6 weeks and 12 weeks) were all within the recommended range of -1.96 and + 1.96, suggesting no violation of the assumption of normality (Table 7).

Table 7. Skewness and Kurtosis values of outcome variables at Baseline and Posttests

Outcome Variables	Baseline		Posttest-1 (at 6 weeks)		Posttest-2 (at 12 weeks)	
	Skewness	Kurtosis	Skewness	Kurtosis	Skewness	Kurtosis
Maternal Parental Self-efficacy (MPSE)	.49	-.21	-.17	-1.22	-1.22	-1.07
Social Support (SS)	.25	-.06	-.11	-1.77	-.11	-1.79
Postnatal depression s (PND)	.50	.19	.08	-.81	.13	-.78

## Level of Measurement

There is an ongoing debate that parametric tests are more robust and can withstand any kind of violations to its assumptions such as data must be on interval or ratio scales ( Knapp, 1990; Hunter & May, 1993) without affecting the validity of statistical outcomes (Zumbo & Zimmerman, 1993). However, some researchers (Howell, 1997; Siegel & Castellan, 1988) were concerned about using parametric test for the ordinal and nominal data. Thus, in this study, the normality of the dependent variables especially the shape of the probability distribution (Zumbo & Zimmerman, 1993), was tested and based on the normality, the parametric tests were used. Whereas, when the data violated the assumption of normality or were measured on nominal or ordinal scale, the non-parametric test was used.

**Chi- square Test.** The Chi-square ( $\chi^2$ ) test or Fisher's exact test was used to examine the baseline differences in the binary demographic data between the intervention group and control group except in the case of age, which was compared using the Independent sample t-test. Chi-square test was also used to examine the differences between the satisfaction level of mothers with the postnatal care mothers received between the intervention and control groups at 6 weeks postpartum. It is usually used for the larger samples however, Fisher's exact test is used when the sample size is small and expected frequency in any of the cells of the table is below 5 (Munro, 2005; Poit & Beck, 2006; Sun & Xu, 2003).

**Independent sample t-test.** The independent sample t-test was used to assess the baseline differences between the interventional and control groups on continuous variables such as maternal parental self-efficacy, social support and postnatal depression. Homogeneity of variance between the groups was assessed using Levene's test for equality. If the assumption of equal variance was violated, the unequal variance of t-test was used (Pallant, 2007; Portney & Watkins, 2000).

**Correlation.** The Product-moment correlation coefficient was used to examine the relationship between outcome variables and the demographic variable that were normally distributed. According to Pallant (2007), the correlation coefficients of 0.10-0.29 0.30-0.49 and 0.50-1.0 are typically interpreted as small, medium and large coefficients respectively.

**Analysis of Variance (ANOVA).** To examine the effects of demographic categorical variable with three or more levels such as highest education level on continuous outcome variables at baseline, ANOVA was used. Levene's test of equal variance was used to assess the equality of variance across different groups of categorical variables.

**Paired t-test.** The paired-t-test is performed to examine the before and after observations' differences in participants from both the intervention and the control groups (Shier, 2004). In other words, the paired t-test was used to examine the difference between the individual scores of maternal parental self-efficacy, social support and postnatal depression from baseline to posttest-1 and from baseline to posttest-2 respectively in both intervention and control groups.

**Multivariate Analysis of Variance (MANOVA).** The repeated measures triply MANOVA was used to determine the effects of PPP on outcome variables including maternal parental self-efficacy, social support and postnatal depression across three time points from baseline, to six weeks and 12 weeks postpartum. The repeated measures triply MANOVA is preferred to a series of separate univariate ANOVA when there is more than one dependent variable and they are interrelated (Munro, 2005; Pallant, 2007; Portney & Watkins 2009). In this study, the three dependent variables of maternal parental self-efficacy, social support and postnatal depression were shown to correlate with each other (Haslam, 2006; Leahy-Warren et al., 2011a). Hence, repeated measures triply MANOVA would be the most appropriate method to examine the overall differences on dependent variables between the intervention and control groups as well as interactions among variables within the groups at different time points. It also provides more



statistical power to detect overall differences among groups and reduces the Type I error (Hair et al., 2006; Portney & Watkins, 2009). The data was also examined by adjusting the outcome variables for various demographic variables (possible confounding factors) using repeated measures triply MANCOVA. To examine the effects of PPP on three outcome variables including maternal parental self-efficacy, social support and postnatal depression at 6 and 12 weeks individually, both MANOVA (unadjusted) and MANCOVA (adjusted for demographic variables) were performed.

The repeated measures triply MANOVA and triply MANCOVA were conducted to determine whether the PPP intervention was effective in improving maternal self-efficacy, social support and reducing postnatal depression over time (Baseline, posttest-1 and posttest-2 time points). That means, the repeated measures triply MANOVA and MANCOVA enabled to depict the main effects of PPP over dependent variables of maternal parental self-efficacy, social support and postnatal depression between the control and intervention group, changes on dependent variables within group over time (interaction effect) as well as comparing differences between groups on the changes of outcome measures over time. Wilk's lambda was chosen to test the level of significance testing, as it is the most widely used statistical criteria in social sciences (Munro, 2005).

To interpret the results of repeated measures triply MANOVA, the interaction effect was studied first. If there is no significant interaction effect, the results are interpreted as such, seeing the significant 'F' value between, and within the groups. However if the interaction effect is significant then, further interpretation is needed based on mean scores and graphical presentation (Leech, Barrett & Morgan, 2009).

#### Management of Missing Data

Missing data can occur at the participant's level where participants lost to follow-up or decided not to participate in the study such as in repeated measures or longitudinal studies (Kneipp & McIntosh, 2001; Polit & Beck, 2006). The missing data can also occur at item level where one or more items

in the survey are not answered by the participants (Kneipp & McIntosh, 2001; Polit & Beck, 2006). Handling missing data is crucial as it can pose serious threat to the validity and generalisability of the research findings (Fogg & Deborah, 2000; Polit & Beck, 2006). However, before handling the missing data, it is important to find the pattern and amount of missing data (Polit & Beck, 2006).

As knowing the pattern of missing data is more important than the amount of missing data (Tabachnick & Fidell, 2007), SPSS missing value analysis and the descriptive statistics were used in this study. Frequencies, measures of central tendency, random sample of cases and plots were used to detect the missing values, errors in the data set, values out of normal limits and outliers in the collected data (Roberts, Anthony, Madigan & Chen, 1997). The questionnaires were rechecked for the accuracy of the data entry before handling the missing data.

Imputation method which is most popular in handling missing data was used in this study. It is the process of estimating the values of missing data based on the available values of variables or cases by using the known relationships between them (Hair et al., 2006). It adopts the principle of intention to treat analysis (ITT) which does not delete any cases and thus retains the statistic power and reduces selection bias in the estimation of treatment effectiveness which was adopted in this study.

Intention to treat analysis (ITT). ITT has been considered as a preferred and robust approach to data analysis for the randomised control trials in literature (Bubbar & Kreder, 2006; Montori & Guyatt, 2001; Newell, 1992; Whittaker, Sutton & Burton, 2006). As ITT is the most clinically informative and most statistically robust method of data analysis (Lewis & Machin, 1993; Little & Lau, 1996; Streiner & Geddes, 2001), it was adopted in addition to per protocol analysis in this study to evaluate the clinical effectiveness of PPP among first-time mothers. There are many studies (Brugha et al., 2000; Elliott et al., 2000) in maternal and child health nursing that have considered ITT in their data analyses and have highlighted that there is no one approach to

perform an ITT analysis. Also, the evidence suggests that if the data is randomly missing and less than 10% of the values are missing, it does not really matter, if single or multiple imputations are chosen (Barzi & Woodward, 2004; Fraser & Yan, 2007 ; Kim, 2006). Hence, the single imputation methods such as imputing unconditional means (Little & Rubin, 1987), that is inserting mean values from the available data to the missing values and the last observation carried forward method where the last value before the missing value was used to replace that value, were used in this study.

Mean replacement involves the calculation of mean values from the available data on a particular variable (observed data) and then using this mean value to replace missing values before analysing the data. This is based on the assumption that the distribution of mean as a whole does not change and it is a conservative procedure of replacing missing data without making any guesses. It is also an easily implemented method of handling missing data which provides complete data to all the cases in the study (Munro, 2005; Polit & Beck, 2006).

Last observation carried forward method involves sorting a dataset according to any of a number of variables, thus creating an ordered dataset. The technique then finds the first missing value and uses the cell value immediately prior to the data that are missing to impute the missing value. The process is repeated for the next cell with a missing value until all missing values have been imputed (Enders, 2006). Like mean replacement it is an easy way of handling missing data to provide complete set of data and thus enhance representativeness of results (Polit & Beck, 2006).

### Thematic Analysis

Thematic analysis was used to analyse the interview data that was collected as a part of process evaluation and was transcribed into verbatim (Graneheim & Lundmn, 2004; Morse & Field, 1996). It is a common approach in qualitative analysis (Morse & Field, 1996) to identify concepts, categories and themes

embedded in the data (Taylor, Kermode, & Roberts, 2006). It involves inductive reasoning process, where themes originate from within the data (Taylor, et al., 2006). The process of thematic analysis involves coding, creating sub-themes and developing themes. Coding encompasses labeling the related words, sentences or paragraphs to reduce and summarise the number of different responses and hence making the comparison easier. Themes include the description and labeling of contents and can have sub-themes. Themes are generally exhaustive and mutually exclusive. Sub-themes are the latent content of the text and it links the underlying meanings of categories together. Sub-themes can fit into more than one theme, thus they are not necessarily mutually exclusive (Graneheim & Lundman, 2004).

The transcription of the data was performed the same day of the interview so that the important non-verbal data could not be missed. This ensures that essential information is retained (Braun & Clarke, 2006). Also, for the thematic analysis, it is important for the researcher to be familiar with the data to analyse it meaningfully (Tayler et al., 2006). For this reason, the same researcher who conducted the interviews did the transcription of audio data. The transcription was re-read and corrected for missing information by the researcher and supervisors independently. It is worth noting that caution was taken against altering the unique characteristics of the participant's language that captured the Singaporean context. Though the interview was conducted in English, some mothers spoke a word or two in dialect (Malay or Chinese) to express their feelings. These words were then translated to the English language in verbatim. A representation of the thematic analysis can be found in Appendix 23.

Lines were numbered from the first to the last line of the text as identifiers for cross-referencing. Pseudonyms based on the participants interview number from 1 to 18, were assigned to each transcript to enable a linkage between the transcripts and audio recording material (McLellan, McQueen & Neidig, 2003). The initial coding was done on the margins of the transcribed text. Codes with similar meaning generated sub-themes, which was transferred to a separate sheet of paper. Themes were then generated from these sub-themes.

Themes from each interview were reviewed so that common themes could be identified from the interviews. Table 8 demonstrates the development of initial codes, sub-themes and themes.

To maintain the trustworthiness of the qualitative data, the four issues that need to be addressed are: credibility, dependability, conformability and transferability (Lincoln & Guba, 1985; Graneheim & Lundman, 2004). Credibility refers to the confidence that the data represents the original data (Lincoln & Guba, 1985). To improve credibility of the data in this study, it was drawn from the mothers with different levels of self-efficacy scores which may exhibit variation in first-time mothers' experiences in transition to early motherhood. Also, the thematic analysis was independently done and then compared between the researcher and the supervisor. Regular communications between the researcher and the supervisor to ensure consensus over the analysis enhanced both the credibility and dependability.

Table 8. The development of initial codes, sub-themes and themes

Transcript Data Extracts	Initial Coding	Sub-themes	Themes
<p>Because I am the first time mummy...ah... at the early stage...I am very very ah.. I am low confident... I do not know how to change the diapers...I even don't know how to hug the baby...(mother and midwife laughed)... I feel the baby is so soft so difficult to hug..and and the most ah... the most worry things..ah.. bothering me is hu..when baby is crying.. I feel so ah... bad... Oh! The baby is crying and I feel very ah.. very sad .. but I don't know how to handle it... and my mood is very low. (8.87-92)</p> <p>Because I am a ah... I am a first-time mom so I don't have any knowledge of taking care of your own baby...I have knowledge those of course school days because I am nurse but of course it is different... if your it is your own baby...so that time I really don't know... I really don't know what to do I really don't know where to start... I really don't know anything...(15.120-124)</p>	<p>Because first-time mummy, do not know how to change diapers, do not know hug the baby, feel bad and sad.</p> <p>First-time mom, don't have knowledge in taking care the baby</p>	Newborn care issues	Challenges of postnatal period
<p>After you have visited me ...after you have seen me doing ah...like breastfeeding...hmm...burping my son... and and you say this is the correct way so I feel that's that's the way... and I am doing good.. I am doing fine...ok...that's that's makes me more confidence that I am doing it right... (7.49-52)</p> <p>It really very ha...makes me more confident because people ah... some professional come to my house and then like oh... I am doing good other than that you think... tell yourself correct ah.. like this can or not...(mother laughed)... so it's like when you (midwife) came and I tell you about milk... and you said oh ya its ok to combine all... so I don't feel I am a failure you know...ya...(9.209-213)</p>	<p>I am doing good, I am doing correct way, makes me more confidence</p> <p>Makes me more confident, I am doing good. I don't feel I am a failure</p>	Enhanced confidence level	Benefits of participating in postnatal psychoeducation programme (PPP)

Dependability refers to the stability of collected data over time, which is similar to reliability in quantitative research (Polit & Beck, 2006). To ensure dependability of the data, it was collected and transcribed by the same researcher. A semi-structured interview guide was used to ensure consistency and further enhance the dependability. Field notes were taken and the interviews were audio-recorded to have more comprehensive interpretation of the data.

Conformability refers to how well the findings are supported by the data collected and how objective is the data (Lincoln & Guba, 1985). To increase conformability and external validity, two experts in mental health nursing and qualitative research reviewed the process of data collection and analysis. Also, the researcher critically examined her pre-conceived thoughts on postnatal support and motherhood by bracketing to minimise subjective bias to the data.

To enhance transferability of the data, which simply means generalisability of the data beyond the bounds of the project (Lincoln & Guba, 1985), the detailed description of the context of the study, characteristics of participants, data collection and data analysis were provided. This would enable other researchers to transfer the conclusion of enquiry to other cases or to repeat the procedures as closely to this study where possible.

### Summary

This chapter discussed the methodology of the study, which aimed to test the effectiveness of postnatal psychoeducation programme (PPP) on outcomes of first-time mothers in Singapore. The randomised controlled pre-test and posttests research design, which is the most powerful research method available for testing the hypothesis of causal relationship, was adopted in the study.

The study was conducted in a public hospital in Singapore and the data was collected from both the private and subsidised groups of mothers. The intervention was a PPP, which included a home visit, followed by three phone calls and an educational booklet for the purpose of reinforcement. The outcome measures involved maternal parental self-efficacy in newborn care, social support and postnatal depression. A variety of instruments including Perceived Maternal Parental Self-Efficacy (PMPS-E), Perinatal Infant Care Social Support (PICSS) scales and the Edinburgh Postnatal Depression Scale (EPDS) were used to collect data. The data was collected at baseline, 6 weeks (immediately after the intervention) and 12 weeks postpartum. The variety of data analyses methods such as Independent sample t-test, ANOVA and

repeated measures triply MANOVA was used to analyse the data. Data was managed by intention to treat analysis.

A semi-structured interview was conducted from the participants in the intervention group after the intervention as a form of process evaluation to assess the maternal satisfaction with PPP. A purposive sample of mothers with different self-efficacy scores after the intervention was selected and recruited till data saturation from the intervention group. Thematic analysis was used to analyse the data. Every effort was put to enhance the trustworthiness of the qualitative data. The next Chapter will address the detailed results of the data analyses, which would enable the testing of the hypotheses of the study.



## CHAPTER 5 PHASE II RESULTS

### Introduction

This chapter presents the results of the Phase II study, which is divided into six sections. The first section presents the results of the comparison of participants' demographic and clinical variables, as well as outcome variables that completed and violated the protocol.

The second section reports the results of baseline data, including the comparison of baseline characteristics of participants between two groups and the levels of maternal parental self-efficacy, social support and postnatal depression between groups to determine the homogeneity between the groups.

The third section reports the relationships among the baseline dependent variables. The descriptive statistics of the outcome variables are also presented. The results of repeated measures triply MANOVA and repeated measures triply MANCOVA which are used to determine the differences between the intervention and control groups on the outcome variables of maternal parental self-efficacy, social support and postnatal depression across three time period (baseline, immediately post intervention around six weeks and 12 weeks postpartum) is presented in section three. The results of both per protocol analysis and intention to treat analysis are presented.

The fourth section presents the results of MANOVA and MANCOVA used to determine the differences between the intervention and control groups on maternal parental self-efficacy, social support and postnatal depression at six weeks and twelve weeks postpartum. The fifth section presents the participants' satisfaction level with the postpartum psychoeducation programme (PPP) and the overall postnatal support received. The final section presents the qualitative data concerning the participants' perceptions on the impact of the PPP.

## Results of the Missing Values

Total data points for the intervention group (n = 61) and comparison group (n = 61) at three points of data collection (baseline, posttest-1 at six weeks postpartum and posttest-2 at twelve weeks postpartum) was 366 (61 participants x 2 groups x 3 measurement points). Of the possible 366 data points, a total of 26 data points (7%) was deemed missing during the three measurement points among the interventional and control groups (Table 9). This percentage of missing data was under 10%, which is considered low, and is acceptable for data imputation to produce approximately unbiased results if the missing data mechanism is random (Barzi & Woodward, 2004; Fairclough, Thijs, Huang, Finnern, & Wu, 2008; Fraser & Yan, 2007; Kim, 2006). A comparison of the baseline characteristics (both demographics and outcome variables) for participants who completed the protocol and those who violated the protocol showed no significant differences (Tables 10 & 11). This ensured the randomness of the missing data hence imputation with carried forward last value and replacing with the mean was used for intention-to-treat analysis.

Table 9. Missing data in both groups over three time points

Data Collection	Total Data Points		Missing Data Points	
	Intervention	Control	Intervention	Control
Baseline	61	61	0	0
Posttest-1 at 6 weeks postpartum	61	61	5	7
Posttest-2 at 12 weeks postpartum	61	61	4	10
Subtotal	183	183	9	17
Total	366		26	
Missing Data (%)	26 / 366 = 7			

Table 10. Comparison of demographic and clinical characteristics between the participants completed and violated the protocol (n=122)

Characteristics	Completed Protocol (n=108)	Violated protocol (n=14)	$\chi^2$	<i>p</i>
	n (%)	n (%)		
Age: mean (SD)	28.7(4.3)	27.3 (4.8)	1.15 <sup>#</sup>	.25
Ethnicity			2.39	.50
Chinese	32 (30)	7 (50)		
Malay	23 (21.3)	2 (14.3)		
Indian	30 (27.8)	3 (21.4)		
Others	23 (21.3)	2 (14.3)		
Marital Status			.96 <sup>F</sup>	1
Married	101 (93.5)	14 (100)		
Single/Others	7 (6.5)	0		
Educational Level			2.47	.29
Primary/Secondary School	17 (15.7)	4 (28.6)		
ITE/Polytechnic/Junior College	34 (31.5)	2 (14.3)		
University Degree/ Higher Degree	57 (52.8)	8 (57.1)		
Employment Status			.59 <sup>F</sup>	.55
Working	74 (68.5)	11 (78.6)		
Not-Working	34 (31.5)	3 (21.4)		
Monthly Household Income			.70 <sup>F</sup>	.55
<\$3000	35 (32.4)	3 (21.4)		
\$3000 & Above	73 (67.6)	11 (78.6)		
Antenatal Class Attendance			2.06 <sup>F</sup>	.19
Yes	26 (24.1)	1 (7.1)		
No	82 (75.9)	13 (93)		
Type of Birth				
Normal Vaginal Delivery/Assisted Delivery	58 (54)	9 (64)		
Caesarean Section	50 (46.3)	5 (35.7)	.56 <sup>F</sup>	.57

Note: <sup>#</sup>Independent sample t-test, <sup>F</sup>=Fisher's Exact test

Table 11. Comparison of baseline levels of outcome variables between mothers completed and violated the protocol (n = 122)

Variables	Participants Completed Protocol (n=108)	Participants Violated Protocol (n=14)	t	p
	Mean (SD)	Mean (SD)		
Maternal Parental Self-efficacy <sup>1</sup>	31.4 (7.0)	33.6 (7.1)	-1.15	.25
Social Support <sup>2</sup>	56.6 (6.8)	58.9 (5.8)	-1.20	.23
Postnatal depression <sup>3</sup>	8.2 (4.2)	8.1 (3.6)	.07	.95

Note: <sup>1</sup>=Perceived Maternal Parental Self-efficacy (PMPS-E) scale scores; <sup>2</sup>= Perinatal Infant Care Social Support (PICSS) scale scores; <sup>3</sup>= Edinburgh Postnatal Depression Scale (EPDS) scores

### Comparison of Demographic and Clinical Characteristics between Groups

As shown in Table 12, the sample consisted of 122 participants who had the mean age of 28.6 years (SD = 4.4, range = 19-39). The percentages of mothers with various ethnicities were similar between the two groups. Most of the participants were married (n =115, 94.3%), working (n = 85, 69.7%) with a monthly household income of S\$ 3000 (US\$2500) and above (n = 84, 68.9%). More than half of the mothers had a university degree and above (n = 65, 53.3%). Majority of the participants (n = 95, 77.9%) did not attend antenatal education and almost half of them (n = 67, 54.9%) had normal vaginal delivery or assisted delivery.

Table 12. Comparison of mothers' demographic and clinical characteristics between groups (n = 122)

Characteristics	Total (n=122)	Intervention Group (n=61)	Control Group (n=61)	$\chi^2$	<i>p</i>
	n (%)	n (%)	n (%)		
Age: mean (SD)	28.6 (4.4)	28.6 (4.2)	28.5 (4.6)	.06 <sup>#</sup>	.95
Range	19-39	19-39	19-38		
Ethnicity				4.42	.22
Chinese	39 (32)	21 (34.4)	18 (29.5)		
Malay	25 (20.5)	16 (26.2)	9 (14.8)		
Indian	33 (27)	15 (24.6)	18 (29.5)		
Others	25 (20.5)	9 (14.8)	16(26.2)		
Marital Status				.15 <sup>F</sup>	1
Married	115 (94.3)	58 (95.1)	57 (94.3)		
Single/Others	7 (5.7)	3 (4.9)	4 (5.7)		
Educational Level				.06	.97
Primary/Secondary School	21 (17.2)	11 (18.0)	10 (16.4)		
ITE/Polytechnic/Junior College	36 (29.5)	18 (29.5)	18 (29.5)		
University Degree/ Higher Degree	65 (53.3)	32 (52.5)	33 (54.1)		
Employment Status				.97	.33
Working	85 (69.7)	45 (73.8)	40 (65.6)		
Not-Working	37 (30.3)	16 (26.2)	21 (34.4)		
Monthly Household Income				.00	1
<\$3000	38 (31.1)	19 (31.1)	19 (31.1)		
\$3000 & Above	84 (68.9)	42 (68.9)	42 (68.9)		
Antenatal Class Attendance				1.19	.28
Yes	27 (22.1)	11 (26.2)	16 (18)		
No	95 (77.9)	50 (73.8)	45 (82)		
Type of Birth				5.59	.018 <sup>*</sup>
Normal Vaginal Delivery/Assisted Delivery	67 (54.9)	27 (44.3)	40 (65.6)		
Caesarean Section	55 (45.1)	34 (55.7)	21 (34.4)		

Note: <sup>#</sup>Independent t-test. <sup>F</sup>=Fisher's Exact test. <sup>\*</sup><0.05

Table 12 also shows that significant difference was found on type of birth ( $\chi^2 = 5.59$ , *df* = 1, *p* = .018) between the two groups; more mothers in the control group had vaginal deliveries (65.6%) as compared to those in the intervention group (44.3%). No significant differences were found on other demographic characteristics between groups.

## Comparison of Baseline Perceived Maternal Parental Self-efficacy, Social Support and Postnatal Depression between Groups

Table 13 shows that at baseline, participants had a low level of maternal parental self-efficacy on perceived maternal parental self-efficacy (PMPS-E) scale with a mean score of 31.6 (SD = 7.0), which is below the median score of 42. Participants had a mean score of 56.8 (6.7) on Perinatal Infant Care Social Support (PICSS) scale. The mean score of postnatal depression on EPDS was 8.2 (SD = 4.1) with 17 women (13.9%) scored 13.0 or which was used as a cutoff score for screening postnatal depression (Murray & Cox, 1990).

Table 13. Comparison of Baseline Perceived Maternal Parental Self-efficacy, Social Support and Postnatal Depression between Groups (n=122)

Variables	Total (n=122)	Intervention Group (n=61)	Control Group (n=61)	t	p
	Mean (SD)	Mean (SD)	Mean (SD)		
Maternal Parental Self-efficacy <sup>1</sup>	31.6 (7.0)	30.1(7.2)	33.2 (6.6)	-2.46	.015*
Social Support <sup>2</sup>	56.8 (6.7)	56.2 (6.3)	57.5 (7.1)	-1.11	.27
Postnatal depression <sup>3</sup>	8.2 (4.1)	8.7 (4.4)	7.7 (3.8)	1.41	.16

Note: <sup>1</sup>=Perceived Maternal Parental Self-efficacy (PMPS-E) scale scores; <sup>2</sup>= Perinatal Infant Care Social Support (PICSS) scale scores; <sup>3</sup>= Edinburgh Postnatal Depression Scale (EPDS) scores \*  $p < 0.05$

Table 13 also shows that significant difference was found between the two groups on the maternal parental self-efficacy scores ( $t = -.246$ ,  $df = 120$ ,  $p = .015$ ), with mothers in the control group reported higher level of maternal parental self-efficacy. No significant differences were found on social support ( $t = -1.11$ ,  $df = 120$ ,  $p = .27$ ) and postnatal depression scores ( $t = 1.41$ ,  $df = 120$ ,  $p = .16$ ) between the two groups.

### Baseline Maternal Parental Self-Efficacy (PMPS-E)

Table 13 shows that mothers in the control group had higher levels of maternal parental self-efficacy with statistical significant difference. In detail, as shown in Table 14, the mean scores on individual items of PMPS-E scale at baseline showed that the participants had low maternal parental self-efficacy on several newborn care tasks such as bathing the baby [ $M = 1.2 (0.5)$ ] and awareness of activities baby do not enjoy [ $M = 1.3 (0.6)$ ]. The statistically significant differences were found on individual items of PMPS-E scores between the intervention and control groups on the following newborn care tasks: changing the baby ( $t = -2.21, df = 120, p = .029$ ), telling when the baby was tired and needed sleep ( $t = -2.11, df = 120, p = .037$ ), reading the baby's cues ( $t = -2.07, df = 120, p = .04$ ) and believing to have a good interaction with the baby ( $t = -2.03, df = 120, p = .046$ ). For all these items, mothers in the control group had comparatively higher self-efficacy level.

Table 14. Baseline maternal parental self-efficacy (MPSE) (n=122)

Items no.	Maternal parental self-efficacy in newborn care	Total	Intervention Group	Control Group	t	p
		(n=122)	(n=61)	(n=61)		
		Mean(SD)	Mean (SD)	Mean (SD)		
1	I am good at feeding my baby	1.7 (.7)	1.7 (.6)	1.7 (.7)	-.68	.49
2	I am good at changing my baby	1.6 (.9)	1.5 (.7)	1.8 (.9)	-2.21	.029*
3	I am good at bathing my baby	1.2 (.5)	1.2 (.4)	1.3 (.6)	-1.2	.23
4	I can make my baby happy	2.1 (.9)	2.1 (.9)	2.2 (.9)	-.92	.34
5	I can make my baby calm when he/she cries	2.1 (.8)	2.0 (.8)	2.3 (.8)	-1.92	.057
6	I am good at soothing my baby when he/she becomes more restless	1.5 (.6)	1.4 (.6)	1.5 (.6)	-1.03	.31
7	I am good at getting my baby's attention	1.9 (.8)	1.8 (.8)	2.0 (.8)	-1.47	.15
8	I believe I can tell when my baby is tired and needs to sleep	1.8 (.8)	1.6 (.7)	1.9 (.8)	-2.11	.037*
9	I believe I have control over my baby	1.6 (.7)	1.5 (.6)	1.7 (.8)	-1.61	.11
10	I can tell when my baby is sick	1.5 (.7)	1.4 (.7)	1.6 (.7)	-1.17	.24
11	I can read my baby's cues	1.6 (.7)	1.5 (.6)	1.7 (.7)	-2.07	.04*
12	I am good at understanding what my baby wants	1.5 (.6)	1.4 (.6)	1.5 (.6)	-1.23	.22
13	I am good at keeping my baby occupied	1.4 (.6)	1.3 (.5)	1.5 (.6)	-1.40	.16
14	I am good at knowing what activities my baby does not enjoy	1.3 (.6)	1.3 (.5)	1.4 (.6)	-.96	.34
15	I believe my baby responds well to me	2.4 (.7)	2.3 (.8)	2.5 (.6)	-1.62	.11
16	I believe that my baby and I have a good interaction with each other	2.8 (.6)	2.7 (.7)	2.9 (.4)	-2.03	.046*
17	I can show affection to my baby	3.7 (.5)	3.6 (.5)	3.7 (.5)	-.73	.47
Total PMPSE Scores		31.6(7.0)	30.1 (7.2)	33.2 (6.6)	-2.46	.015*
Range <sup>#</sup>		20-50	20-48	22-50		

Note: \*<0.05; <sup>#</sup>Normal range=17-68



## Baseline Social Support

Table 13 showed no statistically significant differences in mean scores of baseline social support between the intervention and control groups. Table 15 shows the sub-scales of functional social support which showed that mothers in the intervention group received lower informational [M = 45.7 (10.4)] and instrumental [M = 53.9 (6.1)] support as compared to the emotional [M = 72.5 (13.1)] and appraisal [M = 61.9 (10.6)] support. For the mothers in the control group, the situation was the same, that is, mothers received lower scores in the informational [M = 47.1 (9.6)] and instrumental [M = 55.4 (8.2)] support as compared to the emotional [M = 76.2 (10.6)] and appraisal [M = 64.3 (11.3)] support. However, these differences in functional social support were not statistically significant (Table 15).

For the structural social support sub-scales, the informal support from significant others received by mothers in both the intervention [M = 25.4 (7.9)] and control [M = 24.5 (7.5)] groups were higher as compared to the formal support from health professionals and others in both the intervention [M = 5 (7.5)] and control [M = 4.2 (5.8)] groups. The differences in structural social support however, were not statistically significant (Table 15).

As shown in Table 16, the main sources of structural support for mothers in both groups were from husbands and parents. The main types of support provided by the husbands were emotional and appraisal in both groups. The main type of support provided by parents for both groups was appraisal support. Neighbors, siblings and doctors provided least support to mothers in both the groups. Nurses/midwives were the main sources of informational support to mothers in both groups.

Table 15: Comparison of baseline total social support, functional and structural support between groups

Variables	Total (n=122)	Intervention group (n=61)	Control group (n=61)	t	p
	Mean (SD) /Actual range	Mean (SD) /Actual range	Mean (SD) /Actual range		
Total Social Support Score Normal Range =22-124	56.8 (6.7) 39-74	56.2 (6.3) 39-70	57.5 (7.1) 48-74	-1.11	.27
(1) Functional Social Support Score Normal Range = 22-88	50.3 (6.2) 33-66	49.4 (5.9) 33-66	51.1 (6.4) 42-66	-1.49	.14
– Informational Support Normal Range = 7-28	12.9 (2.8) 8-22 #46.1 (10)	12.8 (2.9) 9-22 #45.7 (10.4)	13.2 (2.7) 8-19 #47.1 (9.6)	-.74	.46
– Instrumental Support Normal Range= 7-28	15.3 (2.0)/9-21 # 54.6 (7.1)	15.1 (1.7) 9-18 #53.9 (6.1)	15.5 (2.3) 11-21 #55.4 (8.2)	-1.16	.25
– Emotional Support Normal Range = 4-16	11.9 (1.9) 4-16 #74.4 (11.9)	11.6 (2.1) 4-16 #72.5 (13.1)	12.2 (1.7) 8-16 #76.2 (10.6)	-1.59	.12
– Appraisal Support Normal Range = 4-16	10.1 (1.7) 4-14 #63.1 (10.6)	9.9 (1.7) 4-14 #61.9 (10.6)	10.3 (1.8) 7-14 #64.3 (11.3)	-.95	.34
(2) Structural Social Support Score Normal Range = 0-36	6.6 (2.2)/4-13	6.7 (2.1)/4-11	6.4 (2.2)/4-13	.79	.43
– Informal Support Normal range = 0-24	6.0 (1.9)/3-11 #25 (7.9)	6.1 (1.9)/3-11 #25.4 (7.9)	5.9 (1.8)/4-11 #24.5 (7.5)	.62	.54
– Formal Support Normal Range = 0-12	.56 (.8)/0-3 #4.6 (6.7)	.6 (.9)/0-3 #5 (7.5)	.5 (.7)/0-2 #4.2 (5.8)	.70	.48

# Transformed data to the common denominator of 100

Table 16. Baseline structural social support (n=122)

Type of Structural Support for Intervention Group						
Source of Support	No Support	Informational Support	Instrumental Support	Emotional Support	Appraisal Support	Total Structural Support
	n (%)	n (%)	n (%)	n (%)	n (%)	Mean (SD)
Husband/Partner	5 (8.2)	2(3.3)	7 (11.5)	23 (37.7)	24 (39.3)	3.0 (1.2)
Parents	13 (21.3)	7 (11.5)	6 (9.8)	8 (13.1)	27 (44.3)	2.5 (1.6)
Parents-in law	48 (78.7)	10 (16.4)	1 (1.6)	1 (1.6)	1 (1.6)	0.3 (.7)
Siblings	55 (90.2)	5 (8.2)	1 (1.6)	---	---	0.1 (0.4)
Friends	54 (88.5)	7 (11.5)	---	---	---	0.1 (0.3)
Neighbor	60 (98.4)	1 (1.6)	---	---	---	0.02 (0.1)
Nurse/Midwife	36 (59)	20 (32.8)	5 (8.2)	---	---	0.5 (0.6)
Doctor	54 (88.5)	7(11.5)	---	---	---	0.1 (0.3)
Others	54 (88.5)	7(11.5)	---	---	---	0.1 (0.3)
Type of Structural Support for Control Group						
Source of Support	No Support	Informational Support	Instrumental Support	Emotional Support	Appraisal Support	Total Structural Support
	n (%)	n (%)	n (%)	n (%)	n (%)	M (SD)
Husband/Partner	5(8.2)	2 (3.3)	4 (6.6)	21 (34.4)	29 (47.5)	3.1 (1.2)
Parents	18 (29.5)	9 (14.8)	9 (14.8)	4 (6.6)	21 (34.4)	2.0 (1.7)
Parents-in law	51 (83.6)	9 (14.8)	1 (1.6)	---	---	0.2 (0.4)
Siblings	54 (88.5)	7 (11.5)	---	---	---	0.1 (0.3)
Friends	48 (78.7)	12 (19.7)	---	---	1 (1.6)	0.3 (0.6)
Neighbor	58 (95.1)	3 (4.9)	---	---	---	0.05 (0.2)
Nurse/Midwife	37 (60.7)	23 (37.7)	1 (1.6)	---	---	0.4 (0.5)
Doctor	55 (90.2)	6 (9.8)	---	---	---	0.1 (0.3)
Others	53 (86.9)	6 (9.8)	2 (3.3)	---	---	0.2 (0.5)

## Differences of Baseline Maternal Parental Self-Efficacy, Social Support and Postnatal Depression among Demographic and Clinical subgroups

The differences of the baseline levels of three outcomes among/between the demographic and clinical subgroups are summarized in Table 17. Age was found to have significant but weak correlation with maternal parental self-efficacy ( $r = -.21$ ,  $p < 0.05$ ) but not with social support and postnatal depression. Older mothers tend to have lower maternal parental self-efficacy as compared to the younger mothers.

Independent sample t-test and analysis of variance (ANOVA) were used to examine the differences of outcome variables between/among the demographic and clinical subgroups such as ethnicity, marital status and type of birth. Table 17 also shows that significant differences were found on baseline maternal parental self-efficacy level ( $F = 3.90$ ,  $p = .011$ ) among mothers with different ethnicities, as well as social support level ( $t = 2.0$ ,  $p = .049$ ) between mothers with different marital status.

Hence age, ethnicity and marital status were considered as possible covariates for the outcome variables.

Table 17. Differences of levels of baseline outcome variables between/among demographic and clinical subgroups (n=122)

Demographic Variables	Baseline MPSE			Baseline SS			Baseline PND		
	df	t/F	<i>p</i>	df	t/F	<i>p</i>	df	t/F	<i>p</i>
Age <sup>#</sup>			<i>r</i> = -.21*			<i>r</i> = -.12			<i>r</i> = -.12
Ethnicity	3	3.90 <sup>F</sup>	.01*	3	F=1.32	.27	3	F=.77	.51
Marital Status	120	.02 <sup>t</sup>	.99	120	t=2.0	.049*	120	t=.02	.74
Educational Level	2	.03 <sup>F</sup>	.97	2	F=1.31	.27	2	F=.41	.67
Employment Status	95.6	.86 <sup>t</sup>	.39	120	t=.23	.82	120	t=-.44	.66
Monthly Household Income	120	-1.15 <sup>t</sup>	.25	120	t=-1.07	.29	120	t=.95	.35
Antenatal Class Attendance	120	-1.20 <sup>t</sup>	.23	120	t=1.16	.25	120	t=-.30	.76
Type of birth	120	1.22 <sup>t</sup>	.23	120	t=.43	.67	120	t=-1.16	.25

Note: MPSE=Maternal Parental Self-efficacy; SS= Social Support; PND = Postnatal depression

<sup>#</sup>Pearson's Product-Moment Correlation Coefficient. \* <0.05.

<sup>t</sup>= Independent sample t-test. <sup>F</sup>= Analysis of Variance (ANOVA)

## Relationships among Maternal Parental Self-Efficacy, Social Support and Postnatal Depression

Inter-relationships among outcome variables including maternal parental self-efficacy (PMPSE scores), social support (PICSS scores) and postnatal depression (EPDS scores) across three measurement points are presented in Table 18. There were significant correlations among all outcome variables across all measurement points (baseline, posttest-1 and posttest-2). At baseline, there was significant positive correlation between maternal parental self-efficacy and social support ( $r = .30, p < 0.01$ ) and significant negative correlation between maternal parental self-efficacy and postnatal depression ( $r = -.24, p < 0.05$ ). Likewise at posttest-1 (6 weeks) and posttest-2 (12 weeks), maternal parental self-efficacy was significantly positively correlated with social support ( $r^{6 \text{ weeks}} = .86, p < .01$ ;  $r^{12 \text{ weeks}} = .85, p < .01$ ) and significantly negatively correlated with postnatal depression ( $r^{6 \text{ weeks}} = -.61, p < .01$ ;  $r^{12 \text{ weeks}} = -.74, p < .01$ ). Moreover, significant negative correlations were also found between social support and postnatal depression at baseline ( $r = -.25, p < 0.05$ ), posttest-1 ( $r^{6 \text{ weeks}} = -.59, p < .01$ ) and posttest-2 ( $r^{12 \text{ weeks}} = -.73, p < .01$ ).

All baseline outcome variables were not significantly correlated with their respective posttest assessments. Maternal parental self-efficacy at posttest-1 was strongly positively correlated to the maternal parental self-efficacy at posttest-2 ( $r^{12 \text{ weeks}} = .87, p < 0.01$ ), social support at posttest-2 ( $r^{12 \text{ weeks}} = .88, p < 0.01$ ) and strongly negatively correlated to postnatal depression at posttest-2 ( $r^{12 \text{ weeks}} = -.70, p < 0.01$ ). Likewise social support at posttest-1 was strongly correlated with the social support ( $r^{12 \text{ weeks}} = .94, p < 0.01$ ) and postnatal depression ( $r^{12 \text{ weeks}} = -.70, p < 0.01$ ) at posttest-2. In addition, postnatal depression in posttest-1 was positively correlated with posttest-2 ( $r^{12 \text{ weeks}} = .50, p < 0.01$ ). All the correlations were strong.

Table 18. Relationships among outcome variables measured at three time points (n = 122)

	SE1	SS1	PND1	SE2	SS2	PND2	SE3	SS3	PND3
SE1	---								
SS1	.30**	---							
PND1	-.24*	-.25*	---						
SE2	-.05	-.09	.11	---					
SS2	-.18	-.01	.18	.86**	---				
PND2	.21	-.07	.05	-.61**	-.59**	---			
SE3	-.01	-.09	.05	.87**	.82**	-.49**	---		
SS3	-.12	-.05	.09	.88**	.94**	-.59**	.85**	---	
PND3	.14	.17	-.06	-.70**	-.70**	.50**	-.74**	-.73**	---

Note. SE1=Self -efficacy at Baseline; SS1= Social Support at Baseline, PND1 =Postnatal depression at baseline

SE2 = Self -efficacy at 6 weeks; SS2= Social Support at 6 weeks, PND2 =Postnatal depression at 6 weeks

SE3 = Self -efficacy at 12 weeks; SS3= Social Support at 12 weeks, PND3 =Postnatal depression at 12 weeks

\* $p < 0.05$ . \*\* $p < 0.01$ .

### Mean Differences of Maternal Parental Self-Efficacy, Social Support and Postnatal Depression at Posttest-1 and 2 from Baseline

The means, standard deviations and changes of outcome variables including maternal parental self-efficacy, social support and postnatal depression across three measurements in the intervention and control groups are presented in Table 19. The results of paired t-tests, which examined the differences of the mean scores of the outcome variables at posttest-1 and posttest-2 from baseline, are also presented. Bonferroni correction was used adjusting the alpha value to 0.025 to control overall Type 1 error rate considering two comparisons across the three measurement points (Portney & Watkins, 2008).



Table 19. Means, standard deviations and mean score changes in outcome variables at baseline and posttests

Measures	Baseline	Posttest-1	Change between posttest-1 and baseline scores			Posttest-2	Change between posttest-2 and baseline scores		
	Mean (SD)	Mean (SD)	Change of mean score	t <sup>#</sup>	p	Mean (SD)	Change of mean score	t <sup>#</sup>	p
	Intervention Group (n=61)		Intervention Group (n= 56)			Intervention Group (n=57)			
MPSE	30.21 (7.41)	59.75 (4.16)	29.54 (97.8)	-28.57	<0.001*	63.49 (8.26)	33.28 (110.2)	-23.88	<0.001*
SS	56.20 (6.53)	90.73 (5.42)	34.53 (61.4)	-34.30	<0.001*	89.70 (4.75)	33.5 (59.6)	-33.82	<0.001*
PND	8.93 (4.39)	6.64 (2.77)	-2.29 (-25.6)	3.70	<0.001*	3.53 (2.68)	-5.4 (-60.5)	8.72	<0.001*
	Control Group (n=61)		Control Group (n=54)			Control Group (n=51)			
MPSE	32.74 (6.28)	41.81 (5.43)	9.07 (27.7)	-9.64	<0.001*	49.65 (5.83)	16.91 (51.6)	-17.75	<0.001*
SS	56.98 (7.07)	53.33 (7.47)	-3.65 (-6.4)	2.72	0.009*	57.08 (6.60)	0.1 (0.17)	-.014	.989
PND	7.26 (3.60)	10.80 (2.95)	3.54 (48.7)	-6.21	<0.001*	9.35 (2.99)	2.06 (28.3)	-2.54	.014*

Note: MPSE= Maternal Parental Self-efficacy; SS= Social Support; PND= Postnatal depression.

\*p<0.025, t<sup>#</sup>=Paired t-test.

## Differences in Maternal Parental Self-efficacy at three time points

Table 19 and Figure 5 shows that the maternal parental self-efficacy scores increased from baseline to posttest-1 in both intervention ( $t = -28.57, p < 0.001$ ) and control ( $t = -9.64, p < 0.001$ ) groups. Likewise from baseline to posttest-2 the maternal parental self-efficacy scores increased in both intervention ( $t = -23.88, p < 0.001$ ) and control ( $t = -17.75, p < 0.001$ ) groups. However, the increase in maternal parental self-efficacy scores at both posttests-1 and 2 for the intervention group was more than double of the control group (Table 19). The changes were statistically significant for both the intervention and the control group (Figure 5). However the increase in intervention group was major (more than double) as compared to control group.

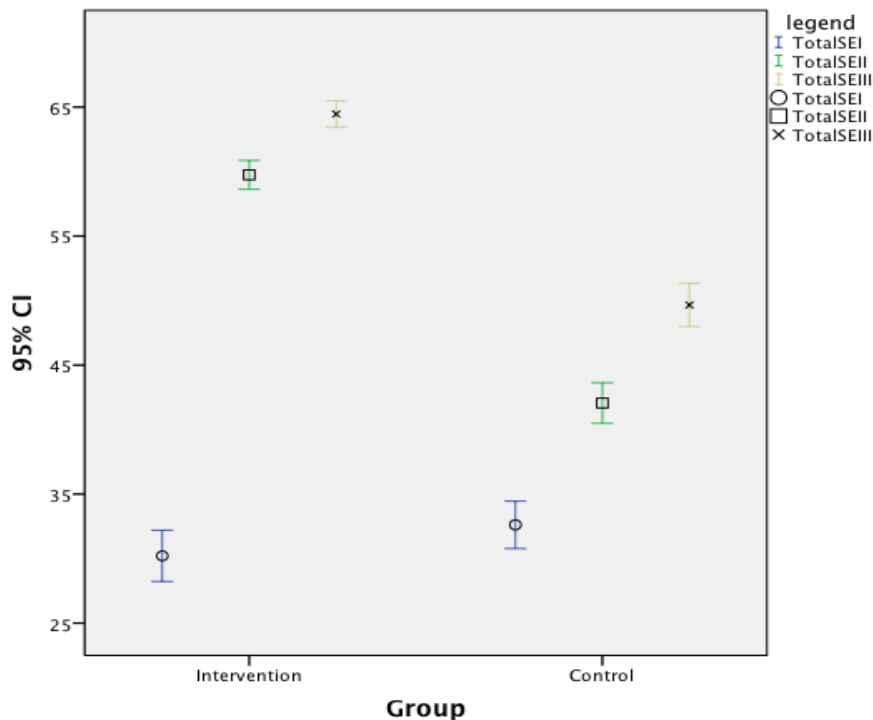


Figure 5. Error bars represent the 95% confidence interval of the maternal parental self-efficacy (MPSE) mean scores at baseline and posttests

Note: Total SEI= Baseline MPS-E mean score; Total SEII= Posttest-1 MPS-E mean score; Total SEIII= Posttest-2 MPS-E mean score.

## Differences in the Social Support at three time points

As shown in Table 19 and Figure 6, there was statistical significant increase in social support scores from baseline to posttest-1 ( $t = -34.30, p < 0.001$ ) and posttest-2 ( $t = -33.82, p < 0.001$ ) in the intervention group. However, for the control group, there was statistical significant decrease in social support scores from baseline to posttest-1 ( $t = 2.72, p = 0.009$ ) and no statistical significant difference in the social support scores from baseline to posttest-2 ( $t = -0.14, p = .989$ ).

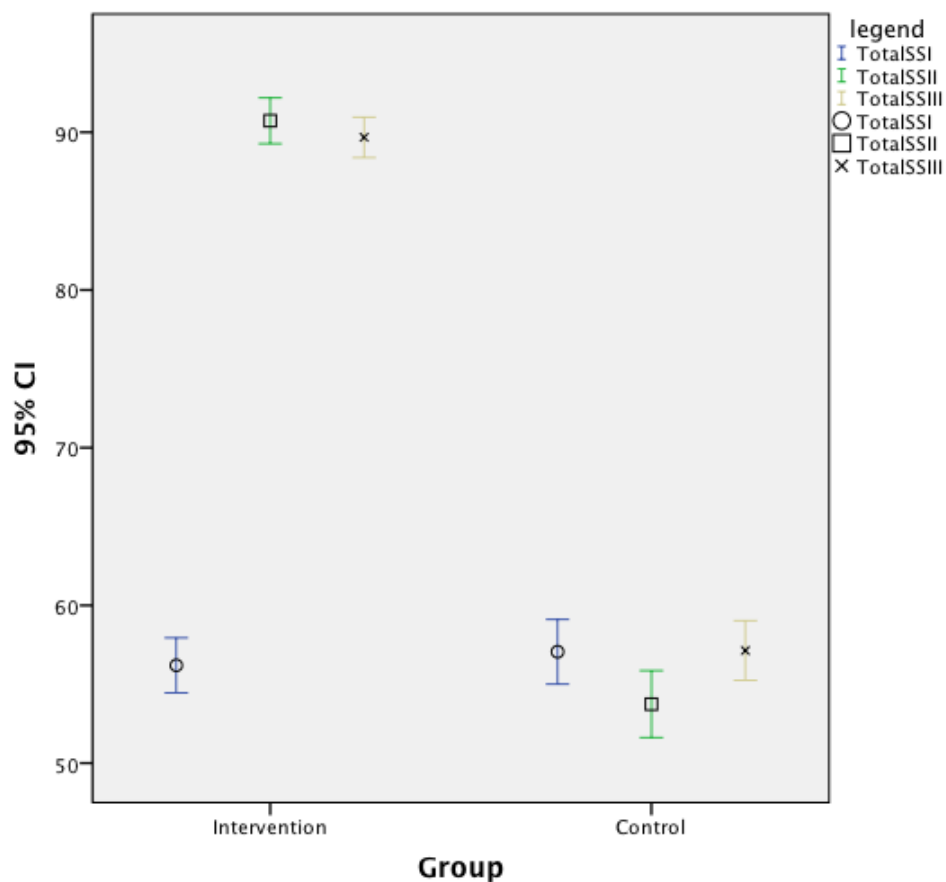


Figure 6. Error bars represent the 95% confidence interval of the social support (SS) mean scores at baseline and posttests

Note: Total SSI= Baseline Social Support mean score; Total SSII= Posttest-1 Social Support mean score; Total SSIII= Posttest-2 Social Support mean score.

## Differences in the postnatal depression at three time points

As shown in Table 19 and Figure 7, there was statistically significant decrease in postnatal depression scores from baseline to posttest-1 ( $t = 3.70, p < 0.001$ ) and posttest-2 ( $t = 8.72, p < 0.001$ ) for the intervention group. However, for the control group, there was statistically significant increase in postnatal depression scores from both the baseline to posttest-1 ( $t = -6.21, p < 0.001$ ) and posttest-2 ( $t = -2.54, p = 0.014$ ).

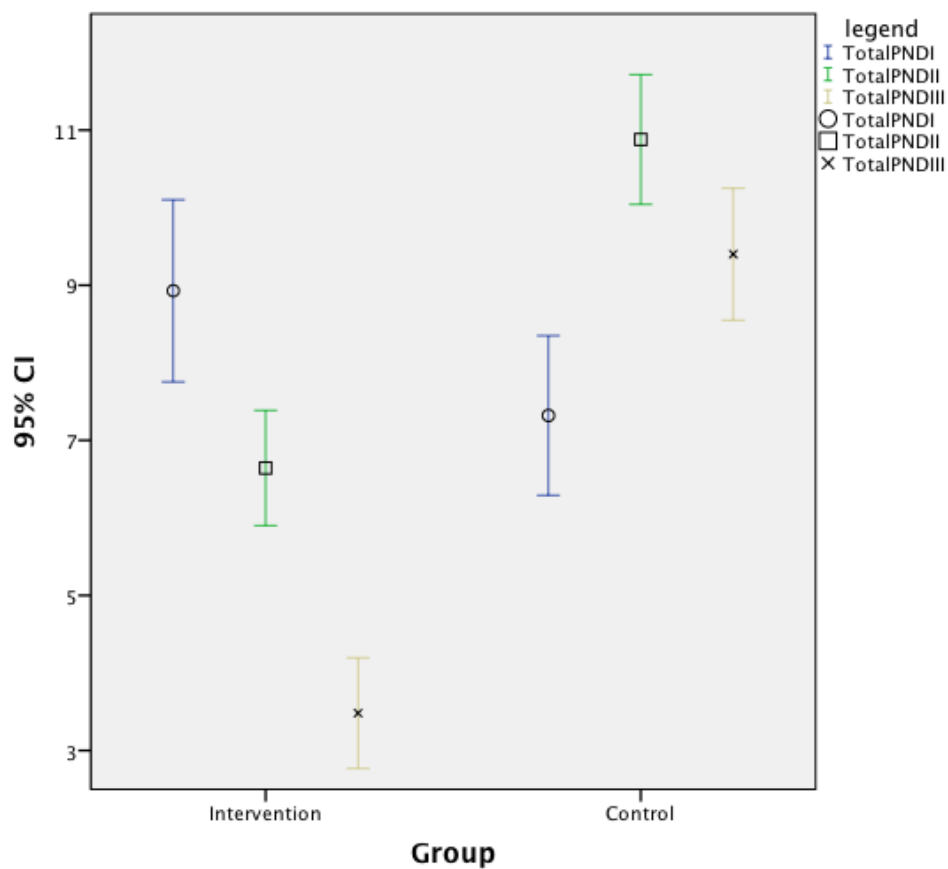


Figure 7. Error bars represent the 95% confidence interval of the postnatal depression (PND) mean scores at baseline and posttests

Note: Total PNDI= Baseline PND mean score; Total PNDII= Posttest-1 PND mean score; Total PNDIII= Posttest-2 PND mean score.

## Comparison of Maternal Parental Self-Efficacy, Social Support and Postnatal Depressive Symptoms between Groups Over Time

### Per Protocol Analysis

#### Results of Repeated Measures Triply MANOVA for Composite Outcome and Repeated Measures MANOVA for Individual Outcome (Per Protocol Analysis)

There were statistically significant differences in maternal parental self-efficacy between the intervention and control groups at baseline (Table 13). Hence the percentage changes were calculated for maternal parental self-efficacy, social support and postnatal depression at posttest-1 (at 6 weeks) and posttest-2 (at 12 weeks) from the baseline scores. Specifically, when there were statistically significant differences on the baseline MPSE scores between the control and intervention groups, baseline maternal parental self-efficacy, social support and postnatal depression scores were normalised to zero when repeated measures MANCOVA was performed. Such normalisation is used in statistics to conduct further analysis and test the hypothesis (Hughes, 2002). This is to allow the fair comparisons on the effectiveness of intervention across three-time points of data collection between the groups. Table 20 presents the percentage changes of all three variables between posttest-1 and baseline as well as between posttest-2 and baseline in both groups.

Table 20. Percentage changes of all three variables between posttest-1, posttest-2 and baseline in both groups

Measures	Baseline		Posttest-1		Posttest-2	
	Intervention Group (n = 61)	Control Group (n = 61)	Intervention Group (n = 56)	Control Group (n = 54)	Intervention Group (n = 57)	Control Group (n = 51)
MPSE	0.00	0.00	108.9 (5.4)	31.9 (5.7)	125.9 (6.0)	56.5 (6.5)
SS	0.00	0.00	63.5 (2.6)	-4.3 (2.8)	61.7 (2.6)	1.9 (2.8)
PND	0.00	0.00	9.9 (23.3)	105.9 (24.9)	-42.1 (19.0)	78.3 (20.3)

Note: MPSE= Maternal Parental Self-efficacy; SS=Social Support; PND= Postnatal depression

Posttest-1 mean percentage change = Mean at Posttest-1-Mean at Baseline/Mean at Baseline x 100

Posttest-2 mean percentage change = Mean at Posttest-2-Mean at Baseline/Mean at Baseline x 100

Comparison of Composite Outcome of Maternal Parental Self-Efficacy, Social Support and Postnatal Depression between Groups Over Time. As shown in Table 21, the repeated measures triply MANOVA yielded significant group effect on the composite outcomes of maternal parental self-efficacy, social support and postnatal depression [Wilks Lambda = 0.25,  $F(3, 101) = 103.2$ ,  $p < 0.001$ ,  $\eta^2 = .75$ ], indicating changes in the composite outcome variables differed significantly in mothers from the intervention group than those from the control group. The interventional group had greater improvements in maternal parental self-efficacy, social support and reduction in postnatal depression symptoms when compared with the control group (Table 20). The partial eta squared ( $\eta^2$ ) was 0.75 indicating a large effect ( $\geq 0.01$  means ‘small effect’,  $\geq 0.06$  means ‘medium effect’,  $\geq 0.14$  means ‘large effect’) (Pallant, 2007). The time effect on the composite outcomes of maternal parental self-efficacy, social support and postnatal depression was significant [Wilks Lambda = 0.14,  $F(6, 98) = 104.2$ ,  $p < 0.001$ ,  $\eta^2 = .87$ ], suggesting there were significant changes in the composite outcome variables across three measurements in both the intervention and control groups. There was significant interaction effect between group and time on the composite outcome variables in both the intervention and control groups [Wilks Lambda = 0.23,  $F(6,98) = 54.2$ ,  $p < 0.001$ ,  $\eta^2 = .77$ ] (Table 21). Thus, the hypothesis is one of significant improvement in the composite outcomes of maternal parental self-efficacy, social support and postnatal depression for intervention group as compared to the control group across three time points was accepted.

Table 21. Comparison of percentage change of composite scores from baseline in both groups over time<sup>a, b</sup>

Effects	Wilks' Lambda	df	F	$p$	$\eta^2$
Group effect	0.25	3,101	103.2	<0.001	.75
Time effect	0.14	6,98	104.2	<0.001	.87
Interaction effect (Group*Time)	0.23	6,98	54.2	<0.001	.77

Note: <sup>a</sup> Repeated measures triply MANOVA. <sup>b</sup> The Intention-to-treat analysis revealed similar results of significant differences in the composite outcomes of MPSE, SS and PND between the Intervention and control groups over three time points.

Comparisons of individual outcome of maternal parental self-efficacy, social support and postnatal depression between groups over time. Table 22 shows the results of repeated measures MANOVA of each individual outcome variable, which are described in the following sections separately. Bonferroni correction was used to adjust the significant level to 0.025 in order to control overall Type I error rate in consideration of comparisons between two groups over time for the outcome variables (Portney & Watkins, 2008).

Table 22. Comparison of percentage change of individual outcome of maternal parental self-efficacy, social support and postnatal depression between groups over time<sup>a, b</sup>

Outcome	Effect	df	F	$p$	$\eta^2$
Variables					
MPSE	Group effect	1,103	79.9	<0.001	.44
	Time effect	1,128	361.1	<0.001	.78
	Interaction effect (Group*Time)	1,128	71.0	<0.001	.41
SS	Group effect	1,103	310.7	<0.001	.75
	Time effect	2,160	221.8	<0.001	.68
	Interaction effect (Group*Time)	2,160	241.6	<0.001	.70
PND	Group effect	1,103	12.9	.001*	.11
	Time effect	1,135	9.6	.001*	.09
	Interaction effect (Group*Time)	1,135	11.1	.001*	.09

Note: MPSE= Maternal Parental Self-efficacy; SS=Social Support; PND= Postnatal depression.

\*  $p < 0.025$

# The Intention-to-treat analysis revealed similar results of significant differences in the univariate outcomes of MPSE, SS and PND between the intervention and control groups over time.

*Differences of maternal parental self-efficacy between groups over time.* The results revealed significant interaction effect between group and time on maternal parental self-efficacy [ $F(1,128) = 71.0, p < 0.001, \eta^2 = .41$ ] (Table 22). The mean percentage change of maternal parental self-efficacy increased from baseline to posttest-1 and posttest-2 in both the intervention and control groups (Figure 8). However, the intervention group had significantly better improvements in the maternal parental self-efficacy scores than the control group. There was also significant group effect [ $F(1,103) = 79.9, p < 0.001, \eta^2 = .44$ ] and time effect [ $F(1,128) = 361.1, p < 0.001, \eta^2 = .78$ ] on maternal parental self-efficacy (Table 22). Thus, hypothesis two on significant enhancement on MPSE scores for intervention group as compared to control group over time was accepted.

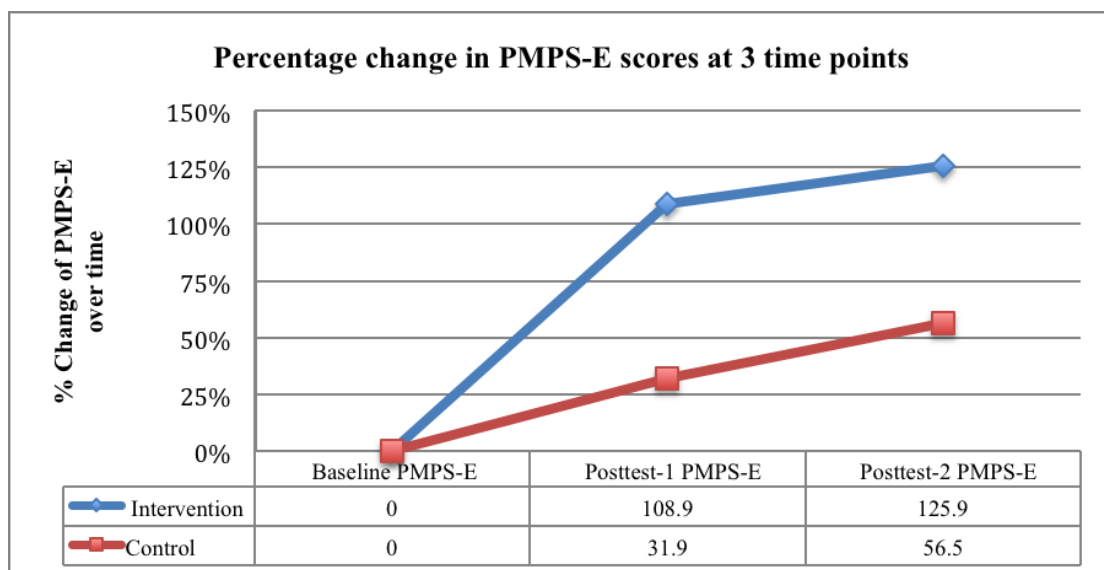


Figure 8. Mean percentage change of MPSE score from baseline to posttests

Note: Time 1= Baseline MPSE adjusted to zero; Time 2= MPSE mean percentage change at Posttest-1; Time 3= MPSE mean percentage change at Posttest-2



*Differences of social support between groups over time.* The results showed significant main effect of group [ $F(1,103) = 310.7, p < 0.001, \eta^2 = .75$ ], time [ $F(2,160) = 221.8, p < 0.001, \eta^2 = .68$ ] and interaction between group and time [ $F(2,160) = 241.6, p < 0.001, \eta^2 = .70$ ] on social support (Table 22). Therefore the hypothesis three of significant difference in social support between intervention and control groups over time was accepted. The mean percentage change of social support from baseline to both posttest-1 and posttest-2 increased in the intervention group. There was a slight decrease in mean percentage change of social support from posttest-1 to posttest-2 in intervention group. However, mothers in the control group had significant declines in social support from baseline to posttest-1 and increase in social support from posttest-1 to posttest-2 (Figure 9).

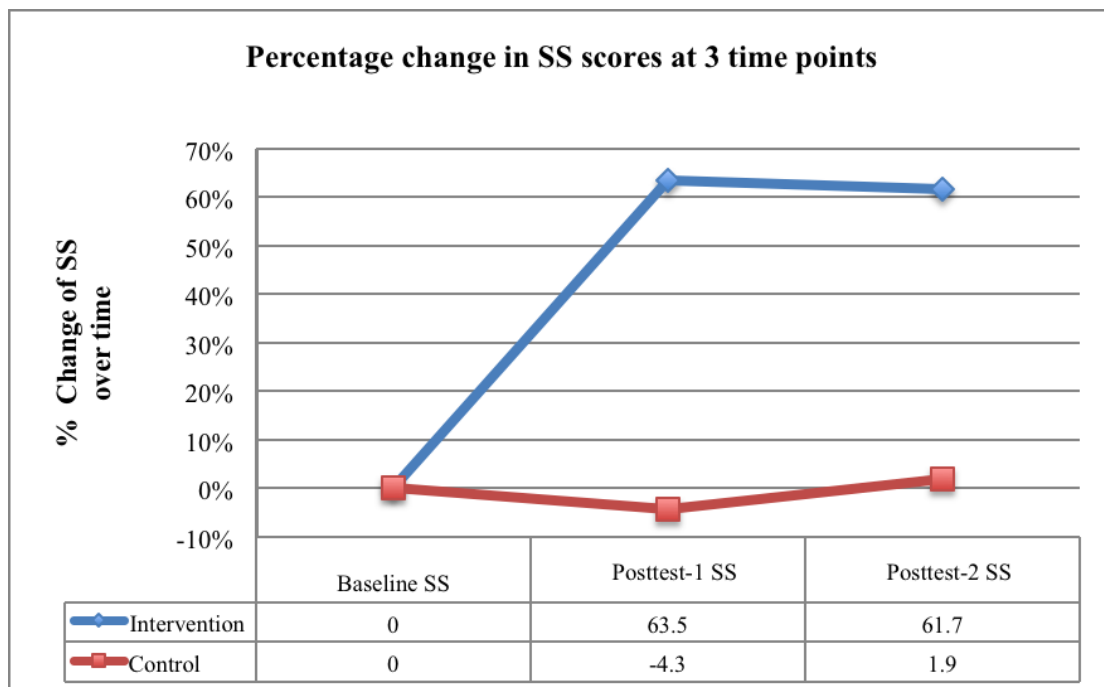


Figure 9. Mean percentage change of Social Support (SS) score from baseline to posttests.

Note: Time 1= Baseline SS adjusted to zero; Time 2= SS mean percentage change at Posttest-1; Time 3= SS mean percentage change at Posttest-2

*Differences of postnatal depression between groups over time.* As shown in Table 22, significant main effects of group [ $F(1,103) = 12.9, p = .001, \eta^2 = .11$ ], time [ $F(1,135) = 9.6, p = 0.001, \eta^2 = .09$ ] and interaction between group and time [ $F(1,135) = 11.1, p = .001, \eta^2 = .09$ ] (Table 22) were found on postnatal depression between groups over time. Therefore, the hypothesis four of significant reduction in postnatal depression for intervention group as compared to the control group across time was accepted. The mean percentage change of postnatal depression from baseline to posttest-1 increased in both intervention and control group. However, the increase in intervention group was slight. There was significant decrease in mean percentage change of postnatal depression from baseline to posttest-2 for the mothers in intervention group; however, there was an increase from the baseline to posttest-2, for the mothers in the control group (Figure 10).

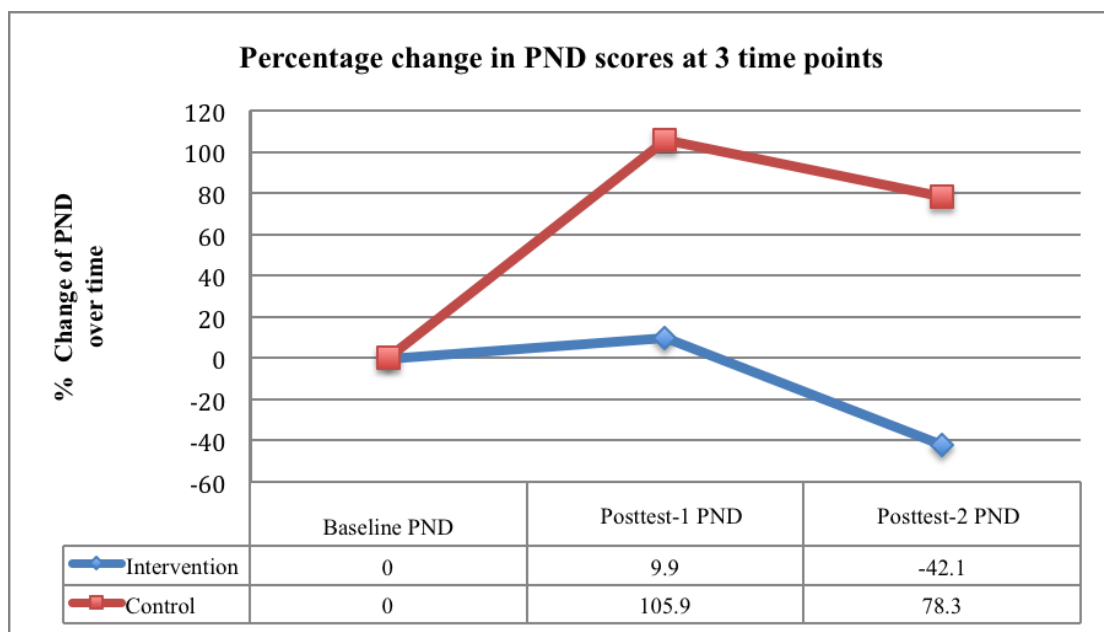


Figure 10. Mean percentage change of postnatal depression (PND) score from baseline to posttests

Note: Time 1= Baseline PND adjusted to zero; Time 2= PND mean percentage change at Posttest-1; Time 3= PND mean percentage change at Posttest-2.

## Results of Repeated Measures Triply MANCOVA for Composite Outcome and Repeated Measures MANCOVA for Individual Outcome (Per Protocol Analysis)

There could be potential confounding effects of the demographic characteristics such as age, ethnicity, marital status, educational level, employment status, monthly house income, antenatal class attendance and type of birth on outcome variables including maternal parental self-efficacy, social support and postnatal depression. Hence, they were entered into the analysis as covariates to control for their confounding effects on the outcome variables before testing the intervention effects using repeated measures triply MANCOVA. The adjusted baseline and percentage change posttests means and standard errors for the outcome variables are presented in table 23.

Comparison of composite outcome of maternal parental self-efficacy, social support and postnatal depression between groups over time. The repeated measures triply MANCOVA yielded significant main effect of group on the composite outcome of maternal parental self-efficacy, social support and postnatal depressive [Wilks Lambda = 0.26,  $F(3, 90) = 86.8$ ,  $p < 0.001$ ,  $\eta^2 = .74$ ], indicating changes in the composite outcome variables differed significantly between the intervention group and the control group (Table 24). The intervention group had significantly greater improvements in maternal parental self-efficacy, social support and postnatal depression than the control group (Table 23). The partial eta squared ( $\eta^2$ ) was 0.74 indicating a large effect of the PPP (Pallant, 2007).

The time effect on the composite outcome of maternal parental self-efficacy, social support and postnatal depression was not significant [Wilks Lambda = 0.93,  $F(6, 87) = 1.08$ ,  $p = .38$ ,  $\eta^2 = .07$ ]. However, there was significant interaction effect between group and time on the composite outcome variables [Wilks Lambda = 0.24,  $F(6, 87) = 46.7$ ,  $p < 0.001$ ,  $\eta^2 = .76$ ] (Table 24). This suggested there were significant changes in the composite outcome variables between groups over time. Thus, the hypothesis one of significant differences in the composite outcomes of maternal parental self-efficacy, social support and postnatal depression between groups across the three time points was accepted.

Table 23. Percentage changes of all three variables between posttest-1, posttest-2 and baseline in both groups after adjusted for demographics and clinical characteristics

Measures	Baseline		Posttest-1		Posttest-2	
	Intervention Group (n = 61)	Control Group (n = 61)	Intervention Group (n = 56)	Control Group (n = 54)	Intervention Group (n = 57)	Control Group (n = 51)
MPSE	0.00	0.00	120.0 (11.2)	42.4 (10.7)	137.9 (12.3)	67.5 (11.8)
SS	0.00	0.00	70.7 (5.3)	3.0 (5.1)	68.6 (5.5)	9.6 (5.3)
PND	0.00	0.00	-17.7 (49.8)	86.8 (47.8)	-85.6 (40.3)	37.1 (38.7)

Note: MPSE= Maternal Parental Self-efficacy; SS=Social Support; PND= Postnatal depression

Posttest-1= At six weeks postpartum (Immediately after the intervention)

Posttest-2=At 12 weeks postpartum

Table 24. Comparison of percentage change of composite scores from baseline in both groups over time <sup>a, b</sup>

Effects	Wilks' Lambda	df	F	$p$	$\eta^2$
Group effect	0.26	3,90	86.8	<0.001	.74
Time effect	0.93	6,87	1.08	.38	.07
Interaction effect (Group*Time)	0.24	6,87	46.7	<0.001	.76

Note: <sup>a</sup> Repeated measures triply MANCOVA adjusted for demographic and clinical characteristics of age, ethnicity, marital status, educational level, employment status, monthly household income, antenatal class attendance and type of birth. <sup>b</sup> The Intention-to-treat analysis revealed similar results of significant differences in the composite outcome of MPSE, SS and PND between the intervention and control groups over time.

Comparisons of individual outcome of maternal parental self-efficacy, social support and postnatal depression between groups over time. Table 25 shows the results of repeated measures MANCOVA of each outcome variable, which are described in the following sections separately. Bonferroni correction was used to adjust the significant level to 0.025 in order to control overall Type I error rate in consideration of comparisons for the outcome variables (Portney & Watkins, 2009).

Table 25. Comparison of percentage change of individual outcome of maternal parental self-efficacy, social support and postnatal depression between groups over time<sup>a, b</sup>

Outcome Variables	Effect	df	F	$p$	$\eta^2$
MPSE	Group effect	1,92	72.8	<0.001*	.44
	Time effect	1 115	2.4	.12	.03
	Interaction effect (Group*Time)	1,115	64.6	<0.001*	.41
SS	Group effect	1,92	258.9	<0.001*	.74
	Time effect	1,135	1.8	.18	.02
	Interaction effect (Group*Time)	1,135	210.3	<0.001*	.69
PND	Group effect	1,92	11.7	.001*	.11
	Time effect	1,118	.18	.74	.00
	Interaction effect (Group*Time)	1,118	10.0	.001*	.09

Note: MPSE= Maternal Parental Self-efficacy; SS=Social Support; PND= Postnatal depression. \* $p$  <0.025.

<sup>a</sup> Repeated measures MANCOVA adjusted for demographic characteristics of age, ethnicity, marital status, educational level, employment status, monthly household income, antenatal class attendance and type of birth. <sup>b</sup> The Intention-to-treat analysis revealed similar results of significant differences in the univariate outcomes of MPSE, SS and PND between the intervention and control groups over time.

*Differences in maternal parental self-efficacy between groups over time.* The Repeated measures MANCOVA analysis revealed significant interaction effect between group and time on maternal parental self-efficacy [ $F(1,115) = 64.6, p < 0.001, \eta^2 = .41$ ] (Table 25). The mean percentage change of maternal parental self-efficacy, after adjusted by demographics and clinical characteristics, increased from baseline to posttest-1 and posttest-2 in both the Intervention and control groups (Figure 11). However, there was significantly better improvement in the maternal parental self-efficacy scores in the intervention group when compared with the control group over time. Hence, the hypothesis two of significant difference in maternal parental self-efficacy between groups across the three time periods (baseline, posttest-1 and posttest-2) was accepted (Table 25).

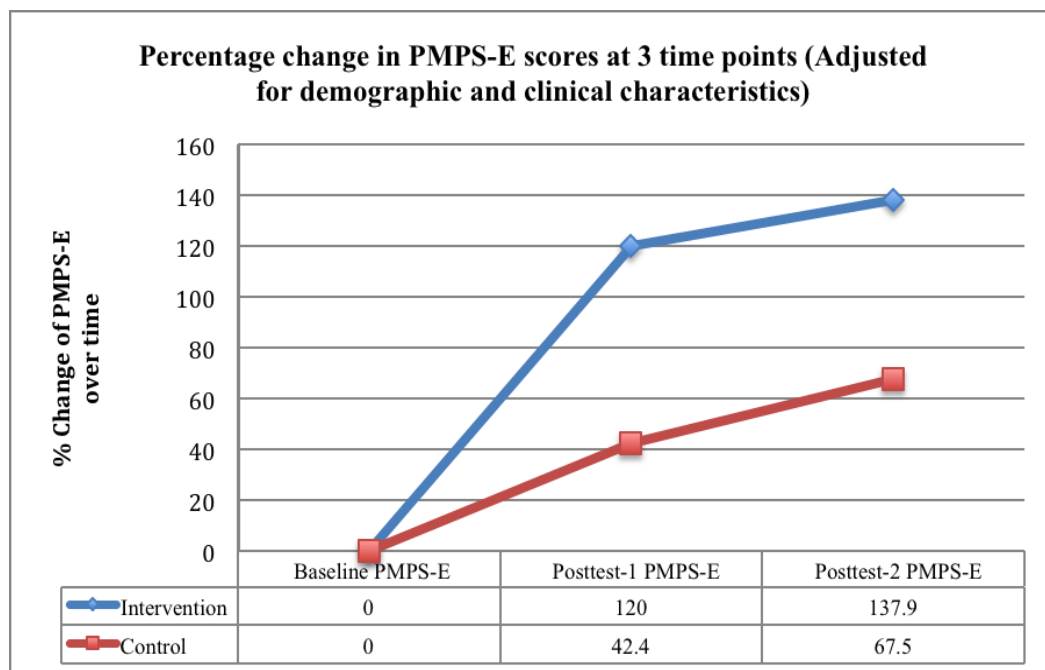


Figure 11. Mean percentage change of MPSE score from baseline to posttests

Note: Time 1= Baseline MPSE adjusted to zero; Time 2= MPSE mean percentage change at Posttest-1; Time 3= MPSE mean percentage change at Posttest-2.

*Differences in social support between groups over time.* Table 25 shows that significant group effect [ $F(1,92) = 258.9, p < 0.001, \eta^2 = .74$ ] and interaction between group and time [ $F(1,135) = 210.3, p < 0.001, \eta^2 = .69$ ] on social support. There was no significant time effect on social support [ $F(1,135) = 1.8, p = .18, \eta^2 = .02$ ] on social support. Therefore, the hypothesis three of significant difference in social support between intervention and control groups over time was accepted. The mean percentage change of social support, after being adjusted by demographics, from baseline to both posttest-1 and posttest-2 increased significantly in the intervention group. There was a slight decrease in mean percentage change from posttest-1 to posttest-2 in the intervention group (Figure 12). The mothers in the control group had significant increase in social support from baseline to posttest-1 and from baseline to posttest-2 as well as from posttest-1 to posttest-2 (Figure 12).

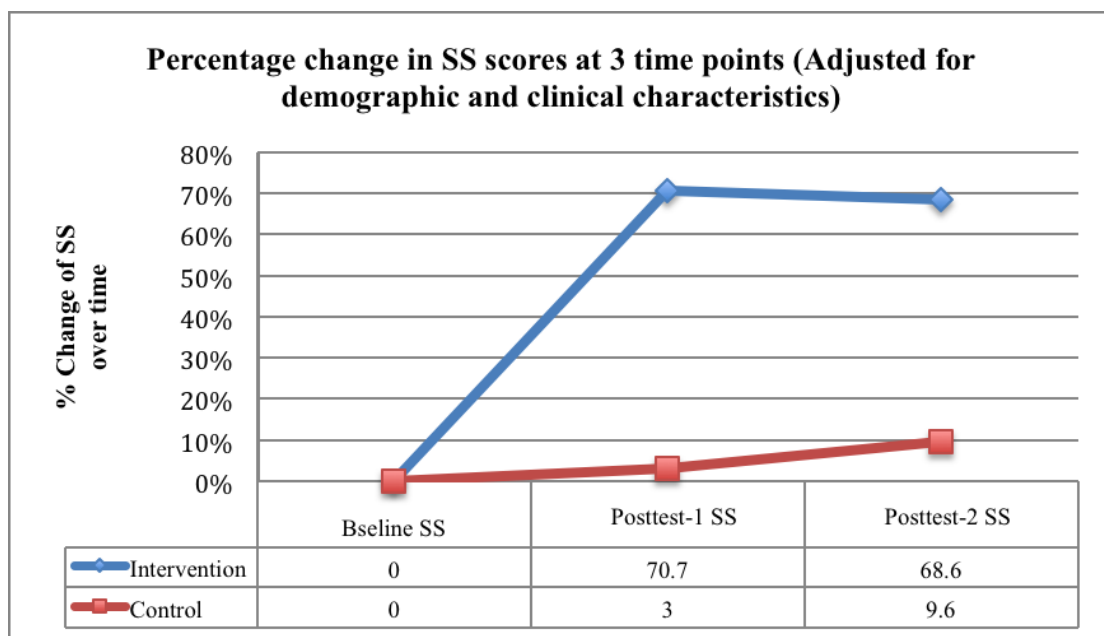


Figure 12. Mean percentage change of Social Support (SS) score from baseline to posttests

Note: Time 1= Baseline SS adjusted to zero; Time 2= SS mean percentage change at Posttest-1; Time 3= SS mean percentage change at Posttest-2

*Differences in postnatal depression between groups over time.* The results revealed significant group effect [ $F(1,92) = 11.7, p = .001, \eta^2 = .11$ ], and interaction effect between group and time [ $F(1,118) = 10, p = .001, \eta^2 = .09$ ] (Table 25). Therefore, the hypothesis four of significant difference in postnatal depression between intervention and control groups over time was accepted. The mean percentage change of postnatal depression from baseline to posttest-1 and from baseline to posttest-2 as well as from posttest-1 to posttest-2 decreased significantly in the intervention group. However, in the control group there was significant increase in mean percentage change of postnatal depression both from baseline to posttest-1 and from baseline to posttest-2. (Figure 13).

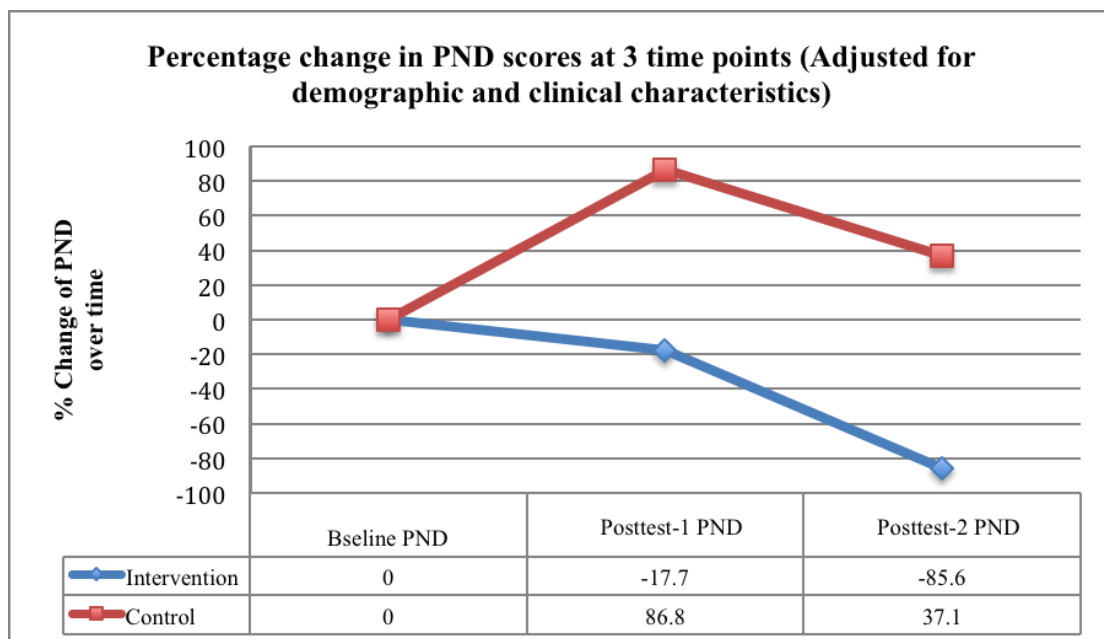


Figure 13. Mean percentage change of postnatal depression (PND) score from baseline to posttests

Note: Time 1= Baseline PND adjusted to zero; Time 2= PND mean percentage change at Posttest-1; Time 3= PND mean percentage change at Posttest-2.

In summary, both repeated measures triply MANOVA and MANCOVA for composite analysis and repeated measures MANOVA and MANCOVA for individual analysis of outcome variables had similar results. That is, there are statistically significant improvements in maternal parental self-efficacy and social support scores and reduction in postnatal depression scores in the intervention group when compared with control group across three time points both unadjusted and adjusted for demographic variables.



## Comparison of Maternal Parental Self-Efficacy, Social Support and Postnatal Depressive Symptoms between Groups across Time

### Intention-to-treat (ITT) Analysis

#### Results of Repeated Measures Triply MANOVA for Composite Outcome and Repeated Measures MANOVA for Individual Outcome (ITT Analysis)

ITT analysis was also performed with 122 participants with 61 participants each in the intervention and control groups. The missing values were replaced by two methods: imputation by means and the carried forward last values. Analysis on both type of data revealed findings that concurred with those using per-protocol analysis presented in the previous sections.

Repeated Measures Triply MANOVA using imputation by mean method. Using the ITT analysis where the missing values were replaced by means, there was significant main effect of group [ $F(3,118) = 99.8, p < 0.001, \eta^2 = .72$ ], time [ $F(6,115) = 127.6, p < 0.001, \eta^2 = .87$ ] and interaction between group and time [ $F(6,115) = 51.6, p < 0.001, \eta^2 = .73$ ] on the composite outcome of maternal parental self-efficacy, social support and postnatal depression (Table 26).

Table 26: Comparison of percentage change of composite scores from baseline in both groups over time (ITT analysis, Imputation by mean)<sup>a</sup> (n = 122)

Effects	Wilks' Lambda	df	F	$p$	$\eta^2$
Group effect	0.28	3,118	99.8	<0.001	.72
Time effect	0.13	6,115	127.6	<0.001	.87
Interaction effect (Group*Time)	0.27	6,115	51.6	<0.001	.73

Note: <sup>a</sup> Repeated measures triply MANOVA.

As shown in Table 27, the repeated measures MANOVA (Individual analysis) revealed significant main effect of group, time and interaction between group and time on maternal parental self-efficacy, social support and postnatal depression.

Table 27: Comparison of percentage change of individual outcome of maternal parental self-efficacy, social support and postnatal depression between groups over time (ITT analysis, Imputation by mean)<sup>a</sup>

Outcome Variables	Effect	df	F	<i>p</i>	$\eta^2$
MPSE	Group effect	1,120	92.2	<0.001	.44
	Time effect	1,152	446.5	<0.001	.79
	Interaction effect (Group*Time)	1,152	80.9	<0.001	.40
SS	Group effect	1,120	292.5	<0.001	.71
	Time effect	2,205	230.9	<0.001	.66
	Interaction effect (Group*Time)	2,205	210.1	<0.001	.64
PND	Group effect	1,120	10.5	<0.001	.08
	Time effect	1,156	10.6	.001 <sup>*</sup>	.08
	Interaction effect (Group*Time)	1,156	9.2	.001 <sup>*</sup>	.07

Note: MPSE= Maternal Parental Self-efficacy; SS=Social Support; PND= Postnatal depression, <sup>\*</sup>*p*<0.025; <sup>a</sup>Repeated measures MANOVA.

Repeated Measures Triply MANOVA using imputation by last value carried forward method. For the ITT analysis where the missing values were replaced by last value carried forward method, there was also significant main effect of group [F (3,117) = 84.5, *p* < 0.001,  $\eta^2$  = .68], time [F (6,114) = 71.3, *p* < 0.001,  $\eta^2$  = .79] and interaction between group and time [F (6,114) = 41.8, *p* < 0.001,  $\eta^2$  = .69] on the composite outcomes of maternal parental self-efficacy, social support and postnatal depression (Table 28).

Table 28. Comparison of percentage change of composite scores from baseline in both groups over time (ITT analysis, Imputation by last value carried forward)<sup>a</sup>

Effects	Wilks' Lambda	df	F	<i>p</i>	$\eta^2$
Group effect	0.32	3,118	84.5	<0.001	.68
Time effect	0.21	6,115	71.3	<0.001	.79
Interaction effect (Group*Time)	0.31	6,115	41.8	<0.001	.69

Note: <sup>a</sup>Repeated measures triply MANOVA.

Individual analysis of different outcomes also revealed significant main effect of group, time and interaction between group and time maternal parental self-efficacy, social support and postnatal depression (Table 29).

Table 29. Comparison of percentage change of individual outcome of maternal parental self-efficacy, social support and postnatal depression between groups over time (ITT analysis, Imputation by last value carried forward method)

Outcome Variables	Effect	df	F	<i>p</i>	$\eta^2$
MPSE	Group effect	1,120	74.5	<0.001	.38
	Time effect	1,152	288.9	<0.001	.71
	Interaction effect (Group*Time)	1,152	64.9	<0.001	.35
SS	Group effect	1,120	256.5	<0.001	.68
	Time effect	2,184	173.3	<0.001	.59
	Interaction effect (Group*Time)	2,184	200.2	<0.001	.63
PND	Group effect	1,120	12.4	.001 <sup>*</sup>	.09
	Time effect	1,157	9.3	.001 <sup>*</sup>	.07
	Interaction effect (Group*Time)	1,157	10.8	<0.001	.08

Note: MPSE= Maternal Parental Self-efficacy; SS=Social Support; PND= Postnatal depression.

<sup>\*</sup>p<0.025; <sup>a</sup> Repeated measures MANOVA.

### Results of Repeated Measures Triply MANCOVA for Composite Outcome and Repeated Measures MANCOVA for Individual Outcome (ITT Analysis)

The demographic variables were entered into the analysis as covariates to control for their confounding effects on the outcome variables before testing the intervention effects using repeated measures triply MANCOVA. The ITT analysis of triply MANCOVA both for imputation by mean and last value carried forward methods revealed findings that concurred with those using per-protocol analyses presented in the previous sections.

Repeated Measures Triply MANCOVA using imputation by mean method. For the ITT analysis where the missing values were replaced by means, there was significant main effect of group [ $F(3,107) = 83.2, p < 0.001, \eta^2 = .70$ ], and interaction between group and time [ $F(6,104) = 43.1, p < 0.001, \eta^2 = .71$ ] on the composite outcomes of maternal parental self-efficacy, social support and postnatal depression. However there was no time effect within the groups (Table 30)

Table 30. Comparison of percentage change of composite scores from baseline in both groups over time (ITT analysis, Imputation by mean)<sup>a</sup>

Effects	Wilks' Lambda	df	F	$p$	$\eta^2$
Group effect	0.30	3,107	83.2	<0.001	.70
Time effect	0.96	6,104	0.75	.609	.04
Interaction effect (Group*Time)	0.23	6,104	43.1	<0.001	.71

Note: <sup>a</sup>Repeated Measures Triply MANCOVA adjusted for demographic characteristics such as age, ethnicity, marital status, educational level, employment status, monthly household income, antenatal class attendance and type of birth.

Individual analysis of outcome variables revealed significant main effect of group and interaction between group and time but not of time on maternal parental self-efficacy, social support and postnatal depression, just as per protocol analysis (Table 31).

Table 31. Comparison of percentage change of individual outcome of maternal parental self-efficacy, social support and postnatal depression between groups over time (ITT analysis, Imputation by mean)<sup>a</sup>

Outcome Variables	Effect	df	F	<i>p</i>	$\eta^2$
MPSE	Group effect	1,109	77.7	<0.001	.42
	Time effect	1,139	1.7	.19	.02
	Interaction effect (Group*Time)	1,139	68.3	<0.001	.39
SS	Group effect	1,109	244.0	<0.001	.69
	Time effect	2,180	1.6	.20	.02
	Interaction effect (Group*Time)	2,180	181.7	<0.001	.63
PND	Group effect	1,109	8.8	.004*	.08
	Time effect	1,140	.14	.78	.00
	Interaction effect (Group*Time)	1,140	7.6	.003*	.07

Note: MPSE= Maternal Parental Self-efficacy; SS=Social Support; PND= Postnatal depression.

\**p*<0.025;

<sup>a</sup> Repeated Measures MANCOVA adjusted for demographic characteristics such as age, ethnicity, marital status, educational level, employment status, monthly household income, antenatal class attendance and type of birth

Repeated Measures Triply MANCOVA using imputation by last value carried forward method. For the ITT analysis where the missing values were replaced by last value carried forward method, there was also significant main effect of group [F (3,107) = 71.9, *p* < 0.001,  $\eta^2$  = .67], and interaction between group and time [F (6,104) = 35.6, *p* < 0.001,  $\eta^2$  = .67] but no time effect on the composite outcomes of maternal parental self-efficacy, social support and postnatal depression (Table 32) as per the per protocol analysis as well as ITT for imputation by mean methods.

Table 32: Comparison of percentage change of composite scores from baseline in both groups over time (ITT analysis, Imputation by last value carried forward) <sup>a</sup>

Effects	Wilks' Lambda	df	F	<i>p</i>	$\eta^2$
Group effect	0.33	3,107	71.9	<0.001	.67
Time effect t	0.98	6,104	.37	.89	.02
Interaction effect (Group*Time)	0.33	6,104	35.6	<0.001	.67

Note: <sup>a</sup> Repeated measures triply MANOVA adjusted for demographic characteristics such as age, ethnicity, marital status, educational level, employment status, monthly household income, antenatal class attendance and type of birth.

Individual analysis also revealed significant main effect of group and interaction between group and time but no time effect on maternal parental self-efficacy, social support and postnatal depression (Table 33).

Table 33. Comparison of percentage change of individual outcome of maternal parental self-efficacy, social support and postnatal depression between groups over time (ITT analysis, Imputation by last value carried forward method)

Outcome Variables	Effect	df	F	<i>p</i>	$\eta^2$
MPSE	Group effect	1,109	65.0	<0.001	.38
	Time effect	1,137	.74	.42	.01
	Interaction effect (Group*Time)	1,137	57.0	<0.001	.34
SS	Group effect	1,109	218.5	<0.001	.68
	Time effect	1,157	.50	.55	.01
	Interaction effect (Group*Time)	1,157	178.5	<0.001	.62
PND	Group effect	1,109	10.9	.001*	.09
	Time effect	1,141	.16	.75	.00
	Interaction effect (Group*Time)	1,141	9.4	.001*	.08

Note: MPSE= Maternal Parental Self-efficacy; SS=Social Support; PND= Postnatal depression. \**p*<0.025. <sup>a</sup> Repeated measures triply MANOVA adjusted for demographic characteristics such as age, ethnicity, marital status, educational level, employment status, monthly household income, antenatal class attendance and type of birth.

In conclusion, the ITT analysis by both mean and last value carried forward methods for repeated measure triply MANOVA and MANCOVA found similar results. Similarly, the ITT analysis by both mean and last value carried forward methods for repeated measure MANOVA and MANCOVA for individual outcome found similar results as well. There was statistically significant better increase in maternal parental self-efficacy and social support scores and decrease in postnatal depression scores from baseline to posttest-1 and posttest-2 for intervention group when compared to control group both un-adjusted and adjusted for demographic variables. Though both imputation by mean and last value carried forward are single imputation methods, but the last value carried forward is more stringent criteria in evaluating the effectiveness of an intervention. Hence, the results from imputation by last value carried forward method were elaborated in the discussion chapter.

#### Comparisons of Maternal Parental Self-Efficacy, Social Support and Postnatal Depression between Groups at 6 weeks (Per Protocol Analysis)

MANOVA and MANCOVA were used to examine the differences in the outcome variables including, maternal parental self-efficacy, social support and postnatal depression between the intervention and the control groups immediately after the intervention at six weeks postpartum (posttest-1). The statistically significant differences were found for maternal parental self-efficacy [ $F(1,107) = 106.7, p < 0.001$ ] social support [ $F(1,107) = 349.7, p < 0.001$ ] and postnatal depression [ $F(1,107) = 8.1, p = .001$ ] between intervention and control groups at six weeks postpartum (Table 34). When adjusted for demographic characteristics such as age, ethnicity, marital status, educational level, employment status, monthly house income, antenatal class attendance and type of birth, the significant differences were also found for maternal parental self-efficacy [ $F(1,96) = 93.8, p < 0.001$ ] social support [ $F(1,96) = 311.9, p < 0.001$ ] and postnatal depression [ $F(1,96) = 7.7, p = .007$ ] between intervention and control groups at six weeks postpartum (Table 35). Therefore, the hypothesis five of improved maternal parental self-efficacy, social support and reduced postnatal depression at six weeks postpartum was accepted.

Table 34. Comparison of mean percentage change of all outcome variables between the intervention and control groups (MANOVA) at posttest-1<sup>#</sup> (n=110)

Groups	Measures	Mean percentage change at 6 weeks	Mean Difference (%)	df	F	<i>p</i>	95 % Confidence Interval for Differences (%)	
		Mean (SD)	Mean (SD)				Lower Bound	Upper Bound
Intervention (n=56)	MPSE	108.9 (5.3)	78.4 (7.6)	1,107	106.7	<0.001	63.3	93.4
					349.7	<0.001	61.2	75.7
	SS	63.5 (2.6)	68.5 (3.7)	1,107	8.1	.001*	-159.3	-28.4
	PND	9.9 (23.0)	-93.9 (33.0)	1,107				
Control (n=54)	MPSE	30.6 (5.4)						
	SS	-5.0 (2.6)						
	PND	103.8 (23.7)						

Note: MPSE= Maternal Parental Self-efficacy; SS=Social Support; PND= Postnatal depression. \**p*<0.05.

<sup>#</sup> The ITT analysis revealed similar results of significant differences in the univariate outcomes of MPSE, SS and PND between the Intervention and control groups at 6 weeks postpartum.



Table 35. Comparison of mean percentage change of all outcome variables between the intervention and control groups by adjusting for demographic characteristics (MANCOVA) at posttest-1 (n=110)

Groups	Measures	Mean percentage change at 6 weeks	Mean Difference (%)	df	F	<i>p</i>	95 % Confidence Interval for Differences (%)	
		Mean (SD)	Mean (SD)				Lower Bound	Upper Bound
Intervention (n=56)	MPSE	120.7 (10.8)	78.3 (8.1)	1,96	93.8	<0.001*	62.3	94.4
	SS	70.9 (5.2)	68.2 (3.9)	1,96	311.9	<0.001*	60.5	75.8
	PND	-15.9 (48.3)	-100.2 (36.1)	1,96	7.7	.007*	-171.9	-28.5
Control (n=54)	MPSE	42.3 (10.5)						
	SS	2.8 (5.0)						
	PND	84.3 (47.0)						

Note. Covariates appearing in the model are evaluated at the following values: Age=28.7

MPSE= Maternal Parental Self-efficacy; SS=Social Support; PND= Postnatal depression. \**p*<0.05

# The ITT analysis revealed similar results of significant differences in the univariate outcomes of MPSE, SS and PND when adjusted for demographic characteristics, between the intervention and control groups at 6 weeks postpartum

### Comparisons of Maternal Parental Self-Efficacy, Social Support and Postnatal Depression between Groups at 12 weeks (Per Protocol Analysis)

To examine the differences in the outcome variables including, maternal parental self-efficacy, social support and postnatal depression between the intervention and the control groups at 12 weeks postpartum (posttest-2), MANOVA and MANCOVA were used. Statistically significant differences were found for maternal parental self-efficacy [ $F(1,105) = 49.6, p < 0.001$ ], social support [ $F(1,105) = 255.8, p < 0.001$ ] and postnatal depression [ $F(1,105) = 17.8, p < 0.001$ ] between intervention and control groups at posttest-2 (Table 36). When adjusted for demographic characteristics such as age, ethnicity, marital status, educational level, employment status, monthly house income, antenatal class attendance and type of birth, the significant differences were maintained for maternal parental self-efficacy [ $F(1,94) = 41.8, p < 0.001$ ], social support [ $F(1,94) = 209.5, p < 0.001$ ] and postnatal depression [ $F(1,94) = 14.4, p < 0.001$ ] between Intervention and control groups at posttest-2 (Table 37). Hence, hypothesis six of improved maternal parental self-efficacy, social support and reduced postnatal depression at 12 weeks postpartum was accepted.

Table 36. Comparison of mean percentage change of all outcome variables between the intervention and control groups (MANOVA) at posttest-2 # (n=108)

Groups	Measures	Mean percentage change at 12 weeks	Mean Difference (%)	df	F	$\rho$	95 % Confidence Interval for Differences (%)	
		Mean (SD)	Mean (SD)				Lower Bound	Upper Bound
Intervention (n=57)	MPSE	122.5 (6.4)	66.3 (9.4)	1,105	49.6	<0.001**	47.6	84.9
	SS	61.9 (2.6)	60.1 (3.8)	1,105	255.8	<0.001**	52.7	67.6
	PND	-40.5 (18.8)	-116.0 (27.5)	1,105	17.8	<0.001**	-170.5	-61.5
Control (n=51)	MPSE	56.2 (6.9)						
	SS	1.8 (2.7)						
	PND	75.5 (20.1)						

Note: MPSE= Maternal Parental Self-efficacy; SS=Social Support; PND= Postnatal depression. \* $\rho$ <0.01. # The ITT revealed similar results of significant differences in the univariate outcomes of MPSE, SS and PND between the intervention and control groups at 12 weeks postpartum.

Table 37. Comparison of mean percentage change of all outcome variables between the intervention and control groups after adjusting for demographic characteristics (MANCOVA) at posttest-2<sup>#</sup> (n=108)

Groups	Measures	Mean change at	Mean Difference	df	F	<i>p</i>	95 % Confidence Interval	
		12 weeks	(%)				for Differences (%)	
		Mean (SD)	Mean (SD)				Lower Bound	Upper Bound
Intervention (n=57)	MPSE	114.2 (12.2)	64.6 (10.0)	1,94	41.8	<0.001**	44.8	84.5
	SS	67.7 (4.9)	58.8 (4.1)	1,94	209.5	<0.001**	50.8	66.9
	PND	-62.4 (36.7)	-113.9 (30.1)	1,94	14.4	<0.001**	-173.6	-54.2
Control (n=51)	MPSE	42.3 (10.5)						
	SS	2.8 (5.0)						
	PND	84.3 (47.0)						

Note. Covariates appearing in the model are evaluated at the following values: Age=28.7

MPSE= Maternal Parental Self-efficacy; SS=Social Support; PND= Postnatal depression. *p*<0.01.

<sup>#</sup> The ITT analysis revealed similar results of significant differences in the univariate outcomes of MPSE, SS and PND when adjusted for demographic characteristics, between the Intervention and control groups at 12 weeks postpartum.

## Results of Satisfaction Level with the Intervention Programme and the Routine Postnatal Support

The participants in the intervention group were asked on their satisfaction level with the intervention, the postnatal psychoeducation programme (PPP) and overall postnatal support received immediately after the intervention at six weeks postpartum. The control group participants were also asked at six weeks postpartum on their satisfaction level with the routine postnatal support they received from the hospital. The data were analysed with 56 participants in the intervention group and 54 in the control group. The response rates in both the groups were 100%. All the participants in the intervention group were satisfied with the PPP intervention (100%) and the majority of the participants in the control group were satisfied with the routine postnatal supportive care (91%) (Table 38).

A chi square test was conducted to compare the satisfaction levels between the intervention and the control groups. The significant differences were found in the satisfaction levels ( $\chi^2 = 5.4^F$ ,  $df = 1$ ,  $p = 0.026$ ) of the two groups (Table 38). Thus the hypothesis seven of significant difference in the satisfaction level among first-time mothers who receive PPP and postnatal routine care and those only receiving the postnatal routine care, was accepted.

Table 38. Comparison of satisfaction levels between the intervention and control groups

Groups	Satisfied	Not Satisfied	$\chi^2$	$p$
	n	n		
Intervention (n=56)	56	0	5.4 <sup>F</sup>	.026 <sup>*</sup>
Control (n=54)	49	5		

Note: <sup>F</sup>=Fisher's Exact test. <sup>\*</sup> $p < 0.05$

## Summary of Quantitative Findings

The findings demonstrated that participants receiving the PPP had greater improvements in the composite outcome of maternal parental self-efficacy, social support and postnatal depression than the participants only receiving routine postnatal support both unadjusted and adjusted for demographic characteristics.

The intervention group had significant increase in maternal parental self-efficacy from baseline to posttest-1 and posttest-2 as compared to the control group. Likewise, there was significant increase in social support for the intervention group on both measurement points post intervention. Participants receiving the PPP showed an overall decrease in postnatal depression scores from baseline to both six and 12 weeks postpartum whereas the control group experienced an increase in postnatal depression scores at six weeks postpartum. The significant differences were found on all three-outcome variables between the intervention and control groups at six and 12 weeks postpartum when calculated independently. All the participants were satisfied with the intervention and the postnatal supportive care; however, significant differences were found between the satisfaction levels of the two groups.

## Findings from the Process Evaluation

### Sample Recruitment

Individual qualitative interviews were conducted in an effort to better understand participants' perception of the PPP. Originally, it was decided that the mixture of participants with the different maternal parental self-efficacy scores such as above median score of 42 and regarded as having high maternal parental self-efficacy, and those with maternal parental self-efficacy scores below 42 and regarded as having low maternal parental self-efficacy would be recruited for the interview. However, all the participants in the intervention group had high maternal parental self-efficacy scores (above 42). Therefore, regardless of MPSE scores all the participants from the intervention group were invited for the interview at six weeks postpartum until the data saturation was reached. A total of eighteen mothers participated in the interviews.

### Sample Characteristics

The mean age of the participants was 29.39 years (SD = 3.7, range = 23-39). All were married and majority of them were Chinese (44.4%), followed by Indian (27.8%), Malay (16.7%) and other ethnicities (11.1%). Two-thirds of the participants (61%) were university graduates and employed (66.7%). Three-fourths of the participants had monthly household incomes of S\$ 3000 and above (US\$2500 & above) (77.8%) and did not attend the antenatal classes (77.8%). More than half (55.6%) of the participants had caesarean section as the type of birth. The demographic data are presented in Tables 39 and 40 and were comparable to the participants in the intervention group. Table 40 also presents the details of the interviews duration.

Table 39. Demographics characteristics of the participants being interviewed (n=18)

Characteristics	n	%
<b>Age</b>		
<i>Range, mean (SD) 23-39, 29.39 (3.7)</i>		
<b>Ethnicity</b>		
Chinese	8	44.4
Malay	3	16.7
Indian	5	27.8
Others	2	11.1
<b>Marital Status</b>		
Married	18	100.0
Single/Others	---	---
<b>Educational Level</b>		
Primary/Secondary School	2	11.1
ITE/Polytechnic/Junior College	5	27.8
University Degree/ Higher Degree	11	61.1
<b>Employment Status</b>		
Working	12	66.7
Not-Working	6	33.3
<b>Monthly Household Income</b>		
<\$3000	4	22.2
\$3000 & Above	14	77.8
<b>Antenatal Class Attendance</b>		
Yes	4	22.2
No	14	77.8
<b>Type of Birth</b>		
Normal Vaginal Delivery/Assisted Delivery	8	44.4
Caesarean Section	10	55.6



Table 40. Description of participants and interview for the process evaluation

Participant	Age	Ethnicity	Marital Status	Highest Education level	Employment	Monthly Household Income	Antenatal Class Attendance	Type of Birth NVD*/Assisted/LSCS**	Duration of Interview
1	32	Chinese	Married	Degree	No	>S\$5000	No	LSCS	11 mins 23 sec
2	39	Chinese	Married	Degree	No	S\$3000-S\$5000	No	NVD	19 mins 49 sec
3	29	Chinese	Married	Degree	Yes	S\$3000-S\$5000	No	NVD	22 mins 15 sec
4	30	Indian	Married	Degree	No	S\$3000-S\$5000	Yes	NVD	09 mins 49 sec
5	29	Filipino	Married	Degree	Yes	S\$3000-S\$5000	No	NVD	18 mins 14 sec
6	32	Indian	Married	Degree	No	S\$3000-S\$5000	Yes	LSCS	21 mins 30 sec
7	33	Malay	Married	Secondary Level	No	S\$1000-S\$3000	No	NVD	11 mins 06 sec
8	27	Chinese	Married	Degree	Yes	>S\$5000	No	LSCS	22 mins 32 sec
9	26	Malay	Married	Secondary Level	Yes	S\$1000-S\$3000	No	LSCS	31 mins 44 sec
10	32	Indian	Married	Degree	No	S\$3000-S\$5000	Yes	LSCS	14 mins 59 sec
11	31	Chinese	Married	Degree	Yes	S\$3000-S\$5000	Yes	LSCS	13 mins 26 sec
12	27	Indian	Married	Diploma	Yes	S\$1000-S\$3000	No	LSCS	17 mins 30 sec
13	29	Chinese	Married	Degree	Yes	>S\$5000	No	NVD	14 mins 26 sec
14	31	Malay	Married	Diploma	Yes	S\$3000-S\$5000	No	NVD	10 mins 12 sec
15	28	Filipino	Married	Degree	Yes	S\$3000-S\$5000	No	LSCS	12 mins 52 sec
16	24	Chinese	Married	Diploma	Yes	S\$3000-S\$5000	No	LSCS	13 mins 31 sec
17	27	Indian	Married	Diploma	Yes	S\$3000-S\$5000	No	NVD	11 mins 31 sec
18	23	Chinese	Married	Diploma	No	S\$1000-S\$3000	No	LSCS	12 mins 58 sec

\* NVD = Normal Vaginal Delivery, \*\* LSCS = Lower Segment Caesarean Section

## Results of Thematic Analysis

Four major themes emerged from the thematic analysis of the interviews: (1) Challenges of postnatal period, (2) Benefits of participating in postnatal psychoeducation programme (PPP), (3) Strengths of PPP, and (4) Future directions. All themes and sub-themes are summarized in Table 41. Verbatim quotations from the interviews are included in the finding's reporting, in order to establish credibility of the themes by providing readers with a means of auditing (Holloway & Wheeler, 2002). The participant's interview number, followed by the line number(s) in the corresponding transcripts, represents references to the participants' quotes. For instance, a quotation from line numbers 96 to 98 of the interview transcript of participant 8 is indicated as '8.96-98'. To represent the unique Singapore context, the quotations are presented in its naturalistic form.

Table 41. Themes and sub-themes of the findings

Themes	Sub-themes
Challenges of postnatal period	<ul style="list-style-type: none"> <li>• Negative emotions</li> <li>• Difficulties in breastfeeding</li> <li>• Lack of knowledge in newborn care</li> <li>• Support Issues</li> <li>• Differences on confinement practices</li> </ul>
Benefits of participating in PPP*	<ul style="list-style-type: none"> <li>• Enhanced knowledge on newborn care, self-care &amp; breastfeeding</li> <li>• More confidence level</li> <li>• Improved help seeking behaviour</li> <li>• Better mood and less stressed</li> </ul>
Strengths of PPP*	<ul style="list-style-type: none"> <li>• Convenient &amp; helpful</li> <li>• Establish trusting relationship with the midwife</li> <li>• Comprehensive educational booklet</li> <li>• Cost saving</li> <li>• Fair and no discrimination service</li> </ul>
Future Directions	<ul style="list-style-type: none"> <li>• PPP as routine care</li> <li>• More home-visits</li> <li>• More phone follow-ups</li> <li>• More information in educational booklet</li> <li>• Web-based learning</li> </ul>

Note: \*PPP= Postnatal Psychoeducation programme

## Theme 1: Challenges of Postnatal Period

The participants highlighted a variety of challenges they faced in the early postnatal period. These were generally associated with negative emotions, difficulties in breastfeeding, and lack of knowledge in newborn care, support issues and differences on confinement practices.

Sub-theme 1 Negative emotions. Most of the participants' experienced negative emotions especially the feeling of being lost, fear and stress in the early postnatal period. Being first-time mothers and lack of prior experience of looking after their newborns added further to their distress. As the following quote illustrates,

*Because I am a first time mother so..I have no idea ..ah.. having a baby is actually stressful life... so there is a lot of things that I do not know. (7.27-29)*

*First came home..ah..I was actually..came back from hospital initially was very a bit ah..like shocked don't know do not know how to how to handle because this one my first time then a little bit scary..(3.23-25)*

The new mothers highlighted their un-preparedness in newborn care tasks and feeling of being lost as they were not aware where to seek help and who to ask regarding their newborn care related queries after the hospital discharge. As these mothers elaborated,

*I know that for new mothers like me .... initially we thought we are prepared.. but actually we when the baby delivered already we are lost..because so much things to stress out.. we have.. we are very tired... and.. ah.. then baby also don't know how to handle..all come into one..ya.. it is very stressful for the mother..especially for the first few week after come back from hospital..one ah...part.ah.. It's very ..it's very...stressful. (3.309-317)*

*Because that time I didn't know where can I ask..I didn't know..ah..where can I get the answers..because I want to be a good mom for him..ya..(1. 70-71)*

Sub-theme 2 Difficulties in breastfeeding. Many mothers were facing challenges in breastfeeding from not having sufficient milk to ignorance about the different positions in breastfeeding. Breastfeeding was regarded as a demanding task and presented several challenges to the mother during the postnatal period. Some mothers felt forced to breastfeed due to the pressure from the society and highlighted the lack of support available for the breastfeeding, specifically after the hospital discharge.

*Like people may be judge me that Oh! She doesn't want to breastfeed...so I felt pressured..(2.180)*

*I was not comfortable in feeding the baby..in all the in all the positions and I was not sure if I can lye down or I can turn like this and give ah... if the baby will be comfortable or I will be comfortable.(6.44-47)*

*So who who can correct me in breastfeeding after hospital discharge you see.. my mom who doesn't breastfeed last time she doesn't know... (11.162-163)*

Several mothers were stressed as they faced problems associated with breastfeeding, more commonly, the engorgement and lack of adequate milk supply. As described by the this mother,

*Ahh..the very the very shocking incident is at the day four when I just came back from the hospital right..then the next day my baby cannot right..don't know how to suck..how how to latch on and then I was very stressed because my my breast is keep engorging and he don't want to suck then I am very stressed.. (3.185-189)*

Sub-theme 3 Lack of knowledge in newborn care. Most of the mothers highlighted that being first-time mothers, they lacked the knowledge on various newborn care tasks such as handling the crying baby, baby's sleeping patterns, feeding schedule to holding the baby. They highlighted that they were not well informed and prepared about these tasks that caused them stress.

*Because I am the first time mummy.. I am low confident.. I do not know how to change the diapers..I even don't know how to hug the baby..(mother and midwife laughed.. the most worry things....when baby is crying.. I feel so ah.. bad.. Oh! The baby is crying and I feel very ah.. very sad .. but I don't know how to handle it..and I get stressed.. my mood is very low. (8.87-92)*

*..because I am a ah.. I am a first-time mom so I don't have any knowledge of taking care of your own baby..I have knowledge those of course school days because I am nurse but of course it is different .. if your it is your own baby..so that time I really don't know... I really don't know what to do I really don't know where to start..nobody tell me in the hospital.. I really don't know anything..(15.120-124)*

Sub-theme 4 Support issues. The findings revealed varied points of view on the support available for the mothers after the hospital discharge. Some perceived plenty of available support available while the others did not. Specifically, foreign mothers felt the limited social support available for them due to a lack of family support. The sources of support available for the local mothers were mainly from their own mothers, husbands and the mothers-in law. However several mothers highlighted the confusion and stress they had to face due to the conflicting advice received. Specifically, the support they receive from their husbands was either limited due to their work commitments or insensitive.

*When I delivered unfortunately my parents or ahmm.. even my husband's parents we both I mean they both couldn't come to Singapore to assist us...so we both were there alone to take care of the baby.(6.10-12)*

*I remember in the first ah.. one or two week I cried twice.. I feel stress from and also bothered from.. because hmm..my husband is saying this this.. my mother-in law saying that that and my mom like no! shall be here here here something like this so I am quite quite ah.. puzzled and feel very stressed ..(8.138-141)*

*There was this period where I feel down because my husband say..Aiya my mother got three children nothing ah.. you one person also cannot take care..(9.161-162)*

Very few mothers had a source of support available from the confinement nannies, however, those who had, were not fully confident about the support they received from them. For example, as highlighted by these mothers,

*Because nanny (confinement nanny) sometimes they are most at the older age already and then they don't know what is the trend now and then actually ah..and some things they say may not right also as they are non-professionals and sometimes their advise is conflicting with my own mother...(3.56-57,66)*

Mothers preferred to receive support from healthcare professionals including nurses and midwives, however, receiving support from the doctors was less common.

*The doctor I just see them at once.. but ah..so I not..ah..not so comfortable to share or..and then the doctor only have a limit time ya..they just in rush rush so..I don't feel ..comfortable ..I rather ask a nurse or midwife..(2.202-205)*

Sub-theme 5 Differences in confinement practices. Overall, the mothers who were interviewed had to follow certain confinement practices as imposed by their families including not going out of the house and following a certain diet. However, differences were seen in following these practices as most of the mothers acknowledged their benefits but found it impractical to follow some. As discussed by these mothers,

*Ah.. actually ah.. even though..ah.. we are not allowed to go out.. but since for the doctor appointment we still have to attend.. so I am not in that "pantang" (superstitious) lah .. in the confinement.. but of course its not really convenient ah.. during the confinement...we need to go out ..ya..actually like me.. the first time mother..so I need more rest ..ya.. so lets say if we need to go for appointment within the confinement time..So it's like ah. tiring and stressful lah..huh.(7.123-129)*

*By right it was like that (cant go out of the house due to confinement) but for my case it wasn't like that because from the first week onwards we started to go out with the baby because we I had to take her to the polyclinic for the first check up and all..and*

*after that during the first month itself ah.. I had to take her for the passport all those kind of things ah..so.. for me sit down at home was not possible..(17.131-135)*

## Theme 2: Benefits of participating in Postnatal Psychoeducation Programme

Mothers reaped many benefits by participating in PPP. These benefits were categorised into four sub-themes including enhanced knowledge on newborn care, self-care and breastfeeding, enhanced confidence level, enhanced help-seeking behaviour and enhanced emotional well-being.

Sub-theme 1 Enhanced knowledge on newborn care, self-care and breastfeeding. Most of the mothers interviewed mentioned that their knowledge on various newborn care tasks such as breastfeeding and soothing the crying baby as well as their knowledge on self-care had improved tremendously after participating in the PPP,

*You (midwife) come and help to provide the home visit that was very very great experience...because ah...you you gave me about the two hours to to bring me like knowledge of how to do the baby sleeping then bathing then eating whatever and give me the booklet which can boost up my evidence ah.. confidence and the knowledge lah..in starting up a new life with a newborn baby (mother smiled) huh.. (3.26-31)*

*My milk supply wasn't wasn't that great you see.. then I was very worried ...actually the book the book that was passed to us.. given to us also stated that ah.. ... drink the fish soup or fenugreek ah.. actually help then ah.. so I also call Shefaly (midwife) to confirm then ah..ya.. she said ya it's ok.. even if you are sick you also can take the fenugreek...so ok.. so I go and buy the fenugreek.. ah... it really helps you know.. it really help.. so with that I ..even more sure that this programme actually taught me the right things..ah and and ah.. I actually it really helps me in in settling this problem..this big worry of mine .. then I can sleep better...I am in better mood to take care my child and ah...better relationship with my family..ya. (11.74-85)*

Sub-theme 2 Enhanced confidence level. Mothers verbalised that their confidence levels were increased tremendously as they had someone to answer to their queries and receive timely feedbacks, which was within two weeks postpartum when the home visit was arranged. Mothers felt confident especially when they heard from the professionals (midwife) that they were doing well with baby care. The PPP had enabled their smooth transition to motherhood as they became more efficient and felt proud of being a mother. As explained by the following mother,

*It really very ah....makes me more confident because people ah.. some professional come to my house and then like oh.. I am doing good other than that you think.. tell yourself correct ah.. like this can or not.... so it's like when you (midwife) came and I tell you about milk.. and you said oh ya its ok to combine all.. so I don't feel I am a failure you know..ya.I feel confident..(9.209-213)*

Several mothers reported that the PPP was effective in that it not only improve their knowledge and confidence but also enabled them to share their knowledge with their loved ones and hence provided quality care to their babies. As one of the mothers elaborated,

*...At first.. I.. can say I am a...it actually improve my confidence in a way quite obviously because I can even actually teach my mom and my husband how to giving the ah...how to give the care to my baby..(11.68-70)*

Sub-theme 3 Improved help-seeking behaviour. Most of the mothers verbalised that the programme had enabled them to understand the importance of engaging in an open communication and being able to seek help from others. Several mothers mentioned that even though they had a quiet disposition and were initially apprehensive in sharing their feelings with others, but, after having gone through this programme, they had learned to be more open and more willing to clarify their doubts. This in turn, had facilitated their early adaptation to motherhood. As elaborated by the following mothers,

*Ya.. because also from the book and also you say that its ah.. it's helpful if I started opening up to other people just so that I can cope with postnatal stress...or*



*something.. I...started to ask my mom...ah.. about...if she really experiencing also this kind of feeling...when she had me and had my other siblings and also I ask my friends ah..ya... ah.. that...I experience this...experience that.. and then they give me encouragement and ya... support. (5.68-73)*

*After participating in this programme.. I feel it's ah..good to ask around for help..like..ah.. for example for those of my friends being a motherhood so ah.. share more things..ah.. not like before.. I thought that ah..It's ah.. shy to ask around like aiya.. you are a mother then you don't know what to do..know.. I feel that it's better for me to communicate with my those friends..or maybe I see people outside with babies also I just approach them.. not like not like "ba bodo" (malay dialect word for carefree)..ya. (7.77-83)*

Several mothers highlighted that the programme had benefitted them as a family. They mentioned that even when their family members were in doubt, they would encourage mothers to ask questions from the midwife, as one mother explained,

*In fact initially if there was any doubt my husband had he would come and note down in a notebook and he will come go ask shefaly (midwife) during the next phone call...so even more than me my husband is happy..we benefitted as a family..(mother laughed)..(6.324-326)*

Sub-theme 4 Better mood and less stressed. Most of the mothers mentioned that their mood was enhanced as their queries regarding newborn care were answered. They were more accustomed to the realities of newborn care as their myths about baby care had been corrected. Predominantly, they felt less stressed knowing that they were providing best care to their babies and they had professional help available to support their needs. This then led them to provide the best care possible to their babies. Several mothers verbalised that the added knowledge about postnatal depression and blues made them more vigilant about their emotional wellbeing, resulting which, they felt much better.

*It really prepare me that ah..it really prepared me that I will experience this kind of feeling like I will be experiencing postnatal blues... I now I know that it is very*

*normal to undergo those kind of feelings during ah... after giving birth...so I felt much better (5.81-82, 84-85)*

*After when you (midwife) come over like provide care and then to as in I know there is a support over there, there is someone to turn to when I moody or what .... ya! Ya the most important is the support at least you know someone who knows about all this is there to help you when you need the help (make you feel better emotionally)...(16.78-80, 83-84)*

### Theme 3: Strengths of Postnatal Psychoeducation Programme

Mothers verbalised many strengths of the PPP including it being convenient and helpful that enabled them to have a trusting relationship with their midwife, it had a comprehensive educational booklet and overall, there were cost savings and fair with no discrimination.

Sub-theme 1 Convenient and helpful. Majority of the mothers verbalised that one of the biggest strengths of the programme was that, it was convenient and the assistance was provided to them, which they needed. Mothers were not required to go out of their home environments as they were receiving care at their home. This was especially helpful for the mothers who found it difficult to go out of the house within the first one month postpartum due to the restrictions imposed due to the confinement practices. These mothers specifically found the home visits helpful as they received the necessary education at their own convenience. Largely, the home visits saved new mothers the trouble of looking for answers to their queries online or seeking help from other healthcare professionals.

*One thing is that it is very convenient you know I don't have to go down and actually set appointment and you know while you are feeding the baby and you felt ok I am late for the appointment.. so the home visit is really very convenient and plus like I can stop half way and attend to my baby... and then and what's that call the follow up calls it's also very useful helpful (14.129-133)*

*It's very convenient for new moms.. because they can't go out due to confinement..ah.. with the babies right.. they have to be at home...it's very convenient for a midwife to come to your home and give you advises and help on the spot .. rather than you go out and asking for help..or going somewhere else with your baby.. it will be very difficult to bring a newborn baby outside.... if you are at home you feel comfortable at home and you can also ask them more questions and if you are outside you might hurry to come back home or what.. so it's like very difficult...so it's very convenient ..(12.172-179)*

Several mothers highlighted that having a midwife visiting their homes was very helpful as she would be able to have a clearer picture of the conditions of both the mother and her newborn. The visit would also allow them to understand their home environment better.

*It's very beneficial since ah ah the...you (midwife) can see my baby if he is really doing and you can like like you check right ah...if I am really doing well.. because.. sometimes it's different from the if we go outside...then I will be dressed up and you won't see what I really.. what may be I hide what I really feel.. but if you come to the home.. you will see the actual the reality of (mother laughed)what it really look like..(5.121-125)*

*I think the programme is conducted in the home environment is much better than those demonstrating in the hospital.. because at home ah... the nurses can interact the baby and they can know the baby specific characteristics.. and then they can give more useful comments or suggestions towards this specific baby.. but if ah.. if you just bring the baby to the hospital sometimes...ah.. baby at home...she is very naughty and we cannot solve it.. but when we are bring her to hospital to see the doctor she is settle down already and doctor... everything is fine no problem (8.179-186)*

Sub-theme 2 Establish trusting relationship with the midwife. Many mothers felt that due to the home visit component of the PPP, they were able to have a face-to-face interaction with the midwife that allowed them to establish a trusting relationship with the midwife. Several mothers also found that the friendly and helpful disposition of the midwife who conducted the programme enabled them to

have a trusting relationship with her. Due to their trust in the midwife, mothers were able to open-up and ask questions from the midwife.

*It was also comfortable with the person with you...so that I can ask more questions to you.. I started to ask questions how to taking care of the baby because I really understood what you were trying to do..trying to tell me.. you really came down to my house and show me how to take care of him...ya.. because you are very ah friendly and ah.. like easy approachable..(I was able to ask more questions)... not some like maybe you are doing this programme but you don't really have to be like this may be like very committed to the programme .. you really want to help the mothers so we also feel comfortable talking to you and asking advises to you.. you don't feel irritated (10.68-72, 82-85)*

*I am actually very grateful and I actually need to thank you (midwife) as well because it might be that this programme is useful but let's say it has been another person who come over which I don't feel that is so caring or so helpful right..then ah..I might not feel ah. Felt this way about the programme..because I feel that the ah..ah.. the human touch is actually very important which you actually have displayed..ah..very ah.. good role model because I you ah you have actually shared your experience with me , you are a mother so I feel that since..you have you have gone through as well so I was thinking like why can't I do it as well..so I look upto as a role model and ah.. because I see you are doing such a ah..useful ah..thing..as in..you are doing a very good deed... you are no related to me and then you know you all can go to such an extent so I feel very grateful...(18.418-427, 433-434)*

Sub-theme 3 Comprehensive educational booklet. All the mothers who were interviewed verbalised that the booklet was easy to comprehend. The other strengths of the booklet were, its simple layout explained in point form and being filled with colourful pictures. They also valued having the content page, reading list and more importantly, the important contacts provided to them in the booklet in case of an emergency. Several mothers verbalised that they liked the contents of the booklet as it had covered information considering local multiracial society. The majority of the mothers also liked the size of the booklet as they felt it was easy to

handle and that they could manage to read it even when they were breastfeeding. As explained by several mothers,

*Ya... because I work in Popular right (bookshop) and also when there is a pregnancy book ha...after that my friends all ask me to read...so but this book is more simple and easy for me to remember where I read quite a few book ah.. too many ha.. I don't know which one is correct to follow...because some like in the US (Unites States) is different and UK (United Kingdome) different so it's better to have something local lah..ya.. so this book is quite good lah.....because they tell you different different things.. ...what I mean is that some of these authors also they are not mothers so they don't know what you actually going through ha..so it is better to find something local and is made for mothers lah....easier for you. (9.179-182, 188-191)*

*It's very well how do I say.. well well layed off..ah... there is content page and if ah.. I will just point to the questions that I have in mind and refer to that page.. It's its very simple.. very very hu..I think it doesn't really ah.. I do not need to spend a lot of time to read read all you see .. so only..whenever I have questions or I forget and all just refer to that section ya..an there are some highlights also ..those highlight are those I read actually ..I go through lah and read those highlights, which I think, may be will be useful.(11.145-151)*

Primarily, the educational booklet was the main source of information for the new mothers, especially after the home visit. Majority of the mothers found that they received holistic information divided into various chapters from the booklet. Several mothers mentioned some of their favorite chapters such as newborn care, self-care and insights for new parents in the booklet.

*It improved the knowledge because the book has everything...the book has all the information about taking care of the baby...even about giving milk, breastfeeding , about ah.. why the babies cry, what are the possibilities of baby crying, what we should do, everything is inside the book...ah.. we can just actually read it as a storybook to have more knowledge about the baby , any doubt also we can take out*

*the book anytime.. because it's with you every time ... if you really need the answer to the question the book answers everything.(12.135-140,142)*

Sub-theme 4 Cost saving. Several mothers verbalised that one of the vital strengths of PPP was that, there were no costs incurred from participating in this programme. As the midwife answered many of the mothers' queries, cost savings were realised by not having to go to the doctors. They also felt that having a midwife visiting them at their homes saved them from their cost in travelling by bring their baby out of the comfort of their homes. As elaborated by these mothers,

*It really helps so compare to going out right..going to the clinic and everything so much more beneficial this programme like ah.. this programme is very beneficial for us.. because it can like what's this ah.. ya..the home visit can avoid you going out like ah.. visiting doctor seeing the doctor or what so this one...ya..then all the rashes I ask you for medicine like that like that I think that one more like like convenient like if you ask the doctor you need to pay, you need to go the doctor compared like asking you then its its more convenient..(15.149-152, 154-155,212-214)*

*The most important is the cost (mother and midwife laughed) I don't need to pay for the transportation as in to see the doctor if I have any questions.. if not I got to see the baby doctor ya.(16.118-120)*

Sub-theme 5 Fair and no discrimination service. Majority of the mothers verbalised that they felt lucky to participate in this programme as there was a fair way of choosing them by drawing on number slips. Foreign (non Singaporeans) mothers such as Filipinos and Indians especially felt not being discriminated as they were given an equal chance to participate. As elaborated by these mothers,

*I am glad that this programme not only for Singaporeans ya.. because some programme ah. I saw some study they only include Singaporean. (2.306-307)*

*Its really really good ha to participate.. because not everybody get the chance to participate in this programme then I also heard from my friends that they go back KK*

*(KK women and Children's hospital) don't have such programme..so actually feel like..wah.. I so lucky ha. (mother laughed) ya..(9.139-142)*

*By the way the way you select the participants is also something very new to me right.. in the hospital actually it's like wah I feel so lucky you know..(mother laughed)..because I wasn't very ah..when I participate in any lucky draw usually I wasn't the one to be pick up (mother and midwife laughed)..so at that time wow! something new it's a new start it's a good start for me..it's very fair..(11.242-248)*

#### Theme 4: Future Directions

Most of the mothers were very happy with the original design of the PPP and advocated it to be a routine programme. As such, they preferred the home visit followed by the phone calls and the educational booklet provided. However, some mothers suggested having more such home visits and phone follow-up. Some mothers also suggested having more information to be included in the educational booklet. Few mothers recommended incorporating web-based learning for future programmes.

Sub-theme 1 PPP as routine care. Most of the mothers were very satisfied with the PPP. They verbalised their agreement with having all the three components, that is, home visits, phone follow-up and the educational booklet in the programme as they felt each component had its respective benefits. As such, elaborated by one mother,

*I feel you know it should have the home visit, the booklet and the the phone calls because the home visit you know.. home visit actually it's a professional help.. so any mother knowas I said from 20% of confidence level know immediately from that one day my confidence level increase to 80% because you believe to tend to trust the person who has knowledge on this.. who is a professional..and then booklet you know.. every time you don't want to call or you don't want to find the information in the net and because it is also tedious when you are already handling the baby..ah.. just open the book, read it and it's done.. and phone calls especially because as and*

*how you are travelling through the journey you get a lots of doubts..so you know the real time doubts..for that the phone calls is really helpful.(1.222-231)*

The majority of the mothers were specifically pleased with the timing chosen for the home visits, which was within two weeks postpartum. Mothers felt that the early postpartum period was a stressful transition period for them to adapt to motherhood and hence the external support was much needed and welcomed by the mothers. As explained by one mother,

*I think the most critical period is the first one to two weeks .. one week is because mummy.. mummy herself is recovering.. another reason is we are in the first..ah.. first period to to interact with baby.. because in the hospital...we have.. we can get the help from nurses have changing diapers and bathing and we think nurses can help.. we can just ring (bell).. but when we are back home we need to know everything by ourselves ...but.. with the home visit nurse .. then ah..they are at least experienced.. they can know at least the baby's response and they can how to handle handle the problem... within first two weeks the visit was very helpful. (7.60-69,73)*

Several mothers verbalised that as the programme was very beneficial for them, the programme should reach out to many more mothers by making it to be a part of routine care. They felt that it could help those mothers who most needed the support such as the foreigners, locals living alone without their families in Singapore, first-time mothers, mothers having low monthly-household incomes and those mothers who could be depressed. As discussed by these mothers,

*Not people are not mothers are fortunate like me to understand maybe some mothers are really undergo the very serious depression so..ah..this this really should continue..especially to those mothers who are more prone to depression serious type of depression .(5.199-201)*

*Especially the first mothers like me .. first time mothers.. and those maybe who are living without any parents staying with them.. ah..probably ah.. those ah..couples who really don't like to mix with the rest.. at least help for them you know.. that build the*



*confidence like me ah.. to at least to release their stress...instead of like you know no help .. nobody cares. (8. 143-147)*

*Especially for those lower income family right, ok....whereby ..we actually will for ah... because you know you know that for new mothers especially ok...we don't have..you know extra income to hire confinement nannies or ah ...people to take care of hmm..you know mother and baby which i don't have ah... so this programme will definitely be able to help them like go through the stage that I have gone through..(16. 396-397, 401-402, 409-410 )*

Sub-theme 2 More home visits. Very few mothers suggested having more than one home visit in the postpartum period rationalizing that as the baby grows they would face newer challenges. However, most of those who suggested also understood the practical limitations of having more home visits as shared by these mothers,

*I think will be one visit in the first two weeks which you already have ...and one more visit during one to two month... ya.. because first ah.. first week is very stressful because we are new to the baby..and ah.. the second time is because at that time the baby is changing a lot..she has different behaviours almost everyday..everyday..has different things.. (8.240, 242, 245-247)*

*Ya we can't always expect ah.. means once or twice the person might.. you might come home.. I can't expect you to be here 24 hours or every day.. like you also have other moms to take care ( mother smiled) ya so the book and phone-follow-ups really helps a lot..(12.145-147)*

Sub-theme 3 More phone follow-ups. Some mothers felt that the phone follow-up should not only be confined to the first month postpartum, but should also be extended to beyond the first month, which was, as a matter of fact, the original criterion. The mothers felt that they might need more help as the baby grows and especially during specific milestones such as during the introduction of solid food. They also understood the challenges that a midwife had in trying to call the mothers and the mothers then suggested that they could be provided with the option of initiating the phone call. Most of the mothers were not consistent in their suggestions

of having more phone follow-up beyond the first month postpartum. The suggestions for phone follow-up with the mothers, varied from as early as three months to up to two years postpartum. As elaborated by these mothers,

*Improvement ok you can increase it (phone calls) into one year..one year when the baby is one year (both mother and midwife laughed) I know its may be not possible for you guys but we will be very happy if you increase it the the ya the so called duration phone follow ups to one year.. ya very happy (mother laughed)... ok from your side I think if I see from your side not doing I mean it is not easy to do every week and all so maybe once in a month or something but if it allowing us to call you guys then it will be very helpful anytime it is there...(17.167-170,179-181)*

*I hope that maybe the phone calls ahh..follow up can be extended lah... because this is so we this is as to maybe we can keep in a long time contact and then because baby has different stages like ahh ....so if let say maybe for two years (phone follow ups) ok (mother laughed)..but of course not very frequently like maybe ahmm..first 6 months, 8 months, a few months interval. (18. 322-323, 343-345)*

Sub-theme 4 More information in the educational booklet. Some mothers suggested that there should be more information in the educational booklet. Their suggestions varied from a general feedback on updates of information in the booklet to adding specific topics such as gastric issues with the baby including frequent regurgitation and practical tips on putting the baby to sleep. As explained by one mother,

*Can we add some information for mummies about how to do the sleep changes. ... and how can we get get baby fall into sleep very quickly...and also the contents of the booklet should have something..practical tips on sleeping behaviours or put the baby to sleep..(8.163-164, 168, 236-237)*

Sub-theme 5 Web-based learning. Some mothers suggested tabbing along the technology and introducing web-based learning to this programme. They recommended having an online chat, forum or a Facebook page created for them so that they could pose their queries at any time of the day. They felt that it would also

be less straining for the midwives as they would not have to repeat themselves too many times as the mothers would be able to learn from the previously answered queries. Mothers felt that web-based learning would be effective as it would not require them to leave the comfort of their homes. Through such web-based learning, the possibility of a longer-term support system would also prevail. As elaborated by these mothers,

*Online chat would have been ah.. will be very helpful .. you know every time you you are not comfortable calling ..you you are not sure if the other person is free to answer your calls.. so if a 24 hours you know online chat is there. So anytime you have a doubt ...you can get the answers immediately.6.275-280... because on the on-line chat you know the other person is sitting to answer your query.. but in phone call I am not sure if the other person is free or not...so 24/7 support would be good.... (6.275-280, 284-286)*

*Having a forum for the moms and then they can pose their questions and some questions may be it is very common and one mom has asked and midwife had already answered and you are posing the same question then rather than midwife repeating you can actually ah..that's a very good and practical way.. ...But the forums will be only applicable after the first three months or something..that's what I think because during the first three months I don't think we will be able to see the website and all that ..so first three months, continue with this programme...(17.192-196, 199-201)*

Despite these suggestions, all the participants expressed that they would recommend the PPP to the other mothers especially the first-time mothers as they had benefitted most from this programme.

## Summary of the Process Evaluation Findings

The findings revealed that the participants in the intervention group perceived the PPP to be most valuable and helpful in increasing their confidence level, fostering help-seeking behaviour, enhancing emotional well-being and increasing their knowledge in newborn-care, self-care and breastfeeding. However, participants faced many challenges in the early postpartum period especially prior to the home visits by a midwife such as negative emotions and difficulties in breastfeeding and support issues.

The findings also revealed that the participants found various strengths in the PPP. It was convenient and helpful; the availability of the comprehensive educational booklet further enabled them to have a trusting relationship with the healthcare provider, a midwife; and they also found the programme to be fair, with no discriminations and no cost to the participants.

Suggestions by the participants for improvements to the programme included, offering PPP as a form of routine care, having more home visits, more phone follow-up and greater information in the educational booklet as well as web-based learning for the new mothers.

## Summary

This chapter presents the results of the effects of a postnatal psychoeducation programme on maternal parental self-efficacy, social support and postnatal depression among first time multi-racial mothers in Singapore. A total of 122 primiparas were recruited with 61 in the intervention and control groups. Attrition rate was 11% with 108 participants having completed the protocol and 14 participants having violated the protocol. A comparison of the baseline characteristics for participants who completed the protocol and those who violated the protocol revealed no significant differences.

The findings demonstrated that the participants receiving the PPP and routine care had greater improvements in the composite outcomes of maternal parental self-

efficacy, social support and postnatal depression when compared with participants only receiving the routine care both without controlling and after controlling for confounding effects of demographics such as age, ethnicity and type of birth.

The intervention group had shown an overall improvement in maternal parental self-efficacy and social support and reduction in postnatal depression from baseline to posttest-1 and posttest-2 as compared to the control group. The findings showed significant group differences on all three-outcome variables at six and 12 weeks postpartum when calculated independently. Overall, the participants were satisfied with the postnatal support.

The qualitative interviews revealed that the participants faced many challenges such as, negative emotions, and difficulties in breastfeeding and support issues in the early postpartum period especially after the hospital discharge. However, all the participants in the intervention group perceived the PPP to be helpful in increasing their confidence in newborn care, fostering help-seeking behaviour, improving emotional well-being and increasing their knowledge in newborn and self-care as well as in breastfeeding. Suggestions for programme improvements included more home visits, more phone follow-up and greater information to be included in the educational booklet as well as recommending PPP to be offered as a routine care. Overall, there was a high satisfaction and acceptability with the PPP.

## CHAPTER 6 DISCUSSION

### Introduction

The aim of the Phase II study was to investigate the effectiveness of a Postnatal Psychoeducation Programme (PPP) in promoting maternal parental self-efficacy, social support as well as reducing postnatal depression in first-time mothers. The study findings will be discussed with reference from literature. This chapter will start with the baseline characteristics of the participants including demographic and outcome variables, the relationships among outcome variables across time and their differences between demographic sub-groups. The effects of the PPP on maternal parental self-efficacy, social support and postnatal depression will be discussed next. The process evaluation highlighting challenges of new mothers and the factors influencing the effectiveness of conducting the PPP will be discussed. The process evaluation will be followed by the strengths and limitations of the study. Implications for clinical practice regarding the development and implementation of PPP will be presented. Recommendations for future research will be provided to advance the quality of care for first-time mothers. This chapter will conclude with a summary of the study.

### **Participant's Demographic Characteristics**

The Phase II study recruited a total of 122 first-time mothers and they had a mean age of 28.6 years, which is 1.2 years younger than the mean age of first-time mothers (Mean= 29.8) at the birth of their first child in Singapore in 2011 (Singapore Department of Statistics, 2012). The biggest proportion of the participants was Chinese (32%), followed by Indians (27%), Malays (20.5%) and the other races (20.5%). In Singapore, among the general population, the dominant ethnicity continues to be the Chinese though the difference between the Chinese and the other ethnicities is significantly large (Chinese 76.8%, Malay 13.9%, Indian 7.9%, other 1.4%) (Singapore Department of Statistics, 2012). This study had a fair representation of all races.

All the participants completed at least primary school education and 80% of them had secondary or higher education, which is comparatively higher than the education level of the general population in this age group in Singapore (around 63.7% completed secondary or higher education) (Singapore Department of Statistics, 2012). More than two-thirds of the participants (69.7%) were employed, which was higher than the employment rate in the female population aged 15 and over in 2011 (57.7%) (Singapore Department of Statistics, 2012). The higher employment rate could be related to the higher education level of the participants. The mean household income was S\$3000 (US\$2500) among 69% of the participants, which was similar to the mean household income in the general population in 2011 (S\$ 3,500 = US\$ 3000) (Singapore Department of Statistics, 2012).

The majority of the participants were well-educated, middle income earning working mothers. Similar characteristics have been reported in participants of other local studies which found that participating mothers were generally older, had a higher level of education and family income (Chee et al., 2005; Ong et al., 2013). Other international studies providing antenatal educational programmes (Cliff & Deery, 1997; Gao et al., 2010; Lumley & Brown, 1993; Ngai et al., 2009) have also found that attendees of childbirth educational programmes had a higher education level and family income as opposed to those who did not attend these classes. These studies (Cliff & Deery, 1997; Lumley & Brown, 1997) have shown that class attendance in the educational programme was associated with women's attitude towards these programmes. It could be possible that educated working mothers as in this study, perceived a greater need for an educational programme and hence were more motivated to learn about newborn care and parenting. Especially when the participants in this study were English speaking, they could generally be more educated and employed as compared to non-English speaking mothers in Singapore. Previous studies suggested that younger women with low incomes and educational levels are particularly vulnerable to the development of perinatal depression (Beck, 2002; Lee & Yen, 2007). Thus, efforts should be made to reach out to this group of mothers to explore the reasons why they were reluctant to participate in the study and assess their needs in order to facilitate a smooth transition to motherhood.

## Baseline levels of Maternal Parental Self-efficacy, Social Support and Postnatal Depression

### Maternal Parental Self-efficacy (MPSE)

The participants had a mean score of 31.6 (SD = 7.0) on the PMPS-E scale on the day of discharge (one-three days postpartum) which is lower than the PMPS-E mean reported in previous studies on Caucasian primiparas (M = 59-66) (Leahy-Warren et al., 2011a; Barnes & Adamson-Macedo, 2007). This could be due to the differences in time of data collection among these studies such as 6 weeks postpartum (Leahy-Warren et al., 2011a), within first 28 days postpartum (Barnes and Adamson-Macedo, 2007) or day of discharge (1-3 days postpartum) in this study. Being primiparas, the participants did not have prior experience in looking after newborns, which could have led to a lower maternal parental self-efficacy. In addition, the early postnatal discharge from the hospital could have added to the stress of first-time mothers because of inadequate opportunities on learning and practicing the various newborn care skills (Forster et al., 2008; Kapp, 1998; Tarkka, et al., 2000). This could be the reason that participants in this study had a lower maternal parental self-efficacy score when compared with other studies. Previous literature (Leahy-Warren & McCarthy, 2010; Reece & Harkless, 1998) showed that maternal parental self-efficacy evolved with time in the postnatal period. That could explain the higher maternal parental self-efficacy scores in other studies (Barnes & Adamson-Macedo, 2007; Leahy-Warren et al., 2011a) as compared to this study.

According to Bandura (1997), the level of self-efficacy determines the effort one puts in achieving tasks. Being low in self-efficacy, mothers could be deterred in facing the new challenges and learning various newborn care tasks (Coleman & Karraker, 1997; Zeiss et al., 1999). This could lead to a vicious cycle of a decrease in maternal parental self-efficacy and thus add to the stress in maternal adaptation to early motherhood. The process evaluation in this study supported that mothers lacked confidence in various newborn care tasks in the early postpartum period after the hospital discharge.



## Social Support

The participants had a total mean score of 56.8 (SD = 6.7) with range from 39-74 on the PICSS scale (both functional and structural). This suggested that the participants perceived satisfactory levels of overall social support (Leahy-Warren et al., 2011a). The satisfactory level of social support enjoyed by the primiparas could be due to the strong sense of interdependence among family members in the Asian society where pregnancy and childbirth is considered as a vulnerable period and support to new mothers is deemed necessary (Naser et al., 2012). It is also possible that the majority of mothers in this study were working mothers with a high monthly household income which might have helped increase their network of social support especially by hiring a domestic helper which is a common practice in Singapore.

The process evaluation in the present study also supported that mothers had ample social support though they sometimes suffered from conflicting advice from various sources. This is similar to findings from previous studies (Martell, 2001; Ngai et al., 2011) where conflicting advice from various sources such as mothers, husbands, friends and mothers-in law were the reasons for the added stress for new mothers. Hence, Whitaker and Cowly (2012) warned that the mere availability of a support system does not guarantee benefits for the mothers unless individual mothers are satisfied as well.

In addition, in this study, some husbands chose to stay overnight with their wives in the hospital to provide support and this could be the reason mothers perceive satisfactory social support. The majority of the participants reported informal social support especially from husbands and maternal parents as their main sources of support (M = 6.0, SD = 1.9). Very few participants indicated receiving formal support (health professionals) (M = 0.56, SD = 0.8) in caring for their infants on day of discharge from the hospital. The results of this present study were similar to a study conducted among Irish mothers (Leahy-Warren et al., 2011a) in which the mothers also rated higher in their informal support. The reason of less formal support from health care professionals could be due to the early hospital discharge leaving less time and opportunities for healthcare professionals to provide the required support to the mothers while they were in the hospital (Kapp, 1998). Husbands were the main

sources of emotional and appraisal support in the present study for the mothers which was consistent with the findings from previous studies (Leahy-Warren 2005, Tarkka et al., 2000).

For the functional social support subscale, the mean score was 50.3 (6.2), which was lower than the support reported by Caucasian mothers ( $M = 68.3$ ,  $SD = 8.9$ ) (Leahy-Warren et al., 2011a). Within the functional support subscale, the ratings of informational and instrumental social supports were lower than the emotional and appraisal social supports. These findings are similar to a local study (Phang & Koh, 2010) where first-time mothers reported that their need for informational social support was not met. This could again be explained by the early hospital discharge leaving lack of time for the proper education for postnatal mothers (Fenwick et al., 2010; Kapp, 1998). In addition, the low attendance at antenatal educational classes due to the additional cost for the participants in Singapore (Phang, 2009), could further explain the lack of informational support among postnatal mothers.

### Postnatal Depression

In this study, the participants had an average score of 8.2 ( $SD = 4.1$ ) measured by EPDS at baseline, which was within the range indicative of an absence of depression. However, the baseline data was collected at day of discharge, which was first to third day post delivery. Hence, it could be too early to detect and diagnose postnatal depression during this period. The majority of new mothers coped well, though a substantial proportion (22%) of new mothers in this study were at risk of developing depression (scores 10 and above) at the time of discharge (Days 1-3 post delivery) with a prevalence rate of 13.9% using the recommended cut-off score of 13 and above (Murray & Cox, 1990). Similar scores have been reported in a Singapore study (6.8%) (Chee et al., 2005) and in international studies (13.2%) (Gao et al., 2008; Leahy-Warren et al., 2011a,b). The data was collected on day of discharge (within 1-3 days postpartum) in this study and 6-8 weeks to 12 weeks postpartum in other studies (Gao et al., 2008; Leahy-Warren et al., 2011a); hence caution is needed when making comparisons. However, the results of this study highlighted that many mothers had high depression scores as early as day of discharge (1-3 days) post delivery.

In the Singapore context, Chinese, Malay and Indian mothers are expected to rest in the first one month postpartum (Naser et al., 2012). This cultural practice in Asia is known as 'Doing the month' or 'confinement' where mothers receive the required attention from their family members, especially from the older members such as maternal mothers and mothers-in-law and had a long period of rest during the postnatal period (Holroyd et al., 1997; Holroyd et al., 2011; Hung, 2005). The 'doing the month' ritual and the interdependence within the family is believed to prevent future illness and to maintain mothers' physical and psychological health (Holroyd et al., 2011; Naser et al., 2012; Pillsbury, 1978) as the mothers or mothers-in-law are expected to provide advice and guidance concerning newborn care and maternal self-care.

The previous local study conducted on multi-racial Singaporean mothers (Chee et al., 2005) and international Asian studies on mothers residing in Mainland China (Wan et al., 2009), Hong Kong (Chan et al., 2002), Taiwan (Heh et al., 2004) and India (Rodrigues et al., 2003) found that new mothers cared by strict and dominating mothers-in-law during the confinement period and with un-supportive husbands were more distressed emotionally. In addition, those new mothers who perceived that confinement was un-helpful had twice the possibility of developing postnatal depression (Chee et al., 2005; Heh et al., 2004; Leung et al., 2005).

The process evaluation in the present study found that the confinement ritual of not leaving the house for a month after delivery was not followed by most mothers as it caused extra stress to them especially when they had to bring their babies for medical checks. The mothers felt better by being flexible about confinement practices. Thus, it is not surprising that there is an increasing trend of new mothers in contemporary Singapore who either do not follow the confinement practices or they practise it with some modifications which are less strict and more pragmatic (Ong et al., 2013). This further reflects the increasing independence of the younger generation due to rapid economic development and industrialization (Holroyd, et al., 2011). A descriptive study in Singapore found that new mothers used modern technologies, such as the internet and online discussion forums to consider the benefits of confinement practices before following them (Naser, et al., 2011), which is indicative of rising affluence within contemporary Asian settings. Thus, the discussion on confinement

practices could be beneficial in reducing postnatal depression as mothers share their concerns and follow what is practical and appropriate for their newborns and themselves. As such, it was highlighted in the process evaluation of PPP that mothers benefitted from the discussions on confinement practices during the home visits.

#### Difference of Outcome Variables Between/Among Demographic Sub-groups

In this study, age had a negative significant but weak correlation with the maternal parental self-efficacy but it had no correlation with social support and postnatal depression. Older mothers tend to have lower maternal parental self-efficacy as compared to younger mothers. The findings are in congruence with the findings of Ngai et al.'s (2010) study. This could be due to the reason that younger mothers tend to be more resourceful and are able to adapt better to motherhood in this study. The comparisons however, should be viewed with caution, as different instruments were used to measure maternal self-efficacy across studies.

There were no statistical significant differences of outcome variables between/among most demographic characteristics except ethnicity and marital status. Significant differences were found for maternal parental self-efficacy levels between different ethnic groups and Chinese mothers tend to have lower maternal parental self-efficacy as compared to mothers in other ethnic groups. This is an empirical finding unique to this study and could be due to the multi-racial ethnic society of Singapore. According to the ethnic distribution among the general population, Malays and Indians are minorities compared to the Chinese and hence further studies are needed to understand the effects of ethnicity in Singapore (Singapore Department of Statistics, 2012).

There were significant differences found for social support between mothers who were married or un-married; where married mothers tend to have more social support as compared to un-married mothers. This finding is congruent with previous findings (Barclay, Everett, Organ, Schmeid & Wyllie, 1997; Haggman-Laitila, 2003; Leahy-Warren, 2005) where husbands are considered as the main source of appraisal and instrumental support in the postpartum period. The findings of this study also showed that husbands were the main source of emotional and appraisal support for new

mothers and this might explain the differences in social support received between married and un-married mothers. These findings further highlighted the needs of involving significant others especially husbands and parents in educational programmes so that they could understand the type and importance of support they could provide to new mothers.

### Relationships among Outcome Variables

In this study, the maternal parental self-efficacy was positively correlated with social support and negatively correlated with depressive symptoms suggesting that mothers with greater social support had higher maternal parental self-efficacy in looking after their newborns and experience less depressive symptoms in the early postnatal period. These findings were consistent with Bandura's self-efficacy theory (Bandura, 1997) and social exchange theory (Blau, 1964; Homans, 1961). Social support entails networks that enable people to cope with stressful life events such as early motherhood that in turn enhance their self-efficacy. This study also found that the emotional state of mothers was associated with their self-efficacy beliefs.

As highlighted by Bandura (1997), there are four factors, which are crucial in enhancing self-efficacy. They are: mastery experience (one's prior experience of performing a specific task), vicarious experience (learning from others while observing them performing a task), and verbal persuasion (verbally assure someone that they are worthy and capable of performing a task) and the emotional and physical states of someone affecting their self-efficacy beliefs. Research evidence strongly support that the vicarious experience and verbal persuasion components are linked to social support and social support has a strong influence on self-efficacy (Ip et al., 2009; Leahy Warren et al., 2011a; Ngai et al., 2009; Tarkka et al., 1999). Hence, the mothers with better social support would have better perceived maternal parental self-efficacy and psychological well-being.

Such findings are congruent with previous findings that mothers who possess a high level of social support are high in maternal parental self-efficacy beliefs and are less susceptible to depression (Haslam et al., 2006; Leahy-Warren et al., 2011a,b). The quantitative correlation descriptive study (Leahy-Warren et al., 2011a) among 410

primiparas at six weeks post delivery reported statistically significant correlations among functional social support and informal structural social support, postnatal depression and maternal parental self-efficacy. There were also correlations among postnatal depression, informal social support and maternal parental self-efficacy.

Another study examined the relationship between functional and structural social support and postnatal depression among 512 Irish primiparas at 6 and 12 weeks postpartum also found significant relationships between social support and postnatal depression (Leahy-Warren et al., 2011b). In line with that, Haslam et al. (2006) found that higher parental social support and maternal self-efficacy among 192 primiparas at four weeks postpartum were associated with lower levels of postnatal depression. The path analysis showed that social support lowered postnatal depression by enhancing the maternal self-efficacy (Haslam et al., 2006). In other words, maternal self-efficacy has a mediation role between social support and postnatal depression.

The positive correlation between social support and maternal parental self-efficacy in this study suggested that social support in the form of informational, instrumental, emotional and appraisal support might have included not only information for first-time mothers but also feedback on their mothering skills; in this case, they could have learned from their mistakes and hence have had increased maternal parental self-efficacy. The negative relationship between maternal parental self-efficacy and postnatal depression implied that having higher maternal parental self-efficacy in looking after their newborns might have provided the emotional security to the mothers. They then persevered and faced the challenges courageously, thus experiencing better psychosocial well-being. These findings complemented the theoretical framework of the study that there are associations among self-efficacy, social support and postnatal depression. In addition, maternal parental self-efficacy and social support have been found to play a significant role in maternal psychological well-being.

The findings are consistent with Bandura's self-efficacy theory (1997), which explains that the resilience to adversity, stress and depression experienced in coping with various demands and the levels of accomplishment felt are all consequences of self-efficacy beliefs. The findings of this study supported that mothers who had high

maternal parental self-efficacy would be more persistent when facing difficulties or challenges in newborn care and are more likely to initiate productive courses of actions and hence adaptive coping (Bandura, 1997; Coleman & Karraker, 1997; Tarkka et al., 2000). However, unique to this study, out of the four factors highlighted by Bandura in enhancing maternal self-efficacy, the verbal persuasion provided by both formal and informal support systems have been reported to be crucial for enhancing maternal confidence during process evaluation. This is a new finding that needs to be tested and evaluated further in future research, especially when verbal feedbacks from formal and informal sources are considered very important and lacking for the Asian mothers (Chan et al., 2002; Chee et al., 2005).

The process evaluation of this study also supported that receiving individualised support from the midwife relieved maternal stress and hence they felt more confident in looking after their newborns and taking up the maternal role. These findings concur that providing individualised support is critical to enhance maternal parental self-efficacy and psychological well-being.

### Effects of Postnatal Psychoeducation Programme on Outcome Variables

#### Composite Outcomes

The previous literature and findings of this study indicate that maternal parental self-efficacy, social support and postnatal depression are inter-related components (Haslam et al., 2006; Leahy-Warren et al., 2011a,b). Bandura's self-efficacy theory (1997) postulated a relationship among self-efficacy, social support and psychological and physical well-being of an individual. Bandura (1997) proposed that individuals who exhibit high levels of self-efficacy would have good social support systems to enable them to receive verbal appraisal for the task they perform and to learn from their experience (vicarious learning). Bandura (1997) also highlighted that prior personal exposure of performing a particular task and physical and psychological well-being of an individual could enhance their self-efficacy. The findings of this study reveal that there was a positive correlation between maternal parental self-efficacy and social support and a negative correlation between maternal parental self-

efficacy and postnatal depression. These significant correlations among the outcome variables supported that their relationships were inter-twined and should be analysed jointly. Thus, it was conceptually and empirically appropriate to compare the combined effect of the outcome variables.

The findings, both unadjusted and adjusted for potential confounding factors of demographic characteristics such as age, ethnicity and employment status, revealed an overall difference between the intervention and control groups on the composite outcomes of maternal parental self-efficacy, social support and postnatal depression. The participants who received PPP experienced greater improvements in the combined outcomes of maternal parental self-efficacy, social support and postnatal depression when compared with mothers who only received routine postnatal supportive care. Congruent with previous research (Haslam et al., 2006; Leahy-Warren et al., 2011a,b), social support facilitated mothers in coping with stressful demands of motherhood in the early postpartum period; this in turn contributed to better psychological well-being and greater maternal parental self-efficacy in adaptation to motherhood. This study provides empirical support for the overall effectiveness of PPP in promoting the composite outcomes of maternal parental self-efficacy, social support and postnatal depression in multi-racial first-time mothers in Singapore. This study represents the first clinical evaluation of PPP on the composite outcomes of maternal parental self-efficacy, social support and postnatal depression. The PPP in this study demonstrates a partial  $\eta^2$  ( $\eta^2$ ) of 0.76, which indicates that the effect for group differences in the repeated measures triply MANCOVA accounted for 76% of the group-differences plus associated error variance signifying a large effect of the intervention in promoting the composite outcomes of maternal parental self-efficacy, social support and postnatal depression (Cohen, 1988; Pallant, 2007).

### Maternal Parental Self-Efficacy

The statistically significant group and time interaction effect as well as significant group effect on maternal parental self-efficacy were shown between intervention and control groups even after adjusting for demographic characteristics. The findings hence support the effectiveness of PPP in enhancing the maternal parental self-efficacy among primiparas. Mothers who participated in PPP had a drastic increase in



maternal parental self-efficacy both at six and twelve weeks postpartum as compared to mothers who only received routine postnatal supportive care. This suggests that the PPP is effective in enhancing maternal parental self-efficacy in newborn care and the effect is maintained long term until twelve weeks postpartum.

The positive outcome of postnatal psychoeducation intervention in this study supports the fact that various health behaviour changes and adaptations could be achieved by interventions focusing on self-efficacy (Lenz & Shortridge-Baggett, 2002). The intervention delivered in this study was based on the four approaches of increasing self-efficacy, that is, mastery experience, vicarious learning, verbal persuasion and emotional and physiological states (Bandura, 1997). The positive outcomes of this intervention could be due to its multi-modal and multi-dimensional approach.

Multi-modal approach in psychoeducation is based on the fact that various modalities of each individual needs to be addressed when providing support to enhance their psychosocial well-being (Cunningham & Zayas, 2002; Lazarus, 1981). Each individual has their own challenges and strengths and they are affected differently in varied situations that require both individualised and personalised support. Hence, the multi-modal approach in PPP involves the combination of psychosocial interventions to promote physical and emotional well-being for first-time mothers. In this study, first-time mothers were supported with a follow-up home visit during the early postpartum period via a 90-minute educational session. The purpose of the visit was to ensure that mothers were appraised on their successful achievements of newborn care tasks (mastery experience) and were educated on the physical and psychological needs in the early postpartum period according to their individualized needs. During the visit, ample opportunities were provided for skills demonstration (vicarious learning). Additionally, the educational booklet was provided for the reinforcement of newly learned knowledge during the session. After the visit, follow-up phone calls were made addressing mothers' new challenges. Three follow-up phone calls (approximately 30 minutes each) were delivered on a weekly base for three weeks.

Cheal and Clemson (2001) further supported that multi-dimensional interventions including health education, skills practice and mastery experience, role modeling and self-affirming verbal persuasion produced the best results in enhancing self-efficacy.

The process evaluation interviews in the present study concurred that the mothers had benefitted from the combination of components offered by the postnatal psychoeducation programme.

The multi-dimensional approach of enhancing self-efficacy has been successfully used in prior studies (Dijkstra & Wolde, 2005; Elfhag & Rossner, 2005) where a combination of interventions such as adequate social support, affirmations and role modeling were used to promote smoking cessation (Dijkstra & Wolde, 2005) and weight loss (Elfhag & Rossner, 2005). In maternal and child health nursing, the combination of Bandura's (1997) self-efficacy enhancing factors was successful in enhancing maternal self-efficacy for childbirth during the antenatal educational classes (Ip et al., 2009).

A few other studies (Campbell, 1996; Nichols et al., 2009; Noel-Weiss et al., 2006) have used Bandura's (1997) multi-dimensional self-efficacy approach with a particular focus in enhancing breastfeeding self-efficacy. Most of these studies, except Campbell's (1996), delivered education using a multi-dimensional approach during childbirth educational programmes in the antenatal period. However, Campbell (1996), in a breastfeeding promotion intervention focused on both antenatal and postnatal educational support using theory-based multi-dimensional interventions for new mothers.

The present study is the first study of its kind that has focused on enhancing maternal self-efficacy in overall newborn care tasks using a theory-based educational programme, and examined its effect longitudinally at 12 weeks postpartum. The findings of this study add empirical evidence in evaluating the effectiveness of PPP in enhancing maternal parental self-efficacy and social support and reducing postnatal depression among multi-racial primiparas in the early postpartum period.

In this study, the partial eta<sup>2</sup> ( $\eta^2$ ) for the postnatal psychoeducation programme on maternal parental self-efficacy was large (0.41) ( $\geq 0.01$  means 'small effect',  $\geq 0.06$  means 'medium effect',  $\geq 0.14$  means 'large effect') (Pallant, 2007). However, Glass, McGaw and Smith (1981) were critical of using 'small', 'medium' and 'large' approaches in describing the effect, arguing that the effectiveness of a particular

intervention could be interpreted in relation to the other interventions that seek to produce the similar effect. Hence, previous intervention studies designed to enhance childbirth self-efficacy (Ip et al., 2009) among Chinese pregnant women and breastfeeding self-efficacy among Australian pregnant women during the antenatal educational classes (Nicholas et al., 2009) were compared and have demonstrated a medium effect of  $\eta^2 = 0.06$  (Nicholas et al., 2009) and  $\eta^2 = 0.07$  (Ip et al., 2009) respectively. In Nicholas et al.'s (2009) study, the pregnant women were given just a breastfeeding enhancing interactive booklet and in Ip et al.'s (2009) study, the pregnant women had only two 90-minute educational sessions. The large effect of intervention in this study could be due to the multi-modal approach of the PPP.

Braden, McGlone and Pennington (1993) found that there was a positive relationship between the strength of treatment indexed by the amount of time spent on an intervention activity and significant outcome changes over time, suggesting that an increase in the amount of time spent has the potential to increase treatment effectiveness. However, the amount of time devoted to the participants in the current study (180 minutes in total) was somewhat similar to Ip et al.'s (2009) study, and yet there was a difference in the effectiveness of the treatment. This could be due to the group size of the intervention. The present study used one-to-one individualised sessions with first-time mothers at their convenient home environment. The participants might be more satisfied with the one-to-one interventions (D. Johanson, R. Johanson, & Holubec, 1994). Hence, the individualised face-to-face postnatal psychoeducation intervention in the present study could be more effective as compared to a group session of six individuals in Ip et al.'s (2009) childbirth psychoeducational programme. However, having individualised one-to-one sessions could incur extra cost to the healthcare system. Hence, evaluating the cost-effectiveness of the postnatal psychoeducation programme is important in future studies by examining the benefits of the programme to improve maternal outcomes, the costs of providing such a programme to mothers and the health care, social and financial burdens of having postnatal depression, or other negative maternal and newborn health outcomes.

Various strategies were used to enhance treatment integrity in this study including theoretical framework based intervention with a detailed protocol. The same

researcher (Registered Midwife) delivered the intervention to all the participants according to the protocol. The intervention dosage was maintained through a fixed duration of face-to-face session and three follow-up phone calls to answer to additional maternal queries and reinforcement on reading the educational booklet. The process evaluation interviews also supported that mothers were very satisfied with having a good rapport with the same approachable midwife who they met in the hospital and who followed them through home visits and phone follow-up during the postnatal period. Thus, maintaining the continuity of care from the hospital to the postnatal period could be an important component for a successful PPP.

Some previous studies on antenatal education failed to achieve longer term outcomes (Ip et al., 2009; Ngai et al., 2009). For example, Ngai et al.'s (2009) study highlighted that the failure of their antenatal childbirth psychoeducational programme in enhancing the maternal competence and maintaining the long term effect of the intervention was due to the decay of the treatment effects. Nelson (2003) reported that maternal parental self-efficacy was challenged with the stressful demands of the early postpartum period. In this study, the postnatal psychoeducation programme included three follow-up phone calls and an educational booklet to maintain the long-term treatment effects of the intervention at 12 weeks postpartum. The home visit was arranged between days 5-14 post delivery so that mothers had some personal experience in looking after their newborns and received timely feedbacks from the midwife. As the first two weeks postpartum was the most challenging period for mothers, receiving individualized support could have further enhanced maternal parental self-efficacy in newborn care. The participants in the process evaluation commended the timing of home visits was appropriate as it provided them ample time to recover from childbirth as well as opportunities to practice newborn care skills. They could ask questions about their challenges during the home visit. Hence, the combined effects of home visit (specifically its timing), the phone follow-up and the educational booklet in the postnatal psychoeducation programme might maintain the long-term outcomes in this study.

Previous studies (Koniak-Griffin 1993; Mercer, 2004; Schachmn, Lee & Lederman, 2004) have shown that maternal self-efficacy and satisfaction with the maternal role are subjected to numerous personal and environmental influences such as physical

and psychological health, role strain and availability of a support system. Ngai et al. (2009) highlighted the significant association between maternal role competence and social support. The postnatal psychoeducation programme in this study included education on personal and psychological challenges of early postnatal period as well as the contents on promoting social support for new mothers. Specifically, a chapter on family bonding and strategies in seeking help from others was introduced and highlighted to mothers. In addition, family members including husbands, maternal mothers and mothers-in law were encouraged to participate in the educational session during the home visits. This further might have attributed to the higher effect of the postnatal psychoeducation programme in enhancing maternal parental self-efficacy among primiparas that was sustained for a longer period at 12 weeks postpartum. The process evaluation interviews in this study supported that mothers felt more confident after participating in the postnatal psychoeducation programme.

## Social Support

In this study, the statistically significant group and time interaction effect as well as group effect on social support indicated the effectiveness of the postnatal psychoeducation programme in enhancing social support seeking in first-time mothers. The participants receiving the postnatal psychoeducation programme experienced significant improvements in social support from baseline up to 12 weeks postpartum as compared to the control group. Though there was a slight decrease in social support score from six weeks (posttest-1) to 12 weeks (posttest-2) in the intervention group, the social support received by the intervention group was significantly higher as compared to the control group at both six and twelve weeks postpartum.

The positive effect of the postnatal psychoeducation programme in this study is consistent with the social exchange theory (Blau, 1964; Homans, 1961), which highlighted that social support entailed interactions between individuals that enabled them to cope better with stressful life events. Previous studies (Haslam et al., 2006; Tarkka & Paunonen, 1996) found that social support provided stress related aid to cope with major life events such as transition to motherhood. It was also found in

previous literature (Haslam et al., 2006; Leahy-Warren, 2005; Leahy-Warren et al., 2011a; Tarkka & Paunonen, 1996; Tarkka, 2003) that support from both health care professionals and significant others were welcomed by new mothers. Hence, the professional support by midwives and the education on the importance of seeking help from others could be the reason for the success of the postnatal psychoeducation programme in this study. The process evaluation interviews further endorsed that midwifery support enabled mothers to cope better as their queries were answered and they were more open to ask questions and help from others.

Many studies (Johansson & Darj, 2004; Kapp, 1998; Leahy-Warren, 2005; Tarkka & Paunonen, 1996; Tarkka et al., 2000; Wilkins, 2006) in maternal and child health nursing have examined the types of support needed by first-time mothers and the sources of support available to them. The studies found various unmet social support needs of first-time mothers in the early postnatal period. Leahy-Warren (2005) examined the type and source of support of first-time mothers and recommended that different mothers had different types of social support needs from various sources and hence planning of individualised educational programme is crucial for the new mothers.

The postnatal psychoeducation programme in this study was catered to the individual needs of first-time mothers. The midwife provided the informational support on various newborn care tasks, which was reinforced with the educational booklet. The appraisal support in the form of verbal feedbacks was provided to the mothers on their attempts and experiences with newborn care. In addition, the emotional and hands-on instrumental support was provided to the mothers according to their individualised needs. The significant others were encouraged to participate in the face-to-face session (during home visit) so that they were aware of their responsibilities of providing support to the mothers. There was a special section for the new fathers in the educational booklet to enhance their awareness in participating and supporting their partners in newborn care. These could have added to the success of the postnatal psychoeducation programme in this study. In process evaluation interviews, the mothers specifically mentioned the information provided for baby's fathers was useful and they had benefitted from the booklet as a family.

The effect of the postnatal psychoeducation programme on social support was large ( $\eta^2 = .69$ ) (Pallant, 2007). That is, the mothers in the intervention group experienced 69% ( $\eta^2 = .69$ ) better social support as compared to those in the control group. This study was the first to investigate the multi-modal intervention on social support of multi-racial primiparas and the comparison of the results with those from similar interventions on various populations is not possible. A previous intervention study (Reich et al., 2011) that used educational booklet to provide support to the new mothers also had a large effect ( $\eta^2 = 0.30$ ). Reich et al.'s (2011) study mainly focused on enhancing the safety practice of new mothers during the child's first 18 months after birth and included the use of an educational booklet only. Though the effect of the intervention was large, however, the main focus of the study remained only on the safety of the baby.

The large effect of the postnatal psychoeducation programme on social support may be related to the multi-modality of the intervention. The intervention was planned for multi-racial Asian mothers, the culturally specific perspectives including coping strategies, support systems, and cultural beliefs were addressed while educating new mothers. The information in the educational booklet was sensitive to the needs of various ethnic groups and the common traditional myths in newborn care were clarified.

As reflected in the process evaluation interviews, mothers specifically liked the culturally sensitive information in the booklet as many felt that they were not able to find such information in other pregnancy and childbirth related books from other sources. The postnatal psychoeducation programme developed in this study which included individualised education focusing on overall social structure of the new mothers appeared to be highly compatible to traditional cultural values and practices. It might be one of the factors that contributed to its effectiveness.

The intensity and consistency of the intervention could be another success factor for the large effect of the postnatal psychoeducation programme on social support in this study. The same midwife supported the mothers for the entire intervention. The midwife delivered consistent intervention as per the protocol to all mothers in the intervention group. In addition, the mothers were given the same educational booklet

and were constantly reminded of referring to the booklet during each phone follow-up. These might have further added to the effectiveness of the programme.

As mentioned previously, there was a slight decrease in the effect of the postnatal psychoeducation programme on social support at 12 weeks postpartum. This could be explained by the fact that as the baby grows, their needs change and so do the new challenges for the mother (Mercer and Ferketich, 1995). A 12 week time period during infancy brings significant changes in infant behaviours. They become more socially responsive, require few feedings and may have more predictable behaviour. These can pose new challenges and thus more social support needs for new mothers (Pridham, Lytton, Chang, & Rutledge, 1991). Though the educational booklet in the current study covered some of the important milestones of the newborns till 12 weeks of their life, but the contact with midwives were only till 5-6 weeks postpartum. The lack of actual contact with health care professionals after the phone follow-up might have affected mother's perceived social support. To sustain the effect, future intervention programmes could be extended with longer follow-up sessions and additional content on infants' developmental changes to produce longer-term improvements on social support of new mothers.

As reflected in the process evaluation, a number of mothers highlighted the need of revising the contents of the booklet specifically with more information on baby developmental changes. However, the longer follow-up sessions by the health care professionals might not be feasible due to the scarcity of manpower. It may also lead to an additional financial burden to the healthcare system. Co-payments by new mothers and government subsidies on postnatal supportive care would be beneficial. Additionally, instead of midwives' calling the mothers, the new mothers could be provided with hot-line numbers that they could use in case of any queries. Although the hot-line numbers are already available in the study hospital, mothers are not aware of this. Hence, mothers need to be reinforced about the availability of these numbers so that they can seek the necessary support. Similar suggestions of having a hot-line number were also highlighted by some mothers during the process evaluation interviews.



An additional factor that may have influenced the social support of new mothers at 12 weeks postpartum is maternal employment (Nelson, 2003). In previous studies (Leung et al., 2005; Nelson, 2003), mothers' social support needs were found to be increased as they expressed greater concerns for the arrangement of a reliable baby-sitter after they returned to work. Mothers who are Singapore citizens are eligible for four months maternity leave while other mothers who are non-citizen have only two months or less maternity leave (depending on the employer) (Ministry of Manpower, 2013). As the majority of mothers in this study were working mothers, returning to work could have been the reason that influenced their social support needs at 12 weeks. However, this study did not collect the information on the citizenship status of the participants, which could have been beneficial to assess the different social support needs between mothers who returned to work early and those who did not. Future studies need to explore the influence of maternal employment on maternal social support needs among mothers in the longer term postpartum.

### Postnatal Depression

The statistically significant interaction effect between group and time as well as group effect on postnatal depression in the present study indicated the effectiveness of the postnatal psychoeducation programme in enhancing psychological well-being in multi-racial first-time mothers. The participants receiving the postnatal psychoeducation programme experienced a significant decrease in postnatal depression scores from baseline to both six and twelve weeks postpartum. Participants receiving only routine postnatal supportive care showed an initial increase in postnatal depression scores at week six postpartum, followed by a slight decrease at 12 weeks postpartum.

The positive effect of the postnatal psychoeducation programme in the study was consistent with the self-efficacy (Bandura, 1997) and social exchange theory (Blau, 1964; Homans, 1961), which emphasised that enhanced self-efficacy and social support, could improve the psychological well-being. Previous literature (Boyce & Hickey, 2005; Howell et al., 2009; Davey et al., 2011) suggested that among many other factors such as biological and environmental, psychosocial factors such as social support and maternal self-efficacy in performing newborn care tasks were found to

have a greater impact on the development of postnatal depression among mothers. The focus on maternal self-efficacy and social support needs of first-time mothers in the postnatal psychoeducation programme might have contributed to the decrease of maternal postnatal depression scores among first-time mothers.

The qualitative findings from the process evaluation in this study revealed that professional support available for the mothers enabled them to cope better with the stressors of early motherhood as their queries were answered and they felt more competent in looking after their newborns. This enhanced maternal parental self-efficacy, in turn lifted up their moods and they experienced improved emotional well-being. The findings are consistent with those in previous intervention studies (Cunningham & Zayas, 2002; Gao et al., 2010; Fisher et al., 2010), which highlighted that providing individualised support to new mothers could significantly reduce postnatal depression.

In this study, the postnatal psychoeducation programme demonstrated a medium effect with the partial  $\eta^2$  of 0.09 (Pallant, 2007) in reducing postnatal depression. This value was higher than some previous intervention studies for the prevention of postnatal depression (Chabrol et al., 2002; Zlotnick, Johnson, Miller, Pearlstein, & Howard, 2001) but lower than the other (Fisher et al., 2010).

The effect of the postnatal psychoeducation programme in this study was higher than Chabrol et al.'s (2002) cognitive-behaviour session and Zlotnick et al.'s (2001) interpersonal psychotherapy on prevention of postnatal depression. It could be related to the multi-dimensional intervention approach. Cunningham and Zayas (2002) proposed that bundling various psychosocial interventions such as social support and psychoeducation on various newborn care tasks is more effective than any single approach as it tends to offer multiple interventions for multiple problems. The postnatal psychoeducation programme in this study involved an education session based on individualised maternal needs and support by targeting multiple sources such as maternal parental self-efficacy and social support both from health care professionals and significant others. This could be the reason for its effectiveness in enhancing maternal psychological well-being.

However, few previous studies (Brugha et al., 2000; Hayes, Muller, & Bradley, 2001) had less favourable outcomes in influencing maternal psychological well-being. Brugha et al. (2000) used problem-solving skills to reduce depression at three months postpartum and did not find any difference between the intervention and control groups. The authors argued that the low attendance rate (45%) was the reason of participants' not benefitting from the intervention (Brugha et al., 2000).

Similarly, Hayes et al. (2001) did not find the effectiveness of their antenatal educational intervention on first-time pregnant women. Their focus of the intervention was to provide information on the postnatal depression to better prepare the mothers in the postnatal period. However, the authors rationalised that lack of follow-up educational support in the postnatal period was the reason for the ineffectiveness of the programme (Hayes et al., 2001).

In this study, efforts were made to encourage mothers' participation and majority of the participants completed the postnatal psychoeducation programme (89%) as per protocol, which was higher than previous studies (Brugha et al., 2000; Stamp, Williams, & Crowther, 1995). This could have contributed to the positive findings of this study.

Fisher et al. (2010) reported higher effects of their psychoeducational intervention to prevent postpartum mental disorder in first-time parents within six months postpartum when compared with the current study. The medium effect in this study could be related to the fact that the current sample had low baseline postnatal depression scores (Mean = 8.2, SD = 4.1). It might be possible that the effects of the postnatal psychoeducation programmes would be more pronounced in women with more severe depressive symptoms. As suggested by previous studies (Cuijpers, 2003; Dennis, 2005), the effects of preventive intervention for depression would be more evident with a sample of higher risk women. This could also explain the large effect in Fisher et al.'s (2010) study as it included mothers who were diagnosed with postnatal depression.

Another reason for the medium effect may be because the postnatal psychoeducation programme was compared with the routine postnatal supportive care. The routine

postnatal supportive care might have provided some informational support to the mothers on postnatal depression, which then could have reduced the between group contrast. It would have been better to include a placebo group with no support in the study to see the exact effects of the postnatal psychoeducation programme but the placebo group was not used in this study, as it was unethical refraining postnatal mothers from receiving any necessary support.

Dennis (2005), in her systematic review found that psychoeducation interventions are more successful in reducing postnatal depression if they are culturally appropriate and delivered individually rather than in groups especially in the postnatal period. In line with that, Leis et al. (2009) added that for the success of home-based psychoeducational interventions, they should be theory based including diverse groups of population such as ethnic diversity and focusing on prevention rather than the treatment of postnatal depression. The postnatal psychoeducation programme used in this study was prepared based on such recommendations (Dennis, 2005; Leis et al., 2009). This could also be one of the reasons for its success in reducing postnatal depression scores.

The qualitative interviews during the process evaluation showed that the majority of the participants perceived that the postnatal psychoeducation programme was helpful and effective in enhancing their emotional state. Providing information on postnatal depression in the intervention programme seemed to increase the participants' awareness of postnatal depression. This would have enabled them to recognise their feelings and mobilise various coping skills to deal with the negative emotions in the early postnatal period. A chapter in the educational booklet on how their significant others could assist mothers in the early postpartum period might have further enhanced the awareness and support available for first-time mothers.

Previous studies (Mauthner, 1997; Sword & Watt, 2005; Ugarriza & Schmidt, 2006) suggested that mothers often identified emotional challenges as a concern and expressed the need for more information about perinatal depression both in the antenatal and postnatal period. However, studies conducted on Asian mothers (Gao et al., 2010; Lau & Wong, 2008; McIntosh, 1992) highlighted that mothers were often reluctant to admit to experiencing postnatal depression due to ignorance or social

stigma. Especially among Hong Kong Chinese (Lau & Wong, 2008) and Mainland Chinese (Gao et al., 2010) mothers, postnatal depression was considered as a taboo and having such a condition was a shame for the entire family. The culturally sensitive discussions on postnatal depression, reassuring about the normalcy of these feelings during the home visit and phone follow-up, together with information on the educational booklet, could be particularly comforting to multi-racial primiparas in this study.

The attempts of enhancing maternal self-efficacy during the postnatal psychoeducation programme including verbal persuasion, vicarious experience and provision of social support were identified as constructive and useful to first-time mothers. During the process evaluation interviews, the participants quoted examples of motivation by the midwife and availability of different types of support such as emotional support from their husbands and informational support from their mothers and midwife helped them to face the challenges and to be able to go through the demands of infant care. As a result, they tended to feel less stressed and reported lower postnatal depression scores in the early postpartum period. The process evaluation further supported the quantitative findings in this study that the postnatal psychoeducation programme was effective in equipping first-time mothers with various knowledge and skills to enhance their self-efficacy in newborn care and help-seeking behaviour that helped them cope better with the stress during their transition to motherhood. This eventually enhanced their psychosocial well-being.

The present findings highlight the potential impact that enhancing maternal self-efficacy and social support can have on maternal psychological well-being in the early postnatal period. Postnatal depression could have devastating effects on maternal and newborn well-being and in turn on their families. This study provides empirical support for developing a theory-based postnatal education programme as a preventive strategy to enhance overall well-being of primiparas and their families in the early postnatal period.

## Comparison of Results Using Per-Protocol Analysis and Intention-To-Treat Analysis

The findings using both per-protocol analysis on 108 participants who completed the protocol and those using the intention-to-treat analysis on all 122 participants indicated that there was a significant group and time interaction effect and group effect on the composite outcome of maternal parental self-efficacy, social support and postnatal depression. The postnatal psychoeducation was effective in promoting the composite effects of maternal parental self-efficacy, social support and depressive symptoms in multi-racial primiparas.

The findings of the multivariate analysis of variance using per-protocol analysis and intention-to-treat analysis also revealed that there were significant improvements in individual outcomes of maternal parental self-efficacy, social support and postnatal depression between the groups over time from baseline to posttest-2. The effect of the postnatal psychoeducation programme on individual outcomes of maternal parental self-efficacy, social support and postnatal depression were also similar both for per-protocol and intention-to-treat analyses, which explains the sufficient power of the intervention to detect statistical significance by both methods. This highlights that there were comparability of intervention and control groups with no bias resulting from exclusions (Dasgupta, Lawson, & Wilson, 2010). In addition, significant results with per-protocol analysis recommended that there was an undiluted treatment effect (Dasgupta et al., 2010).

## Process Evaluation

### Challenges of Postnatal Period

The qualitative process evaluation interviews after the intervention programme showed that the majority of first-time mothers experienced challenges in early postnatal period. These results were similar to quantitative findings in this study on maternal parental self-efficacy and social support assessed on the day of discharge (baseline data on one to third days postpartum) from the hospital. Mothers felt less confident in performing various newborn care tasks due to lack of knowledge and

experience in performing those tasks such as breastfeeding and soothing the crying baby. They suffered from negative emotions and conflicts due to differing advice and confinement practices.

Most of the participants in this study highlighted that they experienced negative emotions especially the feeling of being lost, fearful and stressful in the early postnatal period. They felt unprepared to take up the challenges of motherhood. These findings were similar to the findings of various previous studies (Kanotra et al., 2007; Leahy-Warren, 2005; Lof et al., 2006; Martell, 2001; Ong et al., 2013), where new mothers felt overwhelmed with the challenges of early postnatal period.

For example, two qualitative studies (Kanotra et al., 2007; Lof et al., 2006) revealed that first-time mothers considered early postnatal period as stressful. Leahy-Warren (2005) found that first-time mothers felt overwhelmed with the demands of newborn care and challenged by the physical, emotional and social changes that ensue after delivery. Martell (2001) confirmed that mothers were not confident about their abilities to care for their infants at the time of discharge from the hospital. They expressed anxiety and fear about the survival and safety of their babies during the first week post discharge. A recent local study (Ong et al., 2013) also found that first-time mothers felt lack of confidence, loss of control and being helpless in performing various newborn care tasks after the early postpartum discharge. Their findings indicated the importance of providing postnatal psychoeducation about newborn care and an understanding of postnatal depression to first-time mothers.

Some mothers in this study especially those who were not Singaporeans experienced a lack of support as there were no family members to depend on in the early postnatal period. These findings are similar to previous studies (Davey et al., 2011; Nahas et al., 1999; Ward, 2003; Yeoun, 2003), which found that being an immigrant in a country; the mothers missed the close support of family networks.

However, those who received adequate support especially from their Singaporean mothers suffered from receiving conflicting advice from their significant others, especially dominating mothers-in-law (Chan et al., 2002; Chee et al., 2005). Similar to previous studies (Chan et al., 2002; Chee et al., 2005), the primiparas in this study

were specifically stressed due to the conflicting confinement practices they had to adhere to. Many mothers felt it was difficult for them to follow certain practices due to the demands of early motherhood. These findings are similar to what was reported in other studies conducted on Mainland Chinese (Wan et al., 2009) and multi-racial local mothers (Chee et al., 2005). The authors (Chee et al., 2005; Wan et al., 2009) found that negative confinement experiences especially for those mothers who did not believe in confinement could be a significant risk factor for postnatal depression. The challenges that mothers face as highlighted in the process evaluation interviews further validated the need to plan supportive interventions for new mothers to enable their smooth transition to motherhood in the early postnatal period.

### Benefits of Participating in Postnatal Psychoeducation Programme

The findings of this study supported that incorporating postnatal psychoeducation programme in the early postpartum period was effective in enhancing maternal parental self-efficacy, social support and reducing postnatal depression among first-time mothers. The postnatal psychoeducation programme was based on self-efficacy (Bandura, 1997) and social exchange theory (Blau, 1964; Homans, 1961) and included a combination of interventions including home visits, phone follow-up and provision of the educational booklet. It was simple and easy to deliver a programme that did not require any special training for the midwife delivering the intervention. In addition, the education provided to mothers was individualised according to their personal needs. The high level of satisfaction with the postnatal psychoeducation programme expressed by mothers in the intervention group indicates that they had high acceptability of the programme and found it worthwhile.

The early postpartum period is a stressful transitional period to motherhood especially for first-time mothers and lack of support could be detrimental both for the mothers and their newborns (Forster et al., 2008; Tarkka et al., 2000). The qualitative data in this study found that maternal confidence and emotional well-being was enhanced after participating in the postnatal psychoeducation programme. Also, mothers tended to seek more help when they were in need. Maternal knowledge on newborn care, self care as well as on breastfeeding was enhanced after the programme. This enabled



them to have a smooth transition to motherhood in the early postpartum period. The postnatal psychoeducation programme in this study had provided the individualised support needed by the mothers that could have benefitted them in their adaptation to motherhood. These findings were supported by previous studies (Cunningham & Zayas, 2002; Miller & LaRusso, 2011) that providing multi-modal support to the mothers according to their individual needs enhanced their physical and emotional well-being.

In contemporary Singapore society, economic growth has put undue pressures on childbearing women due to the demands for higher qualifications and successful careers, leaving them stressed to bear children and less confident in the mothering role (Ng, 2011; Ramesh, 2011). Though the government in Singapore is putting efforts to provide monetary benefits and longer paternity leave of one week for husbands (Ministry of Manpower, 2013), the lack of awareness on the support and education needed by the mothers could make these efforts futile. Also, the early postpartum hospital discharge from as early as day one to three postpartum (Phang, 2009) might have posed an additional stress on first-time mothers to learn parenting skills and acquire the experience necessary to develop competence with an infant. Thus, the postnatal psychoeducation programme seems to provide a valuable platform for first-time mothers to acquire knowledge and skills to be competent mothers and opportunities to learn for the entire family especially husbands and significant others in providing needed support to the mothers.

The participants in this study expressed that they felt confident when they received feedback on their skills performance and their queries were answered. Receiving support during the home visits enhanced their satisfaction and prepared them better to cope with the challenges in early postnatal period. They also felt that performing skills under supervision from a midwife such as bathing the newborn not only enabled them to correct their mistakes but also provided them opportunities to learn the corrected skills from the midwife. The knowledge they received from the experienced midwife about their physical and emotional well-being as well as newborn care tasks further enhanced their confidence.

These findings are congruent with Bandura's self-efficacy theory (1997) that factors such as mastery experience, verbal persuasion, vicarious experience and knowledge about physical and emotional well-being are important in building maternal self-efficacy for successful parenting. It is possible that the postnatal psychoeducation programme in this study gave first-time mothers the necessary support, education and opportunities to learn newborn care skills, to enhance their self-efficacy and emotional well-being. This further supports the clinical significance of the postnatal psychoeducation programme among multi-racial primiparas. Unique to this study, verbal persuasion including timely feedback to mothers on their skills performance and knowledge deemed crucial in enhancing self-efficacy of new mothers.

### Factors Influencing the Effectiveness of Postnatal Psychoeducation Programme

The effectiveness of the postnatal psychoeducation programme seems to be facilitated by multi-modal interventions used in delivering the programme. The participants highlighted various strengths of the postnatal psychoeducation programme such as the programme being convenient and helpful as it was delivered at their comfortable home environment. Previous studies (Bashour et al., 2008; Bennett & Tandy, 1998; Johansson et al., 2010; Lock & Gibb, 2003) also reported that mothers felt more secure and supported by midwives in their non-threatening familiar home environment. The support by midwives at their home has provided them a sense of control, adequate rest, safety and confidence in looking after their newborns.

The participants appreciated the midwife's ability to interact and establish a trusting relationship with them in this study. They also valued opportunities to ask questions and the assurance that the answers would be forthcoming. Similarly, Rossiter et al. (2012) attributed the success of their home-based intervention to the positive relationship with the care provider and the reassurance mothers experience on receiving the support in their convenient home environment. There is no existing home-based postnatal supportive educational programme for the mothers in Singapore (Phang, 2009). This suggests a need to incorporate such programmes in the early postnatal period for new mothers.

Written resource in the form of an educational booklet seemed to enrich participants' learning and enhance the effectiveness of the programme. The educational booklet was aimed to be a supplement to in-house teaching in the hospital and to reinforce the contents of the educational session conducted during the home visit. As mentioned by the participants that whenever they forget something, they often referred to the book for reinforcement of what the midwife taught during the home visit. The participants felt assured as they knew they had something to refer to after the home visit. The educational booklet was applauded as it was easy to comprehend with big font sizes and colourful pictures as well as information being presented in point form. The participants especially mentioned that they valued the booklet as the contents in the booklet included the content page, reading list and more importantly the phone contacts provided to them in the booklet in the case of an emergency. The majority of the mothers also liked the size of the booklet as they felt it was easy to handle and that they could manage to read it even when they were breastfeeding. Previous studies (Berger & Cook, 1998; Renkert & Nutbeam, 2001) also reported that mothers, especially those having the first child, favored the use of written resources as the material is available for review at any time.

Wilkins (2006) interviewed British mothers in order to have an in-depth understanding of the factors that enabled mothers' coping in the early postnatal period. The mothers verbalised the importance of having easy read reference guides and phone follow-up especially after the hospital discharge during the unavailability of the midwives. This further recommended the need of having supplementary educational materials for the mothers in the early postnatal period. Currently, public hospitals in Singapore provide pamphlets, which usually cover topics such as jaundice in newborns and do not include holistic information related to newborn care, maternal self-care and psychological well-being. The educational booklet produced for the current study that included the contents of the postnatal psychoeducation programme can be a supplement to the existing pamphlets in the hospital. As suggested by the participants of this study, the educational booklet needs to be continuously updated with more evidence-based information.

The timing of the intervention was another reason for the success of postnatal psychoeducational programme. The literature has shown that the early postnatal

period is a stressful transition period to motherhood (Bashour, et al., 2008; Forster et al, 2008) and maternal supportive needs are at its peak within the first 4-6 weeks post delivery (Wilkins, 2006). Hence, the postnatal psychoeducation programme delivered within the first 4-6 weeks post delivery could have provided the necessary support needed by the mothers according to their individual needs. Many participants in the process evaluation highlighted the appropriateness of the timing of the intervention as they felt being exposed to their newborns to ask relevant questions during the home visit.

Some of the participants in this study suggested having more than one home-visit and frequent phone follow-up that might not be logistically feasible due to added financial burden on the healthcare system and manpower constraints. Previous studies (Bashour et al., 2008; Lock & Gibb, 2003) have found that it is the contents and not the frequency of the home-visits that matters and having one or more home visits will lead to similar outcomes. Similarly, a literature review (Dennis & Kingston, 2008) found that the duration and number of phone calls did not impact the outcomes of new mothers as the focus remained on their needs. The success of the postnatal psychoeducation programme in this study confirmed that the single home-visit and phone follow-up were adequate in influencing maternal parental self-efficacy, social support and postnatal depression of new mothers facilitating the smooth transition to motherhood in the early postpartum period.

The participants in this study highlighted that the programme saved a lot of cost for them, as they did not require traveling with the baby to participate in this programme. Also, as the midwife answered many of the mothers' queries, cost savings were realised by not having to go to doctors. They also felt that the recruiting criteria in this study based on lucky draw slips provided them a fair chance to be selected in the intervention group. Specifically, foreign mothers felt reassured as they were provided an equal chance to participate in the programme. Thus, in addition to the support received, participating in postnatal psychoeducation programme could have enhanced maternal trust about the programme and hence in turn, their motivation to learn. This could be further explained by one of the adult learning theory principles (Knowles, Holton & Swanson, 2005) that adults are motivated to learn when their need to know is aroused by intrinsic value of new knowledge as well as by external personal

rewards. The fairness without any discrimination and convenience of the postnatal psychoeducation programme could have provided external personal rewards to new mothers and in turn a motivation to learn through doing.

Through experiencing the benefits and strengths of the postnatal psychoeducation programme, the participants recommended that it should be offered as a routine postnatal supportive care after the hospital discharge. Some mothers even suggested relieving the undue burden of prolonged continuous support of additional home visits and phone follow-up with web-based learning to provide additional support to new mothers. They recommended having an online chat, forum or a Facebook page created for them so that they could pose their queries at anytime of the day. They felt that it would also be less straining for the midwives as they would not have to repeat themselves too many times as the mothers would be able to learn from the previously answered queries. Mothers felt that web-based learning would be effective, as it would not require them to leave the comfort of their homes. Through such web-based learning, the possibility of a longer-term support system would also prevail. Hence, future studies could consider planning a web-based educational programme for the new mothers and also evaluating its cost-effectiveness as compared to the current postnatal psychoeducation programme and routine postnatal supportive care in Singapore.

### Strengths of the Study

This study is first of its kind that tested a salient, well-accepted, well-theorised, timely, non-stigmatising psychoeducation programme on first-time mothers and their families. The first-time mothers have benefitted from enhanced maternal parental self-efficacy, social support and psychological well-being. Compared with previous studies (Fisher et. al., 2010; Rowe & Fisher, 2010), this study used a more stringent design to evaluate the effects of the postnatal psychoeducation programme among first-time mothers. As such, the randomised controlled trial, which is the most rigorous way of determining whether a cause and effect relation exists between intervention and outcome (Sibbald & Roland, 1998) was used in this study. The participants were allocated randomly to intervention and control groups, which reduced the selection bias, the common methodological limitation found in previous

studies (Fisher et al., 2010). It also enhanced the internal validity as equivalence between the intervention and control groups could be guaranteed through randomisation. It is considered one of the major strengths of this study.

This study has provided empirical evidence on the effectiveness of a theory-based psychoeducation programme. It has extended the literature by filling the gaps and addressing the recommendations of need of continuity of care in the early postpartum period based on previous studies. Most of the interventions planned for the postnatal period in the previous studies (Gunn et al., 1998; Morrell et al., 2000; Reid et al., 2002) were often conducted without a specified theory base. Also, many previous studies (Beck, 1998; Leahy-Warren et al., 2011a; Montigny & Lacharite, 2005; Ngai et al., 2010) recommended planning interventions based on strong theories or conceptual frameworks to optimise the treatment strength and increase the likelihood of detecting the true treatment effect. As such, the postnatal psychoeducation programme of this study was built on a conceptual framework based on Bandura's self-efficacy (1997) and Social exchange theory (Blau, 1964; Homans, 1961). Outcome variables included maternal parental self-efficacy, social support and postnatal depression were conceptually congruent with both the theories. A clear theoretical framework was identified as a crucial element in the development of interventions, which provided a better understanding of the mechanism accounting for the changes in the study outcomes (Medical Research Council, 1997). Hence, having a conceptual framework in this study is another main strength of this study.

Furthermore, the contents of the postnatal psychoeducation programme were prepared based on local cultural norms. Providing clear information and correcting misconceptions were the strengths of this study. The voluntary participation of the mothers with low attrition rate of only 11%, showed that mothers felt motivated to participate in the study. The attrition rate in this study (11%) was lower when compared with previous studies (20%-50%) (Gunn et al., 1998; Ip et al., 2009; Morrell et al., 2000; Reid et al., 2002, MacArthur et al., 2002). This may be attributed to various reasons such as benefits mothers received after participating in this programme, strategies used to enhance participants' compliance including developing a well-structured intervention protocol with culturally competent content which was found useful and satisfactory by the participants. Also, delivering the programme at

the convenience of mothers' homes with follow-up phone calls could be the reasons of participants' trust and motivation to continue to participate in this programme.

The small number of participants who violated the protocol had similar demographic profiles when compared with those who completed the study protocol. Hence, potential bias to the findings is likely to be minimal. The missing data (7%) in this study was minimal and was managed by conducting intention-to-treat analysis using imputation by unconditional means and last observation carried forward methods. These two methods are clinically realistic and robust as it minimises the selection bias, retains the sample size and maintains the statistical power to provide better estimate of the treatment effect (Molenberghs et al., 2004). By taking into consideration the participants' compliance and attrition rates, the intention-to-treat analysis provides the best effectiveness of an intervention in clinical situations (Sibbald & Roland, 1998; Whittaker et al., 2006). Many other longitudinal intervention studies conducted in the postnatal period had reported intention-to-treat analysis with a high statistical power (Fisher et al., 2010; Gunn et al., 1998; Morrell et al., 2000; MacArthur et al., 2002). Hence, the intention-to-treat analysis in this study is robust enough in providing the evidence to support the clinical effectiveness of the postnatal psychoeducation programme among multi-racial primiparas.

The instruments used in this study were culturally validated and pre-tested with good validity and reliability. The EPDS scale is well used among Singaporean women in the perinatal period. However, PMPS-E and PICSS scales were used at the first time to assess maternal parental self-efficacy and social support among Singaporean women. Hence, it was important to test the validity and reliability of these instruments to ensure their cross cultural usage (Portney & Watkins, 2000). Before evaluating the effectiveness of the postnatal psychoeducation programme, the validity and reliability of outcome measures including PMPS-E and PICSS were established among local multi-racial Singaporean mothers in the Phase I study. As through reliable and validated instruments, the credibility of research findings could be assured (Portney & Watkins, 2000).

To enhance the internal validity of the study, the same researcher following a standardised intervention protocol delivered the intervention. The intensive and same

amount of dosage (90 minutes home visits + educational booklet + three phone follow-up not exceeding 30 minutes each) was given to all the participants in the intervention group. This helped to maintain the consistency and eliminate any discrepancies in the intervention delivery and thus could have been responsible for producing positive outcomes (Shaw et al., 2006). In addition, rather than just offering support, the intervention included psychoeducation which provided knowledge, learning opportunities, skills training and timely feedback at a vulnerable life-stage of the first-time mothers.

The confounding variables related to maternal parental self-efficacy, social support and postnatal depression were statistically controlled. Repeated measures analysis of covariance was used to control the demographic characteristics such as age, ethnicity and employment status. By adjusting the initial differences, more reliable findings regarding the effects of postnatal psychoeducation programme on the outcome variables were obtained. The repeated measures analysis of covariance using percentage changes of the outcome measurements could further control the individual differences, which could increase statistical power as the variability due to individual differences is removed for the error term (Stevens, 2002). Thus, the present findings are promising in establishing the causal effect of postnatal psychoeducation programme on maternal outcomes including maternal self-efficacy, social support and postnatal depression.

The maternal outcomes such as self-efficacy evolve over time (Leahy-Warren & McCarthy, 2010; Ngai et al., 2010). Hence, in this study, data were collected longitudinally at three time points including baseline (on day of discharge from day one to third postpartum), posttest-1 (immediately after the intervention at six weeks postpartum) and posttest-2 (at 12 weeks postpartum). Mercer and Walker (2006), in their review on maternal adaptation noted that the studies evaluating the short-term effects of interventions might not show significant results. Thus, the longitudinal follow-up measurements at multiple time points in this study provided valuable information on both short-term and long-term effects of postnatal psychoeducation programme.



Finally, to evaluate the effectiveness of postnatal psychoeducation programme, both the qualitative and quantitative data were collected. This helped to strengthen and substantiate the validity of the findings in the study (Sandelowski, 1996). To capture the in-depth understanding and impact of postnatal psychoeducation programme, which was difficult to capture by quantitative measures, the qualitative measures in the form of process evaluation interviews were used. The process evaluation helped to clarify the underlying mechanism and components of the postnatal psychoeducation programme responsible for producing desirable effects (Breitmayer et al., 1993). This provided a better understanding of the conceptual link between the intervention process and the outcome. The process evaluation yielded important information concerning mothers' opinion on the contents, activities, delivery methods of the intervention as well as the benefits and strengths of the programme thus assessing the quality and clinical significance of the programme. This in turn has implications both for the improvement of the programme as well as the direction of future research.

#### Limitations of the Study

This study has some limitations. The sample selection criteria limited the generalisation of the findings to only low risk, English speaking, and healthy primiparas with uncomplicated childbirth and without past psychiatric history. Therefore, the results may not be transferable to non-English speaking mothers with identified vulnerabilities and/or complicated childbirth. The sample was recruited using probability sampling from one public hospital, thus, representing only a small stratum of homogeneous well-educated, married, higher income group and working first-time mothers in Singapore which further limit the generalisability. Due to resource constraints, data collection was solely based on participants' self-report and was not verified from other sources such as husbands and family members. Replication of this study with more diverse study groups such as teenage, single mothers, multiparas, mothers with multiple births and collecting data both from participating mothers and family members will provide further evidence about the effect of postnatal psychoeducation programme in a multi-racial society.

It was not possible to blind participants regarding their study allocation as the intervention group was receiving home visits which were an obvious new

involvement. Participants' knowledge about their treatment status can influence their responses and bias the results especially when the subjective measurements are collected (Portney & Watkins, 2000). However, the participants in this study were constantly reminded to remain objective and provide honest feedback, as it would then assist in improving the programme further for it to be considered as a standard care in Singapore. That could have been the reason mothers gave lots of ideas on improving the programme such as introduction of web-based learning. Furthermore, the random allocation of treatment was effective in equally distributing the most measured variables across intervention and control groups.

The researcher was not blinded to the post intervention data collection that could affect any pre-conceived expectations on the intervention effect leading to a systematic bias in observation (Portney & Watkins, 2000). However, it was considered the best approach as the researcher had established good rapport with the mothers and this encouraged a higher response rate. Meanwhile, the research was aware of the importance of being objective while collecting data and remained reflective of her values and beliefs by keeping a journal.

Another limitation is that the same researcher who delivered the intervention carried out the process evaluation interviews. This might have affected the credibility of the findings as the participants might feel an obligation to please the researcher by providing positive feedbacks only (Polit & Beck, 2006). Nevertheless, this approach was deemed appropriate given that the quality of the interview data depends to a great extent on participants' trust and rapport with the interviewer and the participants in this study requested to be interviewed by the same researcher who had developed a trusting relationship with them. To minimise the potential desirable responses and to get a more genuine response of participants' experience of the interventions, the participants were reminded to express their honest and objective opinions without right and wrong answers. They were reinforced with the assurance that their feedbacks would enable the improvement of the programme further. In addition, the interviews were audio-recorded which the second researcher listened to before confirming the themes and sub-themes derived from the transcripts. This was to avoid bias during the data analysis. The fact that findings from the process evaluation interviews complemented the quantitative findings, this then provided further support

for the credibility of the qualitative process evaluation interviews. However, the process evaluation interviews were performed only on mothers in the intervention group. Involving mothers from the control group in the process evaluation would have provided better understanding on maternal views on the overall postnatal care available for first-time mothers in Singapore. Specifically, when there were statistically significant differences on the baseline MPSE scores between the control and intervention groups (mothers in the control group had higher MPSE scores), interviewing mothers from the control group would have provided less bias and holistic picture on the effectiveness of postnatal psychoeducation programme and the routine postnatal supportive care received by first-time mothers. Hence, future studies should consider process evaluation from both intervention and control groups.

Although possible confounding factors such as various demographic characteristics were identified and statistically controlled to ensure the equivalence of groups before the intervention, the two groups might have differed in other characteristics such as infant temperament, infant gender and breastfeeding duration and experience and interpersonal conflicts which might have been associated with maternal self-efficacy, social support and depression symptoms (Elek, Hudson, & Bouffard, 2003; Froman & Oven 1990; Hess, Papas, & Black, 2002; Nichols et al., 2009). Thus, the present findings must be interpreted cautiously and the future studies should consider the effect of these confounding factors.

### Implications for Clinical Practice

The study has several valuable implications for the improvement of clinical practice. Based on quantitative findings and process evaluation interview findings, recommendations are made in the following sections for the development and implementation of postnatal psychoeducation programme in Singapore. The findings support the applicability of Bandura's self-efficacy theory (1997) and social exchange theory (Blau, 1964; Homans, 1961) in maternal and child health nursing specifically, in the early postpartum period. The study provides empirical support for the feasibility and effectiveness of using postnatal psychoeducation programme in enhancing maternal parental self-efficacy, social support and postnatal depression to

facilitate a smooth transition to motherhood. Midwives can incorporate self-efficacy enhancing factors such as providing opportunities for skills practice (mastery experience), demonstrating skills for vicarious learning, providing verbal feedbacks (verbal persuasion) and educating on physical and emotional well-being to promote adaptation to motherhood as early as when the mothers are still in the hospital. Midwives can also focus on providing all types of functional support such as emotional, informational, instrumental and appraisal as well as encouraging family members including husbands and maternal mothers to support new mothers especially first-time mothers to promote maternal and newborn well-being. It is vital that maternal parental self-efficacy, social support and postnatal depression are assessed while mothers are still in the hospital so that those who are at risk could be identified and individualised care can be planned and provided to these mothers. Although this intervention programme was only conducted on primiparas, the programme can be used for multiparas to improve postnatal outcomes. Future studies could consider evaluating the programme on this group of mothers.

The postnatal psychoeducation programme is suitable for clinical use as it is relatively brief and can be delivered by postnatal unit nurses after minimal training. The booklet prepared during the programme is concise, holistic and evidence based and thus can be used to educate mothers routinely in the postnatal wards and for reinforcement when they go home.

Given that the early postpartum period was very stressful for new mothers who face physical, social, emotional as well as self and newborn care challenges, it could be a difficult transition period for the adaptation to motherhood that may pose threats to their psychological well-being. Postnatal depression is a costly public health problem that cannot be ignored. Especially when the sequel are poor quality of parenting behaviours that may ultimately influence newborns' cognitive, emotional and behavioural development (Brown et al., 2005; Mckellar et al., 2006; Wilyman-Bugter & Tucker, 2004). The potential benefits of the postnatal psychoeducation programme to prevent postnatal depression may help reduce healthcare costs due to the treatment of postnatal depression, which could be a major financial and social burden on the society. In addition, it also helps to improve the maternal and newborn well-being.

Though the programme showed the effectiveness of improving maternal outcomes, it is unlikely that face-to-face professionally facilitated supportive programmes will reach everyone. It could also be an added financial burden on the health care system to facilitate home visits. Hence, it would be good to make these visits available at an affordable price for mothers. The average monthly salary for a midwife in Singapore is S\$4000 and they work 42 hours per week. The postnatal psychoeducation programme for an individual mother comprises approximately three hours of contact (about 90 minutes face to face and 90 minutes via 30 minutes each phone follow-up) and an educational booklet, which costs approximately S\$12 per copy. Hence, the entire postnatal psychoeducation programme would approximately cost S\$84 per person or more, when considering the transportation timing and cost. The mothers could either pay out-of-pocket or via insurance or government-subsidies depending upon their financial state. Maternity Medisave Package which covers the medical expenses for the delivery and pre-delivery only (Central Provident Fund Board, 2012) could be made available to be used for this postnatal supportive care. In addition, policy makers could implement subsidies for the antenatal classes and postnatal home visits to all the first-time mothers.

To enable the programme to reach out to more mothers, the use of web-based postnatal psychoeducation programmes could be explored to provide long-term support to new mothers. This would avoid the undue burden of midwives having to repeat themselves in answering the mothers' queries through phone calls. While all the mothers felt secure and satisfied with home visits, web-based learning could be an alternative to home visits. Also, it could be worthwhile to test if the educational booklet alone with phone follow-up is effective in enhancing maternal parental self-efficacy, social support and reducing depression when compared with the home visits.

There is a need to adopt a family-centered approach in maternity care. Seeing the importance of social support in new mothers' life, it would be important to include more family-centered education in the curriculum of midwifery and nursing education. Nurses and midwives should be encouraged to pay more attention to the mothers' own resources such as emotional and social networks when planning and implementing nursing care.

In order to reach out to more women and provide concrete support for the realistic adaptation to motherhood, it would be good to start preparing them from as early as the antenatal period as there is a missing link from the antenatal to postnatal education. Especially when the maternal parental self-efficacy evolves over time (Ngai et al. 2011), providing them information on what is expected in the postnatal period early might allow for better adaptation. Donaldson (1991) highlighted the importance of providing longitudinal interventions with multiple treatment episodes in particular, during the early postpartum. Hence, the current postnatal psychoeducation programme could be revised to perinatal psychoeducation programme by combining it with the antenatal educational programme. The focus of the programme should go beyond the childbirth preparation to the smooth transition to motherhood for their and newborns' well-being.

In Singapore, the model of maternity health care service is mainly obstetrician-led care. The doctors provide care for the pregnant women and new mothers with the aid of midwives and nurses (Phang, 2009). Like many countries including Australia, UK and USA, the alternative models of care in the postnatal period, such as midwifery-led care, can facilitate a more woman-centered approach. This care model has been recently introduced in two public hospitals in Singapore. Currently, the focus of midwifery-led care is for providing antenatal and childbirth education. However, due to their one-to-one approach, these midwives can easily extend their care by incorporating the postnatal psychoeducation programme in the early postpartum period.

The rapport with the care provider is an important aspect as highlighted by the participants in the process evaluation interviews that they were able to open up and ask questions, as the midwife was very approachable and they could trust her. Hence, educating and emphasizing the staff on communication and counseling, particularly in newborn care, may improve services so that the mother's individual needs can be met (Persson, Fridlund, Kvist, & Dykes, 2011).

The self-efficacy theory (Bandura, 1997) and social exchange theory (Blau, 1964; Homan, 1961) highlighted the importance of sources of influence. Hence, exposing first-time mothers to someone who has gone through or has similar experience could provide more authentic and a less intimidating environment for learning. As such,

peer support groups could help strengthen maternal parenting support. Many previous studies (Ngai et al., 2010; Nichols et al., 2009; Reece, 1993; Rowe & Fisher, 2010; Whittaker & Cowley, 2012) have highlighted the importance of peer support groups for first-time mothers. The mothers can learn better from someone similar to them as they could relate and appreciate the accomplishment of their peers. Therefore, organisation of peer support groups for the first-time mothers could be considered.

### Recommendations for Future Studies

This study is the first study that provides evidence on the effectiveness of a postnatal psychoeducation programme on maternal parental self-efficacy, social support and postnatal depression with a medium to large effect. Thus, this novel programme requires further testing in a pragmatic cluster randomised trial involving other hospitals to capture the nationwide perspective. The findings of this study are positive but a number of issues necessitate further study.

Future study is needed to examine the cost incurred by the postnatal psychoeducation programme and to analyse the cost-effectiveness of the programme. It could be cost-effective to deliver this intervention realising its potential benefit of reducing postnatal depression, which is a major healthcare burden in maternal and child health discipline. However, evidence is needed to support this assumption.

The support received during the postnatal psychoeducation programme could also influence maternal future reproductive decisions (Ong et al., 2013) as mentioned by several mothers in the process evaluation interviews. This could then address the declining birth rate, which is one of the most crucial issues in contemporary Singapore. Hence, collecting data longitudinally beyond six months would be appropriate to assess maternal views on having a second child and assessing the indirect influence of the programme on birth rate.

Future study should examine alternative methods of providing postnatal psychoeducation programme such as web-based intervention and to analyse the cost-effectiveness of such intervention as compared to the intervention used in this study and the routine postnatal supportive care. In addition, studies on longitudinal

psychoeducation interventions, which begin in the antenatal period and through the postnatal period should be conducted.

As the mothers and fathers differ in their parental self-efficacy in the early postpartum period (Salonen et al., 2009), and the focus of postnatal psychoeducation should be family centered, future studies are needed to involve both first-time mothers and fathers and/or significant others such as maternal mothers or mothers-in law. There is a need to understand their needs and to test the effectiveness of postnatal psychoeducation programme from the perspectives of the main caregiver who is involved in the programme.

Future study is needed to determine whether the findings can be applied in general to the other groups of mothers such as those from a lower income group. Anecdotal evidence underline that these group of mothers default on antenatal check-ups, do not attend antenatal classes and opt for early postnatal discharge from the hospital at their own risk. Women who were well-educated, belonged to high-income groups and working first-time mothers realised the beneficial effects of postnatal psychoeducation programme. It would also be worthwhile to evaluate the effectiveness of the postnatal psychoeducation programme with the other groups of women such as multiparas, adolescent mothers, single mothers, mothers with multiple births, and complicated childbirth. This will not only enhance the generalisability of results and facilitate future development of postnatal support for high-risk mothers.

Singapore is a multi-ethnic country where the prevalent spoken languages are English, Chinese, Malay and Tamil. There is a recent influx of immigrants from Mainland China, India, Philippines and Myanmar (Singapore Department of Statistics, 2012). Previous literature suggested that migrants who were not fluent in the native language might experience communication problems when accessing healthcare (Huang & Mathers, 2008). Hence, future study is needed in Singapore to extend the postnatal psychoeducation programme in common native languages including Chinese, Malay and Tamil.

Future studies could also investigate the impact of infant temperament, infant gender and breastfeeding duration and experience, inter-personal conflicts and marital and parenting satisfaction (Elek et al., 2003; Froman & Oven 1990; Hess et al., 2002;



Nichols et al., 2009) on maternal self-efficacy, social support and postnatal depression). These factors might influence maternal outcomes.

Finally, to capture the long-term effects of the postnatal psychoeducation programme, it is important that future study collects data beyond three months. The Singaporean working mothers are given four months of maternity leave (Ministry of Manpower, 2013), and going back to work is an important milestone that could add stress to new mothers. Hence, examining their parental self-efficacy, social support and depression symptoms beyond four months would provide the information on the long-term effectiveness of postnatal psychoeducation programme.

## CHAPTER 7 CONCLUSION

The stressful early motherhood, lack of social support, feelings of low maternal self-efficacy coupled with increasing evidence of postpartum depression and above all early hospital discharge, challenge midwives to provide adequate postnatal support to first-time mothers. The support in the form of educational programmes is specifically needed for first-time mothers' adjustment during the critical role transition in the early postpartum period.

This is the first study in Singapore to examine the effectiveness of a postnatal psychoeducation programme based on the self-efficacy theory and social exchange theory in enhancing maternal parental self-efficacy, social support and psychological wellbeing among multi-racial first-time mothers. The study used a rigorous research design including gold standard randomised controlled trial to examine the short-term and long-term impacts of the postnatal psychoeducation programme on maternal outcomes at six weeks and twelve weeks postpartum.

The postnatal psychoeducation programme incorporated education and opportunities to facilitate mastery experience, vicarious experience, verbal appraisal to promote physical and psychological well-being of the mothers and their newborns. Both functional (informational, instrumental, appraisal and emotional) and structural (from health care professional and significant others) social support was the focus of the postnatal psychoeducation programme to help mothers cope with the emotional demands and complexities of new motherhood.

The findings supported that the postnatal psychoeducation programme developed in this study is effective in enhancing maternal parental self-efficacy, strengthening social support and reducing postnatal depression in first-time mothers. The qualitative findings revealed that the postnatal psychoeducation programme was well accepted by the first-time mothers and was considered beneficial in enhancing their confidence in taking up the maternal role. It also enhanced their help-seeking behaviour and with the added knowledge and support, mothers' psychological wellbeing was strengthened.

Given the positive outcomes of the intervention, the postnatal psychoeducation programme appears to be a promising intervention to be introduced to the multi-racial first-time mothers in Singapore. The challenges of postnatal period with declining maternal self-efficacy and evidence of postnatal depression suggest that it would be worthwhile to devote more resources and attention from the government and health care system to promote the smooth transition to motherhood. Specifically, healthcare providers and the Singapore government can work towards promoting positive postnatal supportive care experience for the first-time mothers and their families by incorporating the intervention developed and tested in this study, which in turn could enhance maternal and infant health and might influence the low birth rate in Singapore. Future studies are needed to determine the effectiveness and cost-effectiveness of web-based and home-based perinatal psychoeducation programmes for the promotion of maternal and newborn wellbeing in the early perinatal period.

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## APPENDICES

### Appendix 1

#### Perceived Maternal Parental Self-Efficacy instrument (PMP S-E)

©Barnes & Adamson-Macedo (2007)

[Instructions] The following statements describe what some new mothers believe about how they interact with their infants. After reading each statement, please completely fill in the circle, which you feel most closely, describes how you feel about yourself in relation to interacting with your baby in hospital/home. Because these are statements about beliefs, there are no right or wrong answers. Please answer each of the 20 questions below.

S. No.	Questions	Strongly agree	Agree	Disagree	Strongly disagree
1.	I am good at keeping my baby occupied	4	3	2	1
2.	I am good at feeding my baby	4	3	2	1
3.	I am good at changing my baby	4	3	2	1
4.	I am good at bathing my baby	4	3	2	1
5.	I can make my baby happy	4	3	2	1
6.	I can make my baby calm when he/she has been crying	4	3	2	1
7.	I am good at soothing my baby when he/she becomes upset	4	3	2	1
8.	I am good at soothing my baby when he/she becomes fussy	4	3	2	1
9.	I am good at soothing my baby when he/she is continually crying	4	3	2	1
10.	I am good at soothing my baby when he/she becomes more restless	4	3	2	1
11.	I am good at getting my baby's attention	4	3	2	1
12.	I believe I can tell when my baby is tired and needs to sleep	4	3	2	1
13.	I believe I have control over my baby	4	3	2	1
14.	I can tell when my baby is sick	4	3	2	1
15.	I can read my baby's cues	4	3	2	1
16.	I am good at understanding what my baby wants	4	3	2	1
17.	I am good at knowing what activities my baby does not enjoy	4	3	2	1
18.	I believe my baby responds well to me	4	3	2	1
19.	I believe that my baby and I have a good interaction with each other	4	3	2	1
20.	I can show affection to my baby	4	3	2	1

## Appendix 2a

### Functional Perinatal Infant Care Social Support Scale ©Leahy-Warren 2007

[Instructions] The following statements ask about the professional or family Support you believe you are getting now that your baby is born (Hospital/Home). After reading each statement, please completely fill in the circle, which you feel most closely, describes your experience. Because these are statements about beliefs, there are no right or wrong answers. Please CIRCLE your answer for all 16 questions below.

4= Strongly Agree; 3= Agree; 2=Disagree; 1= Strongly disagree

S. No.	Questions	Strongly Agree	Agree	Disagree	Strongly Disagree		
1.	I get information on infant:						
	a. feeding	4	3	2	1		
	b. changing/dressing	4	3	2	1		
	c. comfort/settling	4	3	2	1		
2.	I get information on taking care of my body after childbirth	4	3	2	1		
	3.	I learn from other mothers' experiences	4	3	2	1	
		4.	I get consistent information regarding infant care	4	3	2	1
			5.	I get hands on help with infant:			
a. feeding				4	3	2	1
b. changing/dressing	4			3	2	1	
c. comfort/settling	4	3		2	1		
6.	I have someone to help me with routine housework	4	3	2	1		
	7.	I am not on my own in taking care of the baby	4	3	2	1	
		8.	I have time for myself	4	3	2	1
			9.	I have people to count on when things go wrong	4	3	2
10.				I have someone to care and comfort me	4	3	2
	11.			I have someone to talk to about the way I am feeling	4	3	2
		12.		If I need advice there is someone who will assist me to work out a plan for dealing with the situation	4	3	2
			13.	I have people to talk to and share my experiences with	4	3	2
14.				I am shown appreciation for the care I give my baby	4	3	2
	15.			People close to me understand that it is okay for me to need help	4	3	2
		16.		I get positive feedback from professionals about the care I give my baby	4	3	2

## Appendix 2b

### Structural Perinatal Infant Care Social Support Scale ©Leahy-Warren 2007

[Instructions] From the following list of people, please indicate by a tick (✓) the persons who are supportive and helpful to you in caring for your baby at this time.

If any of the people below are not applicable or relevant please leave blank (tick more than one person as necessary)

Support provided	Husband/ Partner	Parents	Parents-in-law	Siblings	Friends	Neighbor	Nurse/ Midwife	Doctor	Others, Please specify.
1. Provide information about caring for my baby (e.g. feeding, changing, bathing and settling your baby)									
2. Carry out infant care tasks (e.g. feeding, changing, bathing and settling your baby)									
3. Show that they care, love and respect me since I had baby									
4. Praise me for doing a good job in caring for my baby									
5. The length I have got to know this person (e.g. days, months of years)									
6. The frequency I contact with this person (by phone/mail/visit) e.g. daily, monthly, yearly									

### Appendix 3

#### Modified Perceived Maternal Parental Self–Efficacy instrument (PMP S-E)

©Barnes & Adamson-Macedo (2007)

[Instructions] The following statements describe what some new mothers believe about how they interact with their infants. After reading each statement, please completely fill in the circle, which you feel most closely, describes how you feel about yourself in relation to interacting with your baby in hospital/home. Because these are statements about beliefs, there is no right or wrong answers. Please **CIRCLE** your answer for all 17 questions below.

4= Strongly Agree; 3= Agree; 2=Disagree; 1= Strongly disagree

S. No.	Questions	Strongly Agree	Agree	Disagree	Strongly Disagree
1.	I am good at feeding my baby	4	3	2	1
2.	I am good at changing my baby	4	3	2	1
3.	I am good at bathing my baby	4	3	2	1
4.	I can make my baby happy	4	3	2	1
5.	I can make my baby calm when he/she cries	4	3	2	1
6.	I am good at soothing my baby when he/she becomes more restless	4	3	2	1
7.	I am good at getting my baby's attention	4	3	2	1
8.	I believe I can tell when my baby is tired and needs to sleep	4	3	2	1
9.	I believe I have control over my baby	4	3	2	1
10.	I can tell when my baby is sick	4	3	2	1
11.	I can read my baby's cues	4	3	2	1
12.	I am good at understanding what my baby wants	4	3	2	1
13.	I am good at keeping my baby occupied	4	3	2	1
14.	I am good at knowing what activities my baby does not enjoy	4	3	2	1
15.	I believe my baby responds well to me	4	3	2	1
16.	I believe that my baby and I have a good interaction with each other	4	3	2	1
17.	I can show affection to my baby	4	3	2	1

## Appendix 4a

### Functional Perinatal Infant Care Social Support Scale ©Leahy-Warren 2007

[Instructions] The following statements ask about the professional or family Support you believe you are getting now that your baby is born (Hospital/Home). After reading each statement, please completely fill in the circle, which you feel most closely, describes your experience. Because these are statements about beliefs, there is no right or wrong answers. Please CIRCLE your answer for all 16 questions below.

4= Strongly Agree; 3= Agree; 2=Disagree; 1= Strongly disagree

S. No.	Questions	Strongly Agree	Agree	Disagree	Strongly Disagree
1.	I get information on infant:				
	a. feeding	4	3	2	1
	b. changing/dressing	4	3	2	1
	c. comfort/settling	4	3	2	1
	d. bathing	4	3	2	1
2.	I get information on taking care of my body after childbirth	4	3	2	1
3.	I learn from other mothers' experiences	4	3	2	1
4.	I get consistent information regarding infant care	4	3	2	1
5.	I get hands on help with infant:				
	a. feeding	4	3	2	1
	b. changing/dressing	4	3	2	1
	c. comfort/settling	4	3	2	1
	d. bathing	4	3	2	1
6.	I have someone to help me with routine housework	4	3	2	1
7.	I am not on my own in taking care of the baby	4	3	2	1
8.	I have time for myself	4	3	2	1
9.	I have people to count on when things go wrong	4	3	2	1
10.	I have someone to care and comfort me	4	3	2	1
11.	I have someone to talk to about the way I am feeling	4	3	2	1
12.	If I need advice there is someone who will assist me to work out a plan for dealing with the situation	4	3	2	1
13.	I have people to talk to and share my experiences with	4	3	2	1
14.	I am shown appreciation for the care I give my baby	4	3	2	1
15.	People close to me understand that it is okay for me to need help	4	3	2	1
16.	I get positive feedback from professionals about the care I give my baby	4	3	2	1

## Appendix 4b

### Modified Structural Perinatal Infant Care Social Support Scale (S-SSMS)

*©Leahy-Warren 2005*

[Instructions] From the following list of people, please indicate by a tick (✓) the persons who are supportive and helpful to you in caring for your baby at this time. If any of the people below are not applicable or relevant please leave blank (tick more than one person as necessary)

Support provided	Husband/ Partner	Parents	Parents-in-law	Siblings	Friends	Neighbor	Nurse/ Midwife	Doctor	Others, Please specify
1. Provide information about caring for my baby (e.g. feeding, changing, bathing and settling your baby)									
2. Carry out infant care tasks (e.g. feeding, changing, bathing and settling your baby)									
3. Show that they care, love and respect me since I had baby									
4. Praise me for doing a good job in caring for my baby									

## Appendix 5

### Background Information of Mothers (Phase I)

[Instruction] Please tick your answer or fill in the blanks for the following questions.  
All information collected will be kept confidential.

1. Age: \_\_\_\_\_ (Years)
  
2. Ethnicity:  
(1) Chinese    (2) Malay    (3) Indian    (4) Others: \_\_\_\_\_
  
3. Marital status:  
(1) Married    (2) Single    (3) Others: \_\_\_\_\_
  
4. Highest education level:  
(1) Primary school  
(2) Secondary school  
(3) ITE/Polytechnic/Junior College  
(4) University
  
5. Occupation (if applicable): \_\_\_\_\_
  
6. Monthly household income:  
  
1) <\$1000  
2) \$1000-\$3000  
3) \$3000-\$5000  
4) >\$5000
  
7. Did you attend any prenatal courses?  
  
(1) Yes, in total how many hours? \_\_\_\_\_  
(2) No, reason: \_\_\_\_\_
  
8. Type of birth  
  
(1) Normal Vaginal Delivery (For example water birth),  
(2) Assisted Delivery (Vacuum/ Forceps), Please  
(3) LSCS (Emergency/Elective), Please
  
9. Is this your first delivery?  
  
(1) Yes                      (2) No



## Appendix 6

### Consent Form (Phase I)

**Protocol Title:**

A questionnaire validation and survey of maternal self-efficacy and social support in Singapore

**Principal Investigator & Contact Details:**

Dr. He Hong-Gu  
Assistant Professor  
Alice Lee Centre for Nursing Studies  
Yong Loo Lin School of Medicine  
National University of Singapore  
Level 2, Clinical Research Centre, Block MD11  
10 Medical Drive, Singapore 117597  
Tel: 6516 7448  
Fax: 6776 7135  
Email: nurhhg@nus.edu.sg

I voluntarily consent to take part in this research study. I have fully discussed and understood the purpose and procedures of this study. This study has been explained to me in a language that I understand. I have been given enough time to ask any questions that I have about the study, and all my questions have been answered to my satisfaction.

\_\_\_\_\_  
Name of Participant

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

*Witness Statement*

I, the undersigned, certify to the best of my knowledge that the participant signing this informed consent form had the study fully explained in a language understood by him / her and clearly understands the nature, risks and benefits of his / her participation in the study.

\_\_\_\_\_  
Name of Witness

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

*Investigator Statement*

I, the undersigned, certify that I explained the study to the participant and to the best of my knowledge the participant signing this informed consent form clearly understands the nature, risks and benefits of her participation in the study.

\_\_\_\_\_  
Name of Investigator /  
Person administering consent

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

## Appendix 7

### Ethics Approval (Phase I)

view

page 1 of 2



6 Commonwealth Lane  
Level 6 GMTI Building  
Singapore 149547  
Tel: 6496 8900 Fax: 64966370  
www.nhg.com.sg  
RCB No. 200002150H

**DSRB Ref: 2012/02226**

16 March 2012

Dr He Hong Gu  
Department of Alice Lee Centre for Nursing  
National University of Singapore

Dear Dr He

#### **NHG DOMAIN-SPECIFIC REVIEW BOARD (DSRB) APPROVAL**

**Project Title: A questionnaire survey of maternal self-efficacy and social support needs in Singapore**

We are pleased to inform you that the NHG Domain Specific Review Board has approved the above research project to be conducted in **National University Hospital**.

The documents reviewed are:

- a) Application Form: **Version No. 0**
- b) Participant Information Sheet and Consent Form: **Version dated 21/02/2012**
- c) Perceived Maternal Parental Self-Efficacy Instrument (PMP S-E)
- d) Structural Social Support Measuring Scale

The approval period is from **16 March 2012** to **15 March 2013**. The reference number for this study is **DSRB-2011/02226**. Please use this reference number for all future correspondence.

Continued approval is conditional upon your compliance with the following requirements:

1. Only the approved Participant Information Sheet and Consent Form should be used. It must be signed by each subject prior to initiation of any protocol procedures. In addition, each subject should be given a copy of the signed consent form.
2. No deviation from, or changes of the protocol should be implemented without documented approval from the NHG DSRB, except where necessary to eliminate apparent immediate hazard(s) to the study subjects, or when the change(s) involves only logistical or administrative aspects of the trial (e.g. change of monitor or telephone number).

[http://www.research.nhg.com.sg/sop/process/ROMP/Show\\_Email\\_Template?submissi...](http://www.research.nhg.com.sg/sop/process/ROMP/Show_Email_Template?submissi...) 3/16/2012

3. Any deviation from, or a change of, the protocol to eliminate an immediate hazard should be promptly reported to the NHG DSRB within seven calendar days.
4. Please submit the following to the NHG DSRB:
  - a. All unanticipated problems involving risk to subjects or others should be reported. In order to assist the DSRB, all reports should be accompanied by the NHG DSRB Unanticipated Problems Involving Risk to Subjects or Others Reporting Form. Please find all forms and guidelines on reporting on the internet at [www.research.nhg.com.sg](http://www.research.nhg.com.sg).
  - b. Report(s) on any new information that may adversely affect the safety of the subject or the conduct of the study.
  - c. NHG DSRB Project Status Report Form – this is to be submitted 4 to 6 weeks prior to expiry of the approval period. The study cannot continue beyond **15 March 2013** until approval is renewed by the NHG DSRB.
  - d. Study completion – this is to be submitted using the NHG DSRB Project Status Report Form within 4 to 6 weeks of study completion or termination.
5. The NHG Research QA Program was launched in May 2006. The program aims to promote responsible conduct of research in a research culture with high ethical standards, and to identify potential systemic weaknesses and make recommendations for continual improvement. This research project may be randomly selected for completion of self assessment worksheet or for a study review by the QA team. For more information please visit [www.research.nhg.com.sg](http://www.research.nhg.com.sg).

Yours sincerely,

A/Prof Low Yin Peng  
Chairman  
Domain Specific Review Board D  
National Healthcare Group

Cc: Institution Representative, NUH  
Department Representative, NUS

*(This is an electronic-generated letter. No signature is required.)*

## Appendix 8

### Participant Information Sheet (Phase I)

You are being invited to participate in a research study.

It is important to us that before you take part in this research study, the study must be explained to you and you must be given the chance to ask questions. Please read carefully the information provided here. If you agree to participate, please sign the informed consent form. You will be allowed to take home the copy of this document with you.

#### 1. Study Information

##### Protocol Title:

A questionnaire validation and survey of maternal self-efficacy and social support needs in Singapore

##### Principal Investigator & Contact Details:

Dr. He Hong-Gu  
Assistant Professor  
Alice Lee Centre for Nursing Studies  
Yong Loo Lin School of Medicine  
National University of Singapore  
Level 2, Clinical Research Centre, Block MD11  
10 Medical Drive, Singapore 117597  
Tel: 6516 7448  
Fax: 6776 7135  
Email: nurhhg@nus.edu.sg

##### Co-investigator & Contact Details:

Professor Sally Chan  
Professor and Head  
Alice Lee Centre for Nursing Studies  
Yong Loo Lin School of Medicine  
National University of Singapore  
Level 2, Clinical Research Centre, Block MD11  
10 Medical Drive, Singapore 117597  
Tel: 65163117  
Fax: 6776 7135  
Email: nurcwcs@nus.edu.sg

A/Professor Chong Yap Seng  
Associate Professor  
Department of Obstetrics and Gynecology  
National University Hospital and  
Yong Loo Lin School of Medicine,  
National University of Singapore  
Level 2, Clinical Research Centre, Block MD11  
10 Medical Drive, Singapore 117597  
Tel: 6772 4272 / 6516 5852

Email: obgcys@nus.edu.sg

**Ms. Shefaly Shorey**

PhD Student

Alice Lee Centre for Nursing Studies

Yong Loo Lin School of Medicine

National University of Singapore

Level 2, Clinical Research Centre, Block MD11

10 Medical Drive, Singapore 117597

Tel: 94794955

Email: a0090479@nus.edu.sg

## 2. Purpose of the Research Study

You are invited to participate in a research study that aims to examine maternal self-efficacy in newborn care and social support needs after childbirth in Singapore. Based on results of this study the interventions can be planned to enhance maternal confidence and social support needs of mothers post delivery. The maternal physical and mental health can then be improved which in turn has a profound effect on newborn development and maternal overall well-being.

You are invited in this study because you are:

- 21-45 years old
- post-delivery (Normal, Caesarean or Assisted )mothers
- able to read and write in English

You should not be participating in this study if you have :

- delivered a baby with apparent congenital anomalies or delivered stillbirth
- baby who has not admitted to the postnatal ward with you.

This study will recruit approximately 200 mothers from National University Hospital (NUH) over a period of 4 months, from 1<sup>st</sup> March 2012 to 30<sup>th</sup> June2012.

## 3. What procedures will be followed in this study

If you are willing to participate in this study, Questionnaire survey will be given to you to fill up. You will be approached at your bedside on the day of discharge. By our co-investigator. The Questionnaire survey will take approximately 30 minutes to fill up. It is intended as an opportunity for you to express your views on your confidence level in newborn care and the social support needs after childbirth. You need also to inform us of your background data such as age, ethnicity, and nationality.

## 4. Your Responsibilities in This Study

If you agree to participate in this study, you should be prepared to fill in the Questionnaire survey as instructed in the procedures above.

## 5. Withdraw from the study

You are free to withdraw your consent and discontinue your participation at any time without prejudice to you or any compromise in your care. If you decide to stop taking part in this study, you should tell the Principal Investigator.

## 6. Possible Risks and Side Effects

There is no risk or any discomforts for you to participate in this study. The only inconvenience will be the time spent for filling in a questionnaire survey.

## 7. Possible Benefits from Participating in the Study

There is no assurance that you will benefit from participation in this study. However, your participation in this study will increase your awareness of confidence level in newborn care and support needs after childbirth. The outcome of the study will provide baseline data for future intervention studies relating to postnatal support programs, for the enhancement of current practices to promote positive postnatal experience for women who deliver in Singapore.

## 8. Costs & Payments if Participating in the Study

There will be no payment or reimbursement involved with your participation in the study.

## 9. Subject's Rights

Your participation in this study is voluntary. You may stop participating in this study at any time. Your questions will be answered up to your satisfaction.

In the event of any new information becoming available that may be relevant to your willingness to continue in this study, the Principal Investigator or his/her representative will inform you in a timely manner.

## 10. Compensation for Injury

By signing this consent form, you will not waive any of your legal rights or release the parties involved in this study from liability for negligence.

## 11. Confidentiality of Study and Medical Records

Information collected for this study will be kept confidential. Your records, to the extent of the applicable laws and regulations, will not be made publicly available. All the data will be stored in a locked cupboard and authorized-access only computer in the Alice Lee Centre of Nursing Studies office. Only the principal investigator and co-investigators will be able to access the data and the research team could access the data set through the principal investigator.

However, the National University Health System (NUHS), National Healthcare Group (NHG) Domain-Specific Review Board and the Ministry of Health will be granted direct access to your original medical records to check study procedures and data, without making any of your information public. With consent, you (or your legally acceptable representative, if relevant) are authorizing such access to your study.

Data collected and entered into the Case Report Forms are the property of Alice Lee Centre for Nursing Studies, Yong Loo Lin School of Medicine, National University of Singapore (NUS). In the event of any publication regarding this study, your identity will remain confidential.

## 12. Costs of participation

If you take part in this study there is absolutely no costs required nor payments upon your participation.

## 13. Research related injury and compensation

The Hospital does not make any provisions to compensate study subjects for research related injury. However, compensation may be considered on a case-by-case basis for unexpected injuries due to non-negligent causes.

By signing this consent form, you will not waive any of your legal rights or release the parties involved in this study from liability for negligence.

## 14. Who To Contact if You Have Questions

If you have questions about this research study, you may contact the Principal Investigator, Dr. He Hong-Gu, Alice Lee Centre for Nursing Studies, Yong Loo Lin School of Medicine, National University of Singapore, by phone at 6516 7448 or by email at nurhgg@nus.edu.sg or anyone in the team as mentioned previously.

The study has been reviewed by the NHG Domain Specific Review Board (the central ethics committee) for ethics approval.

If you want an independent opinion of your rights as a research subject you may contact the NHG Domain Specific Review Board Secretariat at 6471-3266 (830 am-530 pm).

If you have any complaints about this research study, you may contact the Principal Investigator or the NHG Domain Specific Review Board Secretariat.

## Appendix 9

### Content Validity Form for: Perceived Maternal Parental Self-Efficacy Scale and Perinatal infant care Social Support scales

These questionnaires aim to collect mothers' (both first-time and with one or more children) self-efficacy-Items 1-17 (based on Bandura's self-efficacy theory) and Functional social support- Items 1-16 as well as Structural social support -Items1-9 (Base on social exchange theory).

In order to establish the content validity, I would like to have your expert advice on the questionnaire. A copy of the instrument used in the study and the comment sheet are attached. After reading the questionnaire, please rate the relevancy of each item to the objectives of the study by using a 4-point rating scale:

- 4 = Very relevant
- 3 = Relevant
- 2 = Somewhat relevant and needs modification
- 1 = Not relevant

Please also feel free to comment on the questions circle 1 or 2 with the space provided in the sheet. Please encircle on your opinion of the relevancy.



Perceived Maternal Parental Self-Efficacy instrument (PMP S-E)  
 ©Barnes & Adamson-Macedo (2007)

Instructions] The following statements ask to have your expert advice on this questionnaire. After reading the questionnaire, please rate the relevancy of each item to the objectives of the study by using a 4-point rating scale:

4= Very relevant; 3= Relevant; 2=Somewhat relevant; 1= Not relevant

S/No.	Questions	Very Relevant	Relevant	Somewhat Relevant & Need Modification	Not Relevant
1.	I am good at feeding my baby	4	3	2	1
2.	I am good at changing my baby	4	3	2	1
3.	I am good at bathing my baby	4	3	2	1
4.	I can make my baby happy	4	3	2	1
5.	I can make my baby calm when he/she cries	4	3	2	1
6.	I am good at soothing my baby when he/she becomes more restless	4	3	2	1
7.	I am good at getting my baby's attention	4	3	2	1
8.	I believe I can tell when my baby is tired and needs to sleep	4	3	2	1
9.	I believe I have control over my baby	4	3	2	1
10.	I can tell when my baby is sick	4	3	2	1
11.	I can read my baby's cues	4	3	2	1
12.	I am good at understanding what my baby wants	4	3	2	1
13.	I am good at keeping my baby occupied	4	3	2	1
14.	I am good at knowing what activities my baby does not enjoy	4	3	2	1
15.	I believe my baby responds well to me	4	3	2	1
16.	I believe that my baby and I have a good interaction with each other	4	3	2	1
17.	I can show affection to my baby	4	3	2	1

Functional Social support measuring scale ©Leahy-Warren 2007

Instructions] The following statements ask to have your expert advice on this questionnaire. After reading the questionnaire, please rate the relevancy of each item to the objectives of the study by using a 4-point rating scale:

4= Very relevant; 3= Relevant; 2=Somewhat relevant; 1= Not relevant

S. No.	Questions	Very Relevant	Relevant	Somewhat Relevant & Need Modification	Not Relevant
1.	I get information on infant:				
	a. feeding	4	3	2	1
	b. changing/dressing	4	3	2	1
	c. comfort/settling	4	3	2	1
	d. bathing	4	3	2	1
2.	I get information on taking care of my body after childbirth	4	3	2	1
3.	I learn from other mothers' experiences	4	3	2	1
4.	I get consistent information regarding infant care	4	3	2	1
5.	I get hands on help with infant:				
	a. feeding	4	3	2	1
	b. changing/dressing	4	3	2	1
	c. comfort/settling	4	3	2	1
	d. bathing	4	3	2	1
6.	I have someone to help me with routine housework	4	3	2	1
7.	I am not on my own in taking care of the baby	4	3	2	1
8.	I have time for myself	4	3	2	1
9.	I have people to count on when things go wrong	4	3	2	1
10.	I have someone to care and comfort me	4	3	2	1
11.	I have someone to talk to about the way I am feeling	4	3	2	1
12.	If I need advice there is someone who will assist me to work out a plan for dealing with the situation	4	3	2	1
13.	I have people to talk to and share my experiences with	4	3	2	1
14.	I am shown appreciation for the care I give my baby	4	3	2	1
15.	People close to me understand that it is okay for me to need help	4	3	2	1
16.	I get positive feedback from professionals about the care I give my baby	4	3	2	1

Structural Social support measuring scale ©Leahy-Warren 2007

Instructions] From the following list of people, please rate the relevancy of each item to the objectives of the study by using a 4-point rating scale:

4= Very relevant; 3= Relevant; 2=Somewhat relevant; 1= Not relevant

Support provided	Provide information about caring for my baby (e.g. feeding, changing, bathing and settling your baby)	Carry out infant care tasks (e.g. feeding, changing, bathing and settling your baby)	Show that they care, love and respect me in caring for my baby	Praise me for doing a good job in caring for my baby
(1) Husband/ Partner	4 = Very relevant 3 = Relevant 2 = Somewhat relevant and needs modification 1 = Not relevant	4 = Very relevant 3 = Relevant 2 =Somewhat relevant and needs modification 1 = Not relevant	4 = Very relevant 3 = Relevant 2 =Somewhat relevant and needs modification 1 = Not relevant	4 = Very relevant 3 = Relevant 2 =Somewhat relevant and needs modification 1 = Not relevant
(2) Parents	4 = Very relevant 3 = Relevant 2 = Somewhat relevant and needs modification 1 = Not relevant	4 = Very relevant 3 = Relevant 2 = Somewhat relevant and needs modification 1 = Not relevant	4 = Very relevant 3 = Relevant 2 = Somewhat relevant and needs modification 1 = Not relevant	4 = Very relevant 3 = Relevant 2 = Somewhat relevant and needs modification 1 = Not relevant
(3) Parents- in law	4 = Very relevant 3 = Relevant 2 = Somewhat relevant and needs modification 1 = Not relevant	4 = Very relevant 3 = Relevant 2 = Somewhat relevant and needs modification 1 = Not relevant	4 = Very relevant 3 = Relevant 2 = Somewhat relevant and needs modification 1 = Not relevant	4 = Very relevant 3 = Relevant 2 = Somewhat relevant and needs modification 1 = Not relevant

Support provided	Provide information about caring for my baby (e.g. feeding, changing, bathing and settling your baby)	Carry out infant care tasks (e.g. feeding, changing, bathing and settling your baby)	Show that they care, love and respect me in caring for my baby	Praise me for doing a good job in caring for my baby
(4) Siblings	4 = Very relevant 3 = Relevant 2 = Somewhat relevant and needs modification 1 = Not relevant	4 = Very relevant 3 = Relevant 2 = Somewhat relevant and needs modification 1 = Not relevant	4 = Very relevant 3 = Relevant 2 = Somewhat relevant and needs modification 1 = Not relevant	4 = Very relevant 3 = Relevant 2 = Somewhat relevant and needs modification 1 = Not relevant
(5) Friends	4 = Very relevant 3 = Relevant 2 = Somewhat relevant and needs modification 1 = Not relevant	4 = Very relevant 3 = Relevant 2 = Somewhat relevant and needs modification 1 = Not relevant	4 = Very relevant 3 = Relevant 2 = Somewhat relevant and needs modification 1 = Not relevant	4 = Very relevant 3 = Relevant 2 = Somewhat relevant and needs modification 1 = Not relevant
(6) Neighbor	4 = Very relevant 3 = Relevant 2 = Somewhat relevant and needs modification 1 = Not relevant	4 = Very relevant 3 = Relevant 2 = Somewhat relevant and needs modification 1 = Not relevant	4 = Very relevant 3 = Relevant 2 = Somewhat relevant and needs modification 1 = Not relevant	4 = Very relevant 3 = Relevant 2 = Somewhat relevant and needs modification 1 = Not relevant
(7) Nurse/ Midwife	4 = Very relevant 3 = Relevant 2 = Somewhat relevant and needs modification 1 = Not relevant	4 = Very relevant 3 = Relevant 2 = Somewhat relevant and needs modification 1 = Not relevant	4 = Very relevant 3 = Relevant 2 = Somewhat relevant and needs modification 1 = Not relevant	4 = Very relevant 3 = Relevant 2 = Somewhat relevant and needs modification 1 = Not relevant

Support provided	Provide information about caring for my baby (e.g. feeding, changing, bathing and settling your baby)	Carry out infant care tasks (e.g. feeding, changing, bathing and settling your baby)	Show that they care, love and respect me in caring for my baby	Praise me for doing a good job in caring for my baby
(8) Doctor	4 = Very relevant 3 = Relevant 2 = Somewhat relevant and needs modification 1 = Not relevant	4 = Very relevant 3 = Relevant 2 = Somewhat relevant and needs modification 1 = Not relevant	4 = Very relevant 3 = Relevant 2 = Somewhat relevant and needs modification 1 = Not relevant	4 = Very relevant 3 = Relevant 2 = Somewhat relevant and needs modification 1 = Not relevant
(9) Others	4 = Very relevant 3 = Relevant 2 = Somewhat relevant and needs modification 1 = Not relevant	4 = Very relevant 3 = Relevant 2 = Somewhat relevant and needs modification 1 = Not relevant	4 = Very relevant 3 = Relevant 2 = Somewhat relevant and needs modification 1 = Not relevant	4 = Very relevant 3 = Relevant 2 = Somewhat relevant and needs modification 1 = Not relevant

For Additional Comments

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Thank You

Appendix 10  
Comparison between Routine Care and Interventions

Time	Routine Care (Control Group)	Time	Interventions (Intervention Group Only)
At 2 weeks Post Delivery	Follow up with Obstetrician 1) Questioning & advice on: a) Breastfeeding b) Diet  2) Examination of Episiotomy wound or Caesarean wound  3) Wound dressing for Caesarean wound  4) Edinburgh Post Natal Depression Scale (EPDS)	Within 5-14 days Post Delivery	A Home Visit by Midwife  Postnatal Psychoeducation Programme (PPP):  1) Face to Face Health Education on the following topics:  a) Self-efficacy enhancing newborn care interventions b) Social support c) Postnatal Depression  2) Provision of Educational Booklet (especially prepared for the participants) covering above mentioned topics  3) Provide homework assignment of reading the book and writing a journal of weekly activities with baby.
At 6 weeks Post Delivery	Follow up with Obstetrician 1) Questioning & advice on: a) Breastfeeding b) Diet  2) PAP Smear  3) Intra Uterine Contraceptive Device (IUCD) if patient requests one  4) EPDS for those mothers who have defaulted the 2 weeks appointment	Within 2-6 weeks post Home Visit	Weekly Telephone Calls x 3  1) Discussion on contents of booklet or/and weekly journal 2) Reinforce important information covered during the home visit 3) Listen to mothers and find out about issues regarding newborn care 4) Provide education according to the individual needs of the mother

## Appendix 11 Outline for Postnatal Psychoeducation Programme (PPP)

### Background

The postnatal period extends from birth to 6-8 weeks post-delivery (until the woman's body returns to its pre-pregnant stage) (Ladewig, London, Moberly, & Olds, 2002). It is a stressful transitional period for women who face numerous physical, emotional and social challenges which are greater for the first time mothers as compared to multiparas (one or more children) (Bashour et al., 2008; Thompson, Roberts, Currie, & Ellwood 2002). This period is further complicated by the lack of support from healthcare professionals due to early hospital discharge (Kapp, 1998). Support available during the early postnatal period varies among countries. In Singapore, the only attention provided to the women after discharge is by follow-up hospital visits conducted by the doctors from 1-6 weeks postpartum, dependent upon maternal needs. However, according to the anecdotal evidence, these visits are not well utilized by the women, especially by the subsidised group. One of the crucial characteristics for transition to motherhood during this period is the maternal self-efficacy (Leahy-Warren, 2005). Self-efficacy is a cognitive process by which one is able to evaluate their ability towards the performance of a given task (Bandura, 1997) such as newborn care post-delivery. Literature supports that self-efficacy mediates the effect of social support and has an impact on postnatal depression (PND) which is one of the major health issues during the postnatal period (Haslam, Pakenham, & Smith, 2006). Adequate postnatal education and support in accordance with women's needs is essential to enable them to manage changes during the postnatal period and to promote maternal and newborn wellbeing (Ngai, Chan, & Holroyd, 2011; Persson, Fridlund, Kvist, & Dykes, 2011).

### Introduction

The Postnatal Psychoeducation Programme (PPP) is a home-based educational programme to facilitate smooth transition to motherhood. The programme includes psychoeducational interventions, based on Bandura's self-efficacy theory (1997), social support and knowledge on self-management of newborns (Smith et al., 2005).

According to literature, the self-efficacy theory and psychoeducation have been well researched to bring successful behavioural changes in various situations such as chronic care (Cheal & Climson, 2001) and fall prevention (Dijkstra & Wolde, 2005). The maternal health psychoeducation, especially antenatal childbirth education (Ngai, Chan, & Ip, 2009) using Bandura's self-efficacy theory (Ip, Tang, & Goggins, 2009) has also shown effectiveness in improving maternal coping with childbirth. However, the use of self-efficacy theory in postnatal education is inconclusive and has been recommended (Ngai, Chan & Ip, 2010; Nicholos, Nicola, Rhonda, Dennis & Price, 2009). Given the gaps in the studies applying psychoeducation during the postnatal period, an efficacy enhancing postnatal programme needs to be developed and evaluated.

Hence, the aim of this PPP is to enhance maternal self-efficacy in newborn care and help seeking behaviour (social support) as well as to decrease postnatal depression (PND). The PPP comprises a 90-minute interactive individualised session at women's home and three follow-up phone call sessions. It is designed as an adjunct to the routine postnatal supportive hospital visits. The education session will be reinforced with an education booklet given to the women as reference material. The booklet is developed based on the literature and a preliminary qualitative research exploring first-time mothers' postnatal experiences conducted in the participating hospital. The timing of the interventions includes home visits between 5-14 days post delivery followed by weekly phone calls. The home visits are planned within the first two weeks, as this is the most stressful period for the women who need the most help (Kapp, 1996). The target population for this programme is the multi-racial first time mothers residing in Singapore.

### Theoretical Framework

The programme is based on Bandura's self-efficacy theory. Haslam et al., (2006) has proven that self-efficacy mediates the relationship between social support and PND. In fact, social support helps in increasing maternal self-efficacy; PND on the other hand reduces maternal self-efficacy (Haslam, et al., 2006; Leahy-Warren, McCarthy, & Corcoran 2011; Ngai, Chan, & Ip, 2010). Consequently, the psychoeducation programme aims to focus on all three (self-efficacy, social support and PND)



interrelated components to educate first time mothers with maternal self-efficacy as a primary outcome as illustrated in Figure 1.

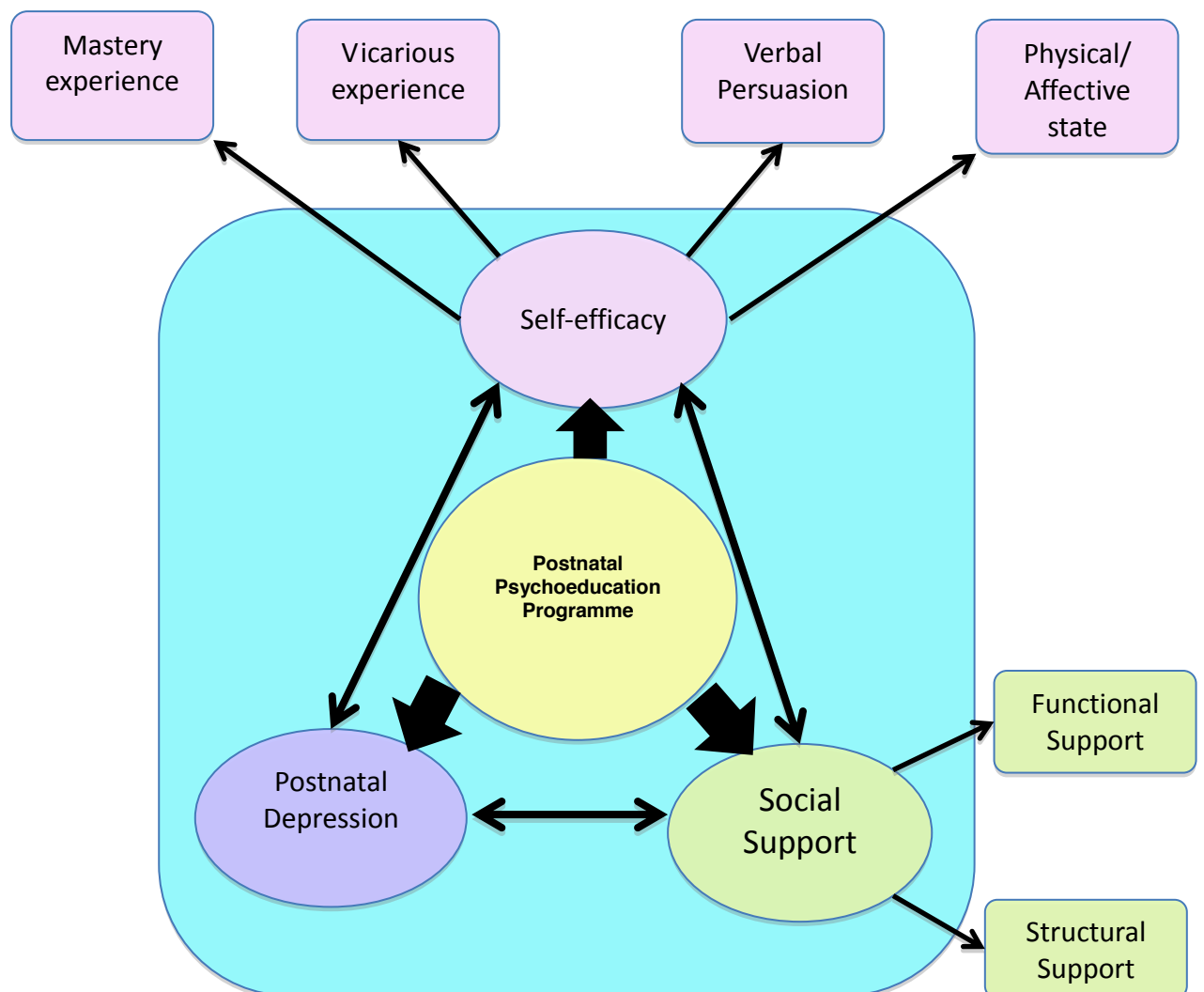
According to Bandura (1997), self-efficacy is a cognitive process by which one is able to evaluate their ability towards the performance of a given task. In essence, it is not only the knowledge but also the perceived confidence required in performing any task. There are four sources that influence an individual's self-efficacy in a given realm of life (Figure 1). First, the personal mastery experience, which provides confidence to repeat accomplishments in future such as confidence in newborn care. This is one of the important sources of efficacy information as it is based on personal experience. Second, vicarious experience which enhances an observer's confidence when they observe others successfully accomplishing a task. The potential for personal success enhances further especially when they observe others similar to themselves. Third, verbal persuasion involves verbal assurance by others that one can accomplish a task. Finally, the affective and physiological states of an individual provide the fourth source of efficacy information. Many researchers (Bandura, 1997; Cheal & Clemson, 2001) have endorsed that a combination of all the four sources which include health education, skills practice, role modeling and self-affirming verbal persuasion with a special focus on an individual's emotional well-being produce the best effect.

Social support plays an important role in facilitating the smooth transition to motherhood (Wilkins, 2006) and is much needed by the women especially in the first two weeks of post delivery (Bennett & Tandy, 1998; Kapp, 1998). Social support entails networking that enables people to cope with stressful events. House (1981) had defined social support as a combination of Functional and Structural support (Figure 1). Functional Support comprises emotional support (provision of love, care and empathy), instrumental support (provision of practical support such as household chores and newborn care), informational support (provision of knowledge such as breastfeeding advice) and appraisal support (Provision of constructive feedback and affirmation to enable self evaluation). Structural Support is further subdivided into formal support (by midwives and health professionals) and informal support (by significant others such as husbands). Functional and Structural support are equally important and needed by the mothers (Leahy-Warren, 2010). The lack of support

especially in terms of newborn care can cause undue stress for mothers which in-turn has profound effects on their functioning and psychological health making them more vulnerable to PND (Chan & Levy, 2004; Kapp, 1998).

In summary, maternal self-efficacy has been identified as a major determinant of competent parenting and newborn wellbeing, which in turn affects social support and PND. Hence, educating mothers through the psychoeducation programmes will not only enhance maternal self-efficacy in newborn care but also social support (help seeking behaviour) and decrease in PND.

Figure 1: Theoretical Framework



## Aim

The objectives of the postnatal psychoeducation programme are to:

- 1) educate mothers on maternal self-efficacy and ways to enhance it;
- 2) promote mothers' emotional well-being and reduce the risk of PND;
- 3) emphasize the importance of formal and informal social support and means of getting the social support;

Serial No.	Topics	Time- Period
1	Educational Booklet	Will be provided during the home visits
2	Psychoeducation session during home visits	Between 5-14 days post delivery
3	Individualised Telephone sessions x 3	Weekly basis after home visit session (week 3-5 post delivery)

## Outline of Postnatal Psychoeducation during home visits\*

Serial No.	Activities	Time	Facilitator
1	Explore stressors and challenges of postnatal period	15 minutes	Principle Investigator (PI)
2	Introduce PPP: <ul style="list-style-type: none"> <li>• Discussion on self-efficacy and social support</li> <li>• Discussion on Psychological challenges such as postnatal Blues and PND</li> </ul>	60 minutes	PI
5	Interactive session with mothers according to their individualised needs	15 minutes	PI

*\*An educational booklet will reinforce the face-to face postnatal psychoeducation programme contents.*

Details of the activities of Postnatal Psychoeducation Programme (PPP) are as follows:

### Activity1. Explore stressors and challenges of postnatal period:

A) Mothers will be asked to relate to their experience during the postnatal period after hospital discharge. This will provide opportunities for mothers to verbalize their concerns. This will also provide prospects to the researcher to know mothers and their challenges well. Based on this information available, the researcher will be able to plan and provide individualised education to the mothers towards the end of the session.

Some of the questions to be asked will be as follows:

- How is your experience so far with newborn care after the hospital discharge?
- Are there any challenges that you face during this period? If Yes, Please elaborate.
- How did you feel when you experienced those challenges? Was it stressful?
- What did you do during or after that stressful period?
- Did you seek help from others? If yes, who and what type of help?
- Would you like to share some of your thoughts regarding newborn care?

B) For mothers to understand and anticipate things better, they will be explained on common stressors during postnatal period. This will facilitate them to prepare for the challenges better. The discussion on the stressors (Brown & Lumley, 2000) will be as follows:

- Physiological challenges such as tiredness, perineal pain, breast problems, backache and constipation Psychological challenges such as mood swings, loneliness and boredom
- Learning and mastering mothering skills
- Disruption in routine activities
- Change in relationship dynamics between partners and other family members
- Financial burden

*Activity 2. Introduce Psychoeducation Programme: Discussion on Self-efficacy and Social support and Psychological needs and well-being*

C) The researcher will share the importance of self-efficacy and social support to the mothers as follows:

The meaning of self-efficacy and factors affecting self-efficacy will be elaborated with examples as shown below:

- Mastery experience: This can be attained only after practicing and accomplishing the skills. For example, Baby bathing. It is important to do things yourself and learn from your mistakes.

- Vicarious experience: If you are not confident to do things right the first time round, ask for help. Ask family members, friends or contact health professionals to clear your doubts. Seeing others performing a task will raise your confidence.
- Verbal Persuasion: Asking for feedback from others on your task performance such as putting the baby to sleep. This will help you to improve your skills, which, in turn will raise your confidence. You can ask feedback from your husbands, mothers, friends or health care professionals.
- Physical/Affective state: Your physical and emotional well-being can have profound effects on your confidence in looking after your newborn. Therefore, it is important for you to take adequate rest, painkillers on time (if required), seek help, speak to others about your concerns and be aware of your well-being.

D) Mothers will be reinforced to be patient and stay calm. Some of the ways to enhance confidence in newborn care will be discussed as follows:

- To have realistic expectations for maternal role
- Focus on personal strengths and stop having negative thoughts
- Be patient and allow time to learn about your baby and for your newborn to know you
- Reward yourself after achieving small accomplishments in baby care
- Read the information provided to you in newborn care
- Learn from others
- Take ample rest

E) Importance of Social Support will be elaborated as follows:

Support needs are increased after the birth of a baby. These can be categorized in two groups: the increased practical workload and an increased need to confide your feelings and experiences. Both formal support (from health care professionals) and informal support (family and friends) is important during the early days after hospital

discharge. The social support provides a sense of belonging, self-worth and feeling of security.

Furthermore, the sources and ways to get social support will be highlighted:

- People near you: your partners, your parents, other family members and your friends
- For practical help: Nannies, Domestic helper, Parents, partners, other family members and friends
- For Emotional help: Partner, friends (both old and new-having small children), professional contact person (call back hospital hotline, contact your consultant or emotional support helpline)
- Involve baby's father in care and negotiate the daily tasks to be done by him such as night feeding, changing of diapers or baby bathing. This will strengthen the bond between fathers and newborn and you will have some time to take rest as well
- Ask specifically the kind of help you need. For example, if you need help in household cleaning and not in baby care, say it out clearly

In order to gain self-efficacy, the researcher will emphasize the need for new mothers to practice newborn care. The information provided will be further reinforced via the educational booklet provided to the mothers.

F) Psychological challenges will be elaborated to the mothers as follows:

The prevalence and reasons of baby blues will be explained to the mothers. Strategies of coping with the low mood and when to seek medical attention will be emphasised.

The prevalence and causes of PND will be provided to mothers. The list of symptoms on PND will be shared as follows:

- Loss of interest in routine work
- Loss of self- esteem and confidence

- Change in appetite
- Difficulty in sleeping (irrespective of the baby's routine)
- Sense of hopelessness and feelings of being a failure
- Wishing not to live
- Suicidal thoughts
- Panic attacks
- Fears for the baby's or partners' safety or well-being
- Mood fluctuations: tearfulness, anxiety, sadness and irritability
- Reduced concentration and decision making ability

G) Ways to enhance positive thinking will be emphasised as below:

- Writing down your thoughts into a weekly journal (See page 36).
- Stopping negative thoughts immediately as they come to your mind by saying out loud "Stop". Reason of saying this aloud is to make you more aware of how many times you are stopping the negative thoughts.
- Replacing negative statements with affirmations such as
- I can accomplish anything
- I can handle whatever comes to me
- I am strong
- I can create inner piece
- This too shall pass
- Stress is leaving my body
- Today I choose to be happy
- I am doing my best
- I will ask for help when I need

*Activity 3: Interactive session with mothers to answer their queries:*

- The researcher will go through the contents on newborn care by referring to the education booklet



- Mothers queries will be answered
- Demonstration on any aspect of newborn care according to mother's needs will be shown
- Return demonstrations (if applicable) will be encouraged so that mothers can be corrected on their mistakes
- Constructive feedback on mother's overall achievement of newborn care will be provided

At the end of the three activities, main points will be summarized and highlighted to the mothers. They will be given handouts (homework assignments) to keep their weekly journals, which will be discussed during the telephone sessions on a weekly basis. The date and time for the first telephone session will be determined

## Homework Assignment: Weekly Journal for Mothers

1. Please fill in the journal.

- Track your weekly activities especially stressful one, by answering the questions given below. This will enable you to understand the challenges you are facing so that you can cope with them better
- You may find some of the answers from the booklet so please remember to read it.
- Fill in your answers in the space provided as and when you find time. Make sure you are ready with your answers before the phone call session the next week.

Questions	Answers
What was the most stressful event in the past week?	
(1) How did you feel both physically and emotionally?	
(2) How did you act in response?	
(3) What did you do to make yourself feel better?	
(4) What will you do if you face similar challenges in the future?	

## Contents of Education Booklet

The booklet would be prepared based on previous literature, maternal needs discovered during the interviews done on local mothers (A Pilot Study) and Self-efficacy theory. The main contents of the booklet would include information on:

- ❖ Self-efficacy enhancing newborn care interventions
  - ❖ How to soothe a crying baby
  - ❖ Baby Sleep patterns
  - ❖ Breast feeding related issues
  - ❖ Baby Behaviour
  - ❖ Baby Bathing
  - ❖ Jaundice
- ❖ Help seeking behaviour (social support)
  - ❖ Importance of both formal and informal social support
- ❖ Post-Natal Depression (PND)
  - Ways to enhance positive thinking
  - Rational and irrational thoughts
  - Ways to control irrational thoughts
- ❖ Maternal Self-Care
  - ❖ Wound Care
  - ❖ Postnatal Bleeding
  - ❖ Kegel Exercise
  - ❖ Tiredness & Fatigue

## Appendix 12

### Postnatal Psychoeducation Programme (PPP) Educational Booklet for First-Time Mothers



# **Postnatal Psychoeducation Programme (PPP) Educational Booklet for First-Time Mothers**

Shefaly Shorey  
Sally Wai-Chi Chan  
Yap Seng Chong  
Hong –Gu He



# Educational Booklet for First-Time Mothers



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## *Introduction*

### ***Congratulations on the birth of your baby!***

While having a baby is an exciting moment, it is understandable that after the birth of your newborn you may feel a range of different emotions. This booklet aims to ease some of your concerns, assist you in coping with your physical and emotional challenges and prepares you for your new role as a parent. It provides information relevant for newborn care at home. It is, however, only a guide as each woman and their newborn may require different information and care depending on their circumstances.

This booklet is part of an intervention for the Postnatal Psychoeducation Programme (PPP). The content of this booklet provides information in addition to what has been taught to you during the home visit. This booklet does not replace the advice from your obstetrician and the midwife. Hence, please do not hesitate to call the hospital helpline or bring your baby to the nearest doctor if there are any concerns or doubts.

We encourage you to read this booklet as soon as you can after the home visit by the midwife. If you are unable to read this booklet on your own for some reason, we encourage fathers to read this booklet to the mothers. This will not only improve the father's knowledge on newborn care tasks but also enhance the relationship between the couple.

## Contributors to this Book

This book is dedicated to the expert advice provided by my supervisors Prof Sally Chan and Dr He Hong- Gu and the support from my clinical supervisor Prof Chong Yap Seng.

It would not have been possible to compile this book without the insights provided by the first-time mothers who had delivered their babies at the National University Hospital.

## Chapter 1

### Physical Challenges after Birth

Having a baby is a wonderful moment. The period following the birth of your child (postnatal period) is crucial for both you and your baby. Mothers undergo many physical challenges and new adjustments are made during this period. It will take some time for your body to gradually return to its pre-pregnant state. It can take from weeks to several months and you will experience the following:

#### 1. Bleeding



You will have some bleeding, which is also known as 'lochia' in the first few weeks of post delivery. It will be heavy in the beginning and will decrease gradually. The color of the bleeding will be red, subsequently turning to reddish-brown, and then finally after about 2 weeks; the bleeding will become a clear discharge. The bleeding normally lasts for about 3-4 weeks and you may experience heavy bleeding during the early stages of breastfeeding. This is due to the contraction of the uterus.

If you suddenly have more bleeding (pad fully soaked within an hour), please get medical attention at the hospital. Also, if your bleeding persists after six weeks, please inform the doctor during the follow-up hospital visits.

As such, if the lochia takes time to clear, your doctor might prescribe you with some iron tablets to prevent anemia, which tends to cause excessive tiredness.

## 2. Fatigue



The most common problem faced by every new mother post delivery is fatigue. Interrupted sleep, frequent breastfeeding, anxiety about caring for the well-being of the baby, hurried meals and taking care of the baby alone can lead to extreme tiredness. This may further affect the bonding with your baby and could also lead to straining the relationship with your partner.

Please do ask for help when you need one, especially when taking care of your newborn. It is essential that you have adequate rest not only for your recovery but also to maintain the breastfeeding supply.



In order to avoid excessive tiredness you can do the following:

- Make time each day to have rest to compensate for the loss of sleep each night.
- Feed the baby in a lying down position so that you can also rest.
- Try to make night feeds quicker by avoiding changing the diaper with each feed unless it is absolutely necessary. This will enable you to avoid the overstimulation of the baby at night.
- Try to limit visitors to a particular time of the day. This will allow you to have quality time for yourself and your baby.

- Delegate household activities as well as the baby care tasks with the family members especially your husband. This will allow him to have better bonding with the baby.
- Consume a well balanced diet.

### 3. Diet



Consume an adequate and well balanced diet. You continuously need to eat healthily after the birth of your baby just as it was when you were pregnant. Your body needs nourishment from a variety of food to help you recover from childbirth.



The following are some important information related to your diet:

- 🍏 Eat everything in moderation. You may become hungrier when you are breastfeeding and you may then need to satisfy your appetite with a healthy variety of food.
- 🍏 Try foods that are calcium and protein rich such as milk, eggs, pulses, fish, fruits, vegetables, whole grain breads, cereals and other such food, which suits your cultural beliefs.
- 🍏 Thirst is also increased when you are breastfeeding, which is best satisfied by drinking lots of water. Avoid taking soft drinks.
- 🍏 There is no scientific proof that use of ginger in your diet will cause jaundice to the babies.
- 🍏 It is important not to skip meals. There is no particular food, which has been proven to upset babies or cause

wind. The natural variation in your diet will change the flavor of the breast milk for your baby, which may better prepare your baby for solids after six months of age.

- 🍏 It is recommended that you minimize the use of caffeine and alcohol while breastfeeding as they can pass through breast milk and make the baby irritable. However, if you have to take caffeine or alcohol such as alcohol in the local health tonics such as “Dome” it is advisable to wait for two to three hours after consumption before breastfeeding your baby. It is also advised that you do not exceed more than two drinks per day.

#### 4. Pain Management



You may require regular pain relief after the birth of your baby especially when you breastfeed. This is due to the contraction of the uterus and is known as “afterbirth pains”. In the first few days, these contractions can be unpleasant and difficult to cope with. The pain tends to be less severe with each passing day.



You can try the following to relieve your pain:

- 🧩 Deep breathing exercises
- 🧩 Relaxation
- 🧩 Use of hot compress such as hot water bottle to relieve the pain

- ✚ If the above pain relieving methods do not help, use of painkillers such as Panadol (Paracetamol) given to you by the doctor is recommended. The medicine taken about an hour before a feed in the first few days after delivery can help to relieve pain.

➤ **Please Remember:**

- **Please note that painkillers given to you by the doctor in the hospital are safe to consume during breastfeeding.**

## 5. Perineal Care

The perineum is the area of skin and muscle between the vagina and anus as shown in figure 1. If you have had some form of perineal or vaginal tearing, or an episiotomy (a cut made into your perineum to enlarge your vaginal opening), the following recommendations will assist to ease the discomfort until stitches have healed.



These recommendations are:

- ◆ Keep the area clean and dry.
- ◆ Change the pad frequently at least every 4 hourly to prevent infection.
- ◆ During the first few times of bowel opening, support the perineum with a pad, which will protect the stitched area.
- ◆ Sitting in a warm tub of water from time to time is soothing.
- ◆ Lie on your side to feed the baby and avoid sitting cross-legged or in any position that makes your genitalia gape.
- ◆ Do pelvic floor exercises (Kegal exercise) as early as you can. Ask the midwife if you are not sure how to perform the kegal exercise. The exercise will promote healing and strengthen the pelvic floor muscles.



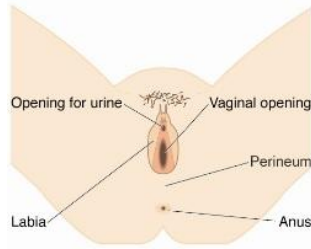


Figure 1

➤ **Please Remember:**

- **If you have stitches, they are dissolvable and will fall out between one to three weeks after birth. You may find some stitches on your toilet paper or in the shower.**

## 6. Bladder

You may have to pass urine every 3-4 hourly in the first few days post delivery as the body is getting rid of excessive fluids. If you have stitches, passing urine may sting.



You may try doing the following:

- Passing urine while taking shower.
- Leaning forward on the toilet bowl while passing urine as shown in figure 2.
- Tipping warm water over your perineum as you sit on the toilet bowl.
- Drinking water dilutes your urine, which may also help.



Figure 2

## 7. Bowel

It is normal not to open your bowels for a few days after birth. Your bowel motions need to remain soft and easy to pass to allow stretched muscles and a stitched perineum to heal quickly. It is thus important to eat fresh fruit, brown bread and whole grain cereals and to drink plenty of water.

Your doctor may provide you with the stool softener, which is safe to consume during breastfeeding.



You may try doing the following:

- Use the lean forward position when sitting on the toilet bowl (figure 2).
- Use a clean pad to gently support your stitches.
- Do not strain, just relax and take your time. This remains important for at least six weeks after birth while the affected tissues heal properly.
- Consult your doctor if you have a history of chronic constipation or hemorrhoids (piles). The doctor will prescribe you with some medication to ease your discomfort.

## 8. Exercise

You should start the pelvic floor exercise (kegal) as early as you feel comfortable after the delivery.



You need to take note of the following:

- 👉 Always maintain a good posture while sitting with a good back support keeping your back straight.
- 👉 You should always get in and out of bed on your side, as this reduces the strain on your perineum, back and tummy (See figure 3).
- 👉 Always start with short sessions of exercise as soon as your body feels right, and then increasing gradually.
- 👉 If the exercise hurts or strains your tummy or perineum, stop what you are doing; this may not be good for you.

- 👉 Try to do social activities such as yoga, walking, swimming and Pilates rather than competitive team supports.



Figure 3

## 9. Sex and Contraception

Sexual relations can resume when episiotomy wound has healed; there is no active bleeding and when you feel comfortable unless advised otherwise by your doctor.

If you are exclusively breastfeeding (no formula or mixed feeding), you may not ovulate for up to six months post delivery. This is commonly used as a method of contraception but it is not fully reliable especially if your period was not regular before pregnancy.

If you have chosen not to do exclusive breastfeeding such as mixed feeding, ovulation may occur before you have your period and therefore it is possible that you can get pregnant anytime after you resume intercourse. Your first period may start as early as one month after birth or up to 12 weeks.

## 10. Additional Instructions for Caesarean Mothers

- **Please Remember to:**
  - **Discuss the options of family planning during the follow-up hospital visit with your doctor.**



### 10.1 Pain Management:

You will be given Panadol or stronger painkillers to go home with. These medicines are safe to consume and should be taken at least one hour before breastfeeding.

If your method of pain relief is not effective, do not suffer in silence speak to a doctor. Remember that you are the only person who really knows about your pain and what works best for you. Therefore, we encourage you to speak up before your pain becomes severe because it will affect your ability in self and baby care.

### 10.2 Wound Care:

Your wound dressing will remain for five to seven days and might be removed before you go home. If not removed, your doctor will inform you when to come back to the hospital to get it removed. You are advised to keep your operation site dry at all times.

### 10.3 Exercise:

After the discharge, you will be spending more time than usual, resting and recovering in bed. It is important to slowly and gently get your muscles working again. A very gentle and regular program of stretches and exercises will help you recover faster. However, be careful when getting in and out of bed as shown in the figure 3.



Remember to do the following:

- ➔ Begin kegal exercises as early as you can.
- ➔ Do not engage in strenuous activities such as lifting of heavy objects for about two months post caesarean.

- Always support your operation site while coughing or getting out of bed.
- You may consider wearing an abdominal binder to support your wound as shown in figure 4.



Figure 4

## 11. When to Seek Medical Attention



It is important to seek medical attention as soon as possible if:

- 📌 You have increased blood loss, with or without clots.
- 📌 Your blood loss starts to smell.
- 📌 You experience high temperatures.
- 📌 You have increasing pain.
- 📌 You find a red, hard, hot area on your breast that does not clear with breastfeeding, with or without flu-like symptoms such as aches, pains and shivers.
- 📌 You have difficulty passing urine or a bowel motion.
- 📌 You have increased tenderness or swelling of the perineum.
- 📌 Your abdominal wound is oozing fluid, or the skin is red or hot to touch (caesarean sections).

### ➤ **Please Remember:**

- **If you are concerned in anyway about yourself or your baby you should seek medical attention.**

## Chapter 2

### Psychological Challenges after Birth

#### 1. Postnatal Feelings

The postnatal period is a time to celebrate the arrival of your new bundle of joy. However, this is also the time when mothers undergo lots of emotional challenges. Research has shown that this is the period when women are most likely to be depressed. The following below will provide you with information on how you can face and cope with such emotional challenges:

#### 1.1 Baby Blues



Approximately 80 per cent of women experience baby blues after three days post delivery. Baby blues can be caused by hormonal changes, tiredness, pain from stitches, a wound, full breasts or even feeling flat after all the excitement of the birth. You may feel anxious about small things and become very weepy. These feelings are usually temporary, tends to last for a few days to a week or two and you will feel better as the body returns to the normal hormonal levels.



You can do the following to feel much better:

- ♥ A good cry often helps.

- ♥ Talk to your husband, friends or other family members about your feelings.
- ♥ Take some rest. Sometimes a good sleep is all that you need.

➤ **Please Remember:**

- **If your feelings of low mood last more than two weeks, you could be suffering from postnatal depression and you should see the doctor immediately.**

## 1.2 Postnatal Depression



About 10 to 20 per cent of women can go on to develop postnatal depression, which may include one or more of the following signs or symptoms:

- ✿ Persistent low mood.
- ✿ Less interest in usual work.
- ✿ Extreme anxiety, confusion and panic.
- ✿ Low self-esteem and confidence.
- ✿ Difficulties in sleeping or excessive sleeping.
- ✿ Not eating or overeating.
- ✿ Inability to enjoy anything or cope with routine tasks.
- ✿ Inability to think clearly or make decisions.
- ✿ Feelings of wanting to harm the baby or self (suicidal thoughts).
- ✿ Fearing for the babies or partners' safety or well-being.
- ✿ Wanting to run away.

Postnatal depression can occur as early as a few weeks or months after delivery. You are also at risk of having postnatal depression anytime within the first year of post delivery. It can be mild and may be overcome with time. In the event of severe depression, professional help from doctors might be needed.



The following can help you to manage your feelings better:

- ♥ Calling a friend.
- ♥ If someone else can take care of the baby, take a quick break.
- ♥ Practicing deep breathing exercise and make a conscious effort to relax and calm down.
- ♥ Accepting your tiredness or low mood instead of self-blaming.
- ♥ Crying or shouting out sometimes help.
- ♥ Increasing activities such as watching TV or having a quick nap.
- ♥ Setting realistic expectations such as prioritizing baby care over household chores.
- ♥ Time management, e.g. balancing between newborn care, household activities and resting time.
- ♥ Self-talk to reduce negative thoughts.
- ♥ Getting a massage.
- ♥ Writing your thoughts in a journal (See page 58 for the Template of Stress Journal)

➤ **Please Remember:**

- **Postnatal depression is a treatable condition and it is most important to get help early.**
- **You can seek help through your doctor or by contacting the hospital helpline (See contact details at page 35).**



### 1.3 Rational and Irrational thoughts

Some mothers may start to feel the uncontrollable irrational thoughts that can disrupt their baby care abilities as well as their relationship with their partner and family members. It is important that you are able to differentiate between the rational and irrational thoughts as shown in table 1

Table 1 Difference between rational and irrational thoughts

<b>Rational thoughts</b>	<b>Irrational thoughts</b>
Honest, appropriate concern and accurate perception of reality.	Inappropriate and excessive concerns. Inaccurate perception of reality.
Objective and reasonable.	Subjective and unreasonable.
Help to define realistic goals.	Unable to define realistic goals and strive for perfection.
Focus on problem solving and draw correct solutions.	Focus exclusively on self-deprecating thoughts.
Prevent unnecessary internal/external conflicts and reduce stress level.	Create internal/external conflicts, and increase stress level.

Types of Irrational thoughts are as follows:

- **All or Nothing Thinking:** You see everything in terms of black or white with no shades of gray. If something is not perfect, it is not acceptable. Create unduly high expectations on oneself, others and the environment that can lead to a feeling of guilt, anger and frustration.  
Example: “I should know all the needs of my baby”.

- **Overgeneralization:** You take a single negative event as evidence that things are all bad or are always going to be bad.

Example: “I cannot soothe my crying baby. I can never be a good mother.”

- **Disqualifying the Positive:** In a situation or event, there are usually some positive and negative aspects. You discount or ignore the positive aspects and instead focus on the negative aspects of the event, even when the situation or event was largely positive.

Example: You are doing a good job in burping your baby well after each feed. However, a single episode of vomiting by the baby led you to conclude, “I don’t know how to burp the baby”.

- **Jumping to Conclusion:** You arbitrarily jump to negative conclusions that are not supported by facts. This may involve mind reading, making assumptions about what other people are thinking, or predicting negative future events without evidence.

Example: My husband and his mother are whispering in the kitchen. They must be talking about me.”



You can control your irrational thoughts by trying the following methods:

- ♥ Writing down your thoughts onto a stress journal (See page 58).
- ♥ Stopping negative thoughts immediately as they come to your mind by saying out loud “Stop”. Reason of saying this aloud is to make you more aware of how many times you are stopping the negative thoughts.

♥ Replacing negative statements with affirmations such as:

- ➡ I can accomplish anything.
- ➡ I can handle whatever comes to me.
- ➡ I am strong.
- ➡ I can create inner piece.
- ➡ This too shall pass.
- ➡ Stress is leaving my body.
- ➡ Today I choose to be happy.
- ➡ I am doing my best.
- ➡ I will ask for help when I need.

♥ Challenging irrational thinking by asking yourself the following questions:

- ➡ Does everyone in my position have the same thoughts as I?
- ➡ How might I be exaggerating my thoughts and feelings?
- ➡ In this situation, is there no remedy at all?
- ➡ In this situation, what will be the worst consequence?
- ➡ What specific thoughts do I need to think to myself to reduce and cope with excessive feelings I have?
- ➡ What advantages will these new thoughts bring to me?

## 2. When to Seek Medical Attention



It is important to seek medical attention as soon as possible:

- ♥ When you have consistent low mood for more than two weeks.
- ♥ If you have any kind of negative thoughts such as harming the baby or your own self.

➤ **Please Remember:**

- **Don't be so harsh on yourself and take one thing at a time. If you have certain feelings that you feel are not appropriate, give yourself sometime. Try out the above-mentioned advice and you might feel better with time.**
- **Despite of all your efforts if your feelings still persist, never suffer in silo, "SEEK HELP EARLY".**

## Chapter 3

### Newborn Care Challenges



Caring well for a baby requires skills, knowledge and time. We learn from our own experiences of being cared for during childhood, watching other people care for their children, learning from our loved ones and health professionals, reading from books and the Internet.

The following information will help you to understand your baby's needs better and to provide your baby a healthy start to his life:

#### 1. Umbilical Cord Care

Keep your baby's cord dry and clean at all times. You can use boiled water, which has been cooled, and a cotton wool or bud to clean it from base upwards as shown in figure 5. You can choose to clean the cord each time after baby bathing or when it gets wet. The cord will feel cold and jelly like initially, and will then become dry and brown in color.



Figure 5



It is advisable to take note of the following:

- 🌀 Check the cord at each nappy change and ensure that there is no active bleeding.
- 🌀 There are no nerve endings in the cord so it will not cause any pain to your baby when cleaning the cord.
- 🌀 The cord stump will usually drop off within seven to ten days. When it is close to dropping off, you may notice old blood around the base of the cord. It is normal for the cord to smell at this stage. Just clean the cord area as previously described.

➤ **Please Remember:**

- **Bring your baby to the doctor as soon as possible if the skin around the cord becomes red or hot to touch, looks inflamed, is offensive to smell or is noticeably draining pus.**

## 2. Urine

You should expect that the baby would have one wet diaper within the first 24 hours after being born. He will have two wet diapers on day two, three on day three and so on till the breastfeeding is established. Once the breastfeeding is established, he will have five to six wet diapers per day with urine, pale yellow to clear in color.

➤ **Please Remember:**

- **It is hard to tell if the nappy is wet especially when you do not use the cloth nappies but the commercial diapers. You can feel the front and bottom of the diaper to check the crystals inside the diaper—if wet, they should feel full.**

### **3. Bowel**

Babies should also open their first bowel within the first 24 hours of their birth. Their first stool is called ‘meconium’ and is black/dark green in color (See figure 6). After a few days of feeding the bowel motions change color to brown/green (day 3-4) (See figure 7) and then to a yellowish mustard color (day 5 onwards), which is loose with small curds in it like cottage cheese (See figure 8).



Figure 6



Figure 7



Figure 8

Breast milk has some laxative properties in it and that prevents constipation and causes the breastfed babies to pass motion almost after every feed in the first few days of their lives. The normal range of bowel motions is six-eight per day during early days and two-three per day around three-six weeks, after six weeks, the bowel motions might reduce further. Formula-fed babies are more prone to constipation.

➤ **Please Remember:**

- **As far as your baby is growing well with weight gain and is satisfied after feeds, there is not much of a concern. If constipation or diarrhea is a problem or you have any concerns regarding the baby's bowel opening, please seek help from the doctor.**

#### 4. Diaper Change



You should change the diapers as often as it gets soiled especially with motion. This will prevent the diaper rashes for the babies. However, despite of frequent changing, some babies still develop diaper rashes. Use of barrier cream will help in quick recovery. It is fine to apply a thin layer of barrier cream as a protection after every change of diaper.



It is advisable to take note of these:

- 🌀 Gather everything you need and place it within easy reach before commencing the diaper change.
- 🌀 Never leave your baby un-attended while changing diapers.
- 🌀 For girls, wipe from front to back. Baby girls can also have a small loss of blood from the vagina in the first week, similar to period. This lasts for a few days and there is usually only a very small amount of blood.



- 👉 For boys, clean all around the folds of the skin but leave the foreskin in place. Boys can spray urine everywhere, so be very prompt when replacing the diaper.
- 👉 Wash your hands thoroughly after each diaper change.

## 5. Baby Bathing



In humid weathers like in Singapore, it is advisable to bathe your baby daily. There is no appropriate time on when to bathe your baby. As far as you have some help around and you are confident to bathe your baby on your own, you can bathe your baby at any time of the day.



You need to take note of the following:

- 👉 Gather everything you need and place it all within easy reach before you start bathing your baby. Never leave your baby alone in the bath.
- 👉 The temperature of the bath should be warm but not too hot. You can place your elbow or wrist in the water to check the temperature, if it is comfortable then it should be suitable.
- 👉 Make sure the fans and air conditioner of the room is switched off and doors and windows are closed to prevent the baby from losing heat.
- 👉 When the baby is small, you can bathe the baby at any place and not necessarily in the bathroom, as far as the dry area (where you are going to dress the baby after shower) and the wet area (where you bathe the baby) are close to each other (See figure 9).

- 👶 Take note of the skin condition of the baby. It is normal for the baby to have small red spots, which disappear as time passes.
- 👶 Some babies, both boys and girls can also have swollen breasts that feel quite lumpy and hard and may even ooze milk. These are due to the maternal hormones being transferred to the baby before birth. They are of no concern and are usually quickly resolved. Please do not squeeze the breasts.



Figure 9

➤ **Please Remember:**

- **Consult the doctor if your baby's skin rash does not disappear or instead increases with time.**

## 6. Baby Weight

Babies lose some weight from their birth weight within the first few days of life. It is a normal process and should not be misunderstood that babies are not fed well and are hence losing weight.



It is advisable to take note of these:

- 👶 Babies will regain their birth weight within approximately two weeks of life.
- 👶 Your baby will be weighed during each hospital or polyclinic follow-up visit.

👶 It is not easy for some parents to gauge if their babies are putting on weight and often get stressed about their baby's well-being. As far as the baby is cheerful and passing urine and bowels normally as well as feeding well, you should not be overly concerned about the baby's weight.

➤ **Please Remember:**

- **Consult your doctor if you have any doubts and if you are overly concerned about your baby's weight.**

## 7. Normal Infant Behaviour











Each baby is different and has his own temperament. You will be able to know your baby well in the next one-year by observing their behaviour closely to understand them better. This requires lots of patience, time and knowledge on some of the normal infant behaviours in the first few months of their lives. These are described below:

- 👶 They are born knowing how to suck and learn this in the first few days of their lives on how to co-ordinate their sucking and breathing.
- 👶 They have irregular sleeping and feeding times in the first three months.
- 👶 Sneezing is a way babies have of clearing their nose and most babies sneeze several times a day.
- 👶 Hiccups are normal behaviour, it will not harm your baby and no treatment is required.
- 👶 They are able to smile by five to seven weeks.

 Newborn babies can use all their senses:

- They can see and will look at people and things, particularly at people's faces if they are very close but they can't organize the visual images into meaningful shapes.
- They can hear and will enjoy the gentle touch and the sound of a soothing voice.
- They will react to bright light and noise.
- They will grasp your fingers with their hands.
- By seven or eight weeks, they begin to discover their voice and make cooing noises and vowel sounds.
- By about eight weeks, they will listen to what you are saying, and then make noises back as they 'talk' to you.
- In the first eight weeks, babies move their body while they are awake without being aware of it.
- In their third month, they begin to watch their hands and feet waving in the air, and also begin to wave that fist towards your face or some other favorite object.

 You can do the following to encourage your baby's development:

-  Stroke different parts of their body to see how they like to be touched. You can also try doing a light massage. Make sure not to use too much of oil to avoid slipping the baby out of your hands.
-  Speak to them gently and use their name.
-  Play them music and sing to them.
-  Hold them a lot for them to feel secure.
-  Let them look at your face as you talk to them.
-  Copy their little gestures.
-  Gently rock them.
-  A toy facing them can be hung above their cot when they are around 3 months old.



Bring your baby to the doctor if you see the following developmental problems:

- 👶 Unusually floppy or stiff body.
- 👶 Arm or leg on one side is obviously different in muscle tone or power to the other.
- 👶 Fingers are always held in a tight fist after about two months.
- 👶 Not watching faces by two to three months.
- 👶 Not startling to noise.
- 👶 Long periods of crying and persistent difficulties with settling.

## 8. Crying













The crying is the only means of communication for the babies. They cry to gain your attention. It is indeed distressing to see a baby's cries especially when you have already fed and changed the baby.

👉 You are advised to take note of the following regarding the baby's cries:

- 👶 A certain amount of crying is expected.
- 👶 The total amount baby's cries each day increase gradually and it peaks at six weeks of their age.
- 👶 Well-fed babies who are not currently sick cries due to over stimulation and tiredness.
- 👶 The other reasons the baby cries is because they:
  - 👉 Are hungry.
  - 👉 Have wet diapers.
  - 👉 Have wind or pain.
  - 👉 Feel hot, cold or uncomfortable.
  - 👉 Feel tired and unable to sleep.
  - 👉 Feel lonely and want company.

The following are some of the soothing methods that you can try to calm your baby. No one method is better than the other and

soon you will know which method your baby prefers. Once you have a particular method that your baby likes, try repeating it on a regular fashion so that your baby gets used to it:








-  Holding your baby close to your body.
-  Feeding the baby if it is due.
-  Changing the baby's diapers.
-  Talking to your baby in a soft and soothing voice.
-  Singing to your baby.
-  Swaying and gentle rocking.
-  Wrapping using a sling or cloth.
-  Use of music or noise.
-  A warm bath to your baby especially if the baby has not taken bath.
-  If all the above-mentioned do not work, your baby might need some quietness and sleep.

➤ **Please Remember:**

- **Never forget that all babies are different and may respond to different methods of soothing. Do not compare your baby with other babies, as what might work for the other babies might not work for yours. Be patient and stay calm!**



If you are getting over-stressed with baby's cries, try calming yourself using the following methods:

-  Take a warm shower (if confinement practices allow).
-  Make yourself a warm drink.
-  Remind yourself that a baby is crying not to annoy you but this is the baby's only way of communication.
-  Put the baby in the safe cot and walk away.
-  Take deep breaths to calm yourself.
-  Talk to someone.
-  Ask someone to help you.

➤ **Please Remember:**

- **Never shake or toss the baby as it can cause brain injuries.**
- **If your baby's cry sounds different or unusual it may be the first sign of illness particularly if your baby is not feeding well, is not able to be comforted or has a temperature above 37.5C. If you think your baby is ill, take him to your doctor immediately.**

## 9. Sleeping



Sleep is as important for the babies as is their nutrition. A newborn baby's sleep cycle usually lasts for about 20 to 40 minutes with interrupted sleep from two to six hours.

During "light sleep", babies sometimes move and make noises. Their breathing pattern is irregular and they can be awoken easily. During "deep sleep" they are very still and will not move when touched. The number of hours required by the babies according to their age is shown in table 2.

**Table 2 A Guide for Baby's Sleep Hours\***

<b>Baby Age (weeks)</b>	<b>Feeds in 24 hours</b>	<b>Wake time (hours)</b>	<b>Daytime Sleep (hours)</b>	<b>Total Sleep needs in 24 hours</b>
0-8	6 - 8	1 - 1.5	Between feeds	16
8-12	6	1 - 1.5	Between feeds	15.5
12-16	5 - 6	1.5	3	15

16-24	5	1.5 - 2	3	14.5
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\*Adopted from Better Health Channel Australia



To achieve good and safe sleeping habits for your baby, do take note of the following important areas.






### 9.1 Signs of tiredness

Look for early signs of tiredness and try putting the baby to sleep before they become irritable. The following are some signs that babies show when they are tired:

-  Crying.
-  Changes in facial expression for example grimacing and frowning.
-  Minimal movements and little activity.
-  Some babies start sucking when they are tired.
-  Clenched fists.
-  Yawning.





### 9.2 Distractions to sleep

Sometimes, despite of tiredness and all your efforts, babies do not sleep because of the following distractions:

-  Wet or dirty diaper.
-  Hunger.
-  Being too cold or warm.
-  Environmental distractions such as loud noises, bright light or television.
-  Pain such as wind or colicky pain.

### 9.3 Relaxation for your baby

After removing the distractions and if baby is still un-settled, you can try relaxing your baby by using the following methods:

-  A warm bath, if the baby has not taken bath yet.
-  Body massage - ensure that you do not use too much oil.
-  Gentle rocking-cradle your baby close to you and talk softly to him.
-  Wrapping – some babies under the age of four months feel more secure and cozy if they are gently wrapped in a light blanket. They are also less likely to jerk themselves awake if they are wrapped. Make sure their arms are free and



they can still put their hands up to their mouth once they are over one month old.

- 👉 Patting – gently patting your baby on the back or bottom while they are in their cot might help to soothe them.

#### 9.4 Night time feeds

Get your baby back to sleep as quickly as possible after the night feed, so that you can go back to bed and the baby is not over stimulated. Some of the suggestions include:

- 👉 Set up everything you will need before you go to bed (such as fresh diapers and wipes). This will stop the baby from crying longer.
- 👉 Avoid changing the diaper after each feed unless it is absolutely necessary. This will prevent overstimulation of the baby.
- 👉 Don't leave your baby crying for long or they will be too distressed to feed properly and go back to sleep.
- 👉 Keep the light low and your voice to a whisper. This will remind the baby that this is their sleep time.
- 👉 Don't play with your baby and keep the activity to a minimum at night.
- 👉 Return your baby to bed quickly after the feed.

#### 9.5 Safe Sleeping

To provide a safe sleeping environment for the baby, the following guidelines are recommended:

- 👉 Make the baby sleep on the back, from birth and never on the tummy.
- 👉 Put the baby on his side only after the feed and lay him flat on his back after sometime.
- 👉 Make the baby sleep with his face and head uncovered.
- 👉 Put the baby's feet at the bottom of the cot as shown in figure 10.
- 👉 Tuck in bedclothes securely so bedding is not loose.
- 👉 Remove quilts, pillows and toys from the cot.
- 👉 Keep the room well ventilated.
- 👉 Do **NOT** bend the mattress to prop your baby up.
- 👉 Ensure your baby sleeps with the head turned to the left and right for an equal time, to prevent flattening and

asymmetrical moulding of the skull. As your baby grows and starts to focus on particular objects, active stimulation can be used to encourage change of head position such as hanging toys on the cot. Another way to achieve this is to sleep your baby at different ends of the cot.



Figure 10

## 10. Baby Jaundice

### ➤ Please Remember:

- **Everybody who cares for your baby should use the safe sleeping method recommendations to put your baby to sleep.**

Jaundice is very common in babies on day two or later after childbirth. It is noticed as a yellow coloring of the skin and the whites of the eyes. It happens because your baby's own body is unable to get rid of a yellow colored waste product (called bilirubin), which is produced during the normal breakdown of red blood cells. This is due to the immaturity of the baby's liver. Jaundiced babies are more sleepy and lethargic. Sometimes, jaundice is a sign of a more serious problem and needs tests or treatment.

Your baby will be tested for jaundice before the hospital discharge and the doctor will recommend treatment if needed, depending on the level of bilirubin in the baby's blood. For moderate to high levels of bilirubin, the baby will be started on phototherapy (See figure 11), which is an extra

light from fluorescent tubes in an incubator to help the baby eliminate the excess bilirubin. This may be for several hours to days depending on the severity of the jaundice. You can ask more from the baby's doctor about this treatment. You can also read more about jaundice from the links provided at page 57 under the recommending readings.



Figure 11

If your baby is mildly jaundice and the doctor does not recommend phototherapy, you will be discharged home with your baby and will be asked to bring your baby back to the hospital or polyclinic for follow up jaundice check. Pressing the baby's forehead with fingertip will enable you to see if the baby is jaundiced. Placing clothed baby near the window in natural light at home will help the baby's body to eliminate extra bilirubin.

➤ **Please Remember:**

- **Never place your baby in direct sunlight as your baby can get sunburnt.**
- **To help prevent jaundice from occurring or getting worse it is important to feed your baby after birth and thereafter frequently.**
- **It is important for your baby to be seen by a doctor when the baby is between 3 and 5 days old as this is the period when the bilirubin level is usually high.**

## 11. Care of BCG Site

BCG injection is given to your baby to prevent tuberculosis (TB). The injection does not cause any fever on the day of the injection, however, after two-three weeks, the injection site swells and increases in size. This swelling is painless and it reaches its peak at around 6-8 weeks. It then ulcerates and heals forming a scab (See figure 12), which then separates leaving a white scar.



Figure 12



Please take note of the following to care for you baby's BCG injection site:

- ➔ Keep it clean and dry.
- ➔ Let the site heal naturally and do not apply any cream or ointments.
- ➔ If oozy, apply loose sterilize gauze but do **NOT** put sticking plaster or cloth directly to the injection site.
- ➔ Avoid bumps and scratches on the site.
- ➔ Continue with normal activities such as bathing.

### ➤ Please Remember:

- **The child-hood disease can have serious effects on the well-being of your child. You can provide a healthy life to your baby by bringing them for immunizations that protect them from dangerous diseases. You can find out about the details of recommended immunizations for your baby in their 'baby booklet' or from the Health Promotion Board (HPB) website. The link is provided at page 57 under recommended readings.**

## 12. When to seek medical attention for your baby



It is important to seek medical attention as soon as possible if your baby:

- 👉 Makes repetitive jerky movements.
- 👉 Turns blue or very pale.
- 👉 Has quick, difficult or grunting breathing.
- 👉 Has a hoarse cough with noisy breathing or wheezing.
- 👉 Feels unusually hot (fever), cold or floppy.
- 👉 Is very difficult to wake or feels unusually drowsy.
- 👉 Vomits any green bile, or develops a swollen tummy.
- 👉 Develops rash that is causing blisters, pus, weeping or bleeding.
- 👉 Cries in an unusual way or for an unusually long time or seems to be in pain.
- 👉 Bleeding from the nose or any bruising.
- 👉 Keeps sleeping through feeds, refusing feeds or continues to vomit up feeds.
- 👉 Having sticky eyes or conjunctivitis.
- 👉 Diarrheas, which are green, brown in color.
- 👉 Having temperatures above 37.5C.
- 👉 Becomes more jaundiced down to the level of the lower legs or feet.

➤ **Please Remember:**

- **If you are concerned in anyway about your baby's health, you should seek medical attention.**

## Chapter 4







### Breastfeeding










Breast milk is the best source of nourishment for the baby in the first six months after being born (WHO, 2004). This chapter is prepared to support your breastfeeding needs. At the end of this chapter, you will find some important tips regarding breastfeeding. Always remember that ‘practice makes perfect’ which is very true for breastfeeding mothers. After reading this chapter, all you need to do is to persevere and continue to feed your baby and seek for support if needed.

#### 1. Benefits of Breastfeeding

1.1 There are many benefits associated with breast milk for your baby. These are as follows:

-  It is complete nourishment containing all the essential vitamins, minerals, essential fats, carbohydrates and proteins.
-  It is easily digestible.
-  It contains antibodies and other living cells that protect your baby from infections.
-  It is associated with enhanced brain development and improves the baby’s intelligence.
-  It also helps in improving the baby’s eyesight.
-  It is at the right temperature for the baby.

## 1.2 Benefits for the mothers and family:

-  It reduces your chance of having severe bleeding as the uterus contracts during breastfeeding.
-  It protects you from diseases like breast and ovarian cancers as well as from osteoporosis.
-  It helps you to burn extra calories especially the fat stored around hips and thighs during pregnancy. This may help to get back in shape fast especially if the appropriate diet is maintained.
-  It boosts your confidence, as you are able to provide for your baby's emotional and physical needs.
-  It enhances your bonding with your baby.
-  It is friendly to the family's budget-Its FREE! and thus saves cost on formula milk.
-  Breastfed babies fall sick less, thus you and your partner will need to take less days off from work to care for your baby.









The following sections will provide you a guide for your breastfeeding needs and other related issues:

## 2. Breastfeeding Related Issues

### 2.1 Breastfeeding Cues/Signals

The below mentioned are some of the cues you can see your baby is providing before he is hungry:

-  “Clicking” or tongue sucking (“kissing” noise).
-  Rooting-opening the mouth and searching to suck on contact.
-  Hand movements to the mouth and sucking on hands.
-  Moving other extremities.
-  General increased alertness or activity.
-  Crying-This is the late sign of hunger. Avoid reaching to this stage as once the baby becomes irritable it will be very difficult to latch him properly.

## 2.2 Maternal Positioning during Breastfeeding

Any position, sitting or lying down is fine as long as you are comfortable while breastfeeding. Have a glass of water within reach before you start feeding, as many mothers feel thirsty during or after the breastfeeding. Make sure that if you are sitting, your back needs to be upright and well supported with pillows as shown in figure 13. You may also want to use a footrest for more comfort (See figure 14).



Figure 13



Figure 14

If you had caesarean section, it is good to feed the baby while lying down. Always lie on your side and support your head and arms with pillows as shown in figure 15. You can also choose to place a pillow at your back and between the knees for more comfort.



Figure 15

## 2.3 Holding your Baby:

You can hold your baby in any of the four positions such as Cradle Hold, Modified Cradle Hold, Football Hold and Lying Down as shown in figure 16. No one position is better than the



other. You need to find the position of holding your baby that is comfortable to both you and your baby. However, if you had a caesarean section, the Football Hold and the Lying Down positions would be more comfortable for you as it would not hurt your wound.

### Breast-Feeding Positions



Cradle hold



Cross-cradle hold



Football hold



Lying down

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Figure 16

## 3 Breastfeeding Milestones



The following sections will discuss the breastfeeding milestones through the early days of the baby's life.

### 3.1 Breastfeeding Day One:

Most babies are born with sucking reflex and will seek feeding within few hours of birth. They are most active within the first hour of birth and hence early breastfeeding is encouraged. It is common for your baby to have a deep sleep following the first breastfeed.

During your pregnancy and continuing through the first few days after your baby's birth, your breasts produce a milky fluid called 'colostrum'. Colostrum is clear or yellowish in color and is rich in protein and full of antibodies, antioxidants and vitamins that will protect your baby from infections.

Baby's stomach is the size of a cherry on day one and hence small amounts of colostrum produced by the mothers are sufficient to fill their tummy. The amount of colostrum produced by the mothers is generally a few drops.

### 3.2 Breastfeeding Day Two

Your baby is more alert on day two and seeks for more feeding. The pattern of feeding is irregular and you may need to feed more frequently till your milk comes in around day three - day four.

Breastfeeding is on demand feeding and the baby should be fed when he gives the cues for hunger. Stay patient, as your baby is still learning and getting adjusted to the new environment.

### 3.3 Breastfeeding Day Three

By day three, you may notice your breasts beginning to feel fuller and slightly uncomfortable as your milk supply increases. To ease any discomfort, allow your baby to feed frequently. In fact, because breast milk is easily digested, your baby will feed at least 8-12 times in a 24 hours period.

These feeds may be clustered i.e. they may have several short feeds in a short time especially if they previously have had a long sleep.



### 3.4 Breastfeeding Days Four to Seven and Onwards

As your first week of motherhood progresses, your breasts will continue to feel firmer and fuller as your milk supply increases to approximately 500-800 ml per day. Your baby will feed 8-12 times in a 24 hours period.

During this time, it is important to allow your baby to feed from the first breast until he removes himself from the breast before offering the second breast. This is due to the reason that the fat enriched hind milk will allow them to feel fuller for longer and more settled between feeds.

The baby will have growth spurts around weeks three-six and at three months and six months of their life. You will realize that suddenly your feeding sessions will be longer and more frequent. This is of no concern and you and your baby will be back to your normal regime soon.

## 4. Important Tips on Breastfeeding

-  Stay patient and never rush. Breastfeeding is a technique, which can be mastered with practice and needs time.
-  Don't overstress with the baby's cries. Look for hunger

cues early, as it is hard to breastfeed the crying babies. Always note that the baby is learning together with you. Stay calm!

- 🌈 Your milk coming in will depend upon your baby's ability to latch on and how effectively and frequently he sucks on your breasts. Generally, the milk will come in on day 3-4 post delivery.
- 🌈 Baby needs to be fully awake while breastfeeding. It is advisable to wake the sleepy baby by unwrapping him. You can also wake up the baby by changing his diapers or by playing with him before feeding.
- 🌈 The baby should preferably be in skin-to-skin contact with you.
- 🌈 Remember to bring the baby to the breasts and not the breasts to the baby.
- 🌈 Your baby's chin and cheek should be against the breast with the nose free and at the same level with your nipple (See figure 17). It should not be necessary to hold your breast away from your baby's nose.



Figure 17

- 🌈 If your baby is latching on the breast properly you should not feel pain. There should be no stinging, burning, or pinching of the nipple during the feed. At the start, you could feel uncomfortable for 10 to 15 seconds. If the pain persists, take your baby off the breast by inserting your little finger in between their gums to break the seal and re-attach him.
- 🌈 Some signs of a correct latch are that your baby has a

wide-open mouth like a yawn when latching and once latched their chin is very close to the breast tissue (See figure 18). As your baby is sucking, you may experience a painless drawing sensation and you will see full movement of your baby's lower jaw. The cheeks will appear round. You can observe your baby's sucking rhythm such as Suck-Swallow-Pause. Your baby may pause to breathe and it should not be more than 10 seconds. If your baby is falling asleep on your breast, tickle your baby by stroking the ears or feet.



Figure 18

- 🧩 Allow sucking to continue until your baby removes himself from the breast. If it becomes necessary to take your baby off the breast, try the method of slipping your little finger into the corner of your baby's mouth to release the suction or gently pulling down on their jaw.
- 🧩 Let the baby breastfeed from one breast until he loses interest in that breast and stops sucking. This will ensure that he has fat rich hind milk and will be more satisfied after the feed. Alternate your breast for the next feed.
- 🧩 To know if your baby is getting enough milk, you will see that the baby will be satisfied and most likely sleep after the feed. Your breasts will be softer after the feed. Babies will be passing clear urine (five-six wet diapers) and soft stool. Most importantly, as far as your baby is gaining weight and is healthy you should not be concerned for the amount of milk the baby is getting.

- ❖ Never go by the clock while feeding your baby. Look at your baby while feeding and as far as the baby is not sleepy on the breast and sucking well you are doing a good job.
- ❖ To ensure a good supply of milk, continue to feed regularly (every two-three hourly). Make sure the baby latches on well on every feed and if for some reasons you cannot feed the baby, express out the milk manually (See figure 19) or by the use of pumps (See figure 20).



Figure 19

Figure 20

- ❖ Express till your milk flow reduces to a few drops and it should not be more than 30 minutes on each breast.
- ❖ Expression of milk will be especially beneficial if you are going to work soon. To prepare a smooth transition to your work life, start expressing and storing your milk at least two weeks before your work starts. Continue to breastfeed the baby just before you leave for work and

immediately after you return home and at nights. You can express your milk during lunch breaks and just before you leave for home. The expressed milk can be stored in the temperatures as shown in table 3.

Table 3: Expressed Milk Storage

Place of Storage for expressed milk	Recommended storage duration
At room temperature of 25° C	4 hours
In cooler with ice pack at 15° C	24 hours
In fridge at 4° C	48 hours
Frozen milk in 2-door fridge at -20° C	3-6 months
Frozen milk in deep freezer at -20° C	6-12 months
Thawed breast milk in fridge at 4°C	24 hours

\* Adopted from Health Promotion Board (HPB) Breastfeeding Booklet

➤ **Please Remember:**

- **Food such as unripe papaya cooked with fish and fenugreek seeds have been advocated in increasing milk production.**

## 5. Common Breastfeeding Problems

You might experience some common problems while you are breastfeeding due to issues such as incorrect latching (Sore nipples), missed feeding (engorgement), and blocked milk ducts and mastitis.



Do not panic and you can try out the following solutions:

### ☀️ Sore Nipples:

- ♥️ Put few drops of your breast milk on the cracked nipple and allow the nipples to dry.
- ♥️ Initiate feeding from the unaffected breasts as babies suck more vigorously when they first start feeding.
- ♥️ Reduce the duration of feeds but feed more frequently.
- ♥️ Be careful with your latching on technique and if it hurts, you can gently take off the baby from your breasts and re-attach and reposition them.
- ♥️ You may consider not wearing a bra for a while every day.

### ☀️ Engorgement:

- ♥️ As the breasts will be hard and full babies might have some problem with latching on, express out some milk before latching them on the breasts.
- ♥️ Massage your breasts gently while you are feeding and express out the milk after the feed especially if your breasts are still full.
- ♥️ Apply cold pack to relieve the discomfort. If it is very painful, you may consider taking the painkillers provided to you by your doctor.

### ☀️ Blocked ducts:

- ♥️ Massage the blocked area gently and apply gentle pressure towards the nipple.
- ♥️ Initiate feeding from the affected breast so that baby's initial vigorous feeds may relieve the blockage.
- ♥️ Keep the affected breasts as empty as possible and you might consider expressing the milk out if the breasts are full after the baby feeding.



♥ Try out different positions (See figure 16) of baby holding.

✿ Mastitis:

♥ It is a bacterial infection, which usually affects one breast. Common signs are redness, swelling and the area is warm to touch. You may also have fever and experience some pain.

♥ See the doctor or lactation consultant as soon as possible.

♥ Doctor may prescribe you with some antibiotics, for infection or painkillers for the pain.

♥ It is safe to continue to breastfeed while you are on antibiotics or having a fever unless it is too uncomfortable to breastfeed.

♥ Seek early help

➤ **Please Remember:**

- **Successful breastfeeding needs practice, patience and time. Every baby and breast is different. If you have any concerns and issues related to breastfeeding, seek early support. The breastfeeding helpline numbers and support groups are provided to you on page 56.**

## Chapter 5

### Insights for New Parents



The postnatal period is a crucial period for not only mothers and their newborns but also for their entire family. It requires lots of adjustments on the part of new parents and their extended families. To nurture a baby is not a single-handed task. As a parent, you have to rely a lot on each other as well as on your extended family members especially after the hospital discharge. New parents often feel overwhelmed with the baby care needs. Despite of all the information covered in the preceding chapters, there are some basic issues that you must be aware of:

#### **1. Social Support**

Caring for a baby needs lots of support and understanding on the part of the new parents and their families. As a new mother, it is normal to feel overwhelmed with a variety of emotions such as loneliness, worries and tiredness. In order to provide the best for your baby, you need to be ready both physically and emotionally. You need to be well rested with an adequate and nourished diet. It is important that you find someone you can trust to care for your baby so that you can have some time off to get some rest. You can get this help from your family members and health care professionals. The most important thing is to ask for help when you need one.

The support needs in the postnatal period varies due to informational (knowledge on baby care related issues), Instrumental (practical help in baby care and household chores), emotional (your needs for love and empathy) and appraisal (to get feedbacks on self-evaluation in baby care tasks) needs. You can get the instrumental support by delegating your work of both household chores and newborn care tasks to the family members especially your husband. Talking to others especially those who have children can be helpful and reassuring for your emotional well-being. You can read books, surf on the Internet or ask others for the information you require related to baby care. Please be careful for the credibility of the information you retrieve from the Internet. You are advised to speak to the midwife or call the hospital helpline and family members if you have any doubts or if you need feedback on newborn care tasks.



## **2. New Realities and Fine-Tuning your Expectations**



The newborn often brings joy and a new set of responsibilities for parents. As parents, you might not be able to do certain

things that you used to do prior to having a baby. You need to explore your new realities and fine-tune your expectations. It is hard to have any kind of a fixed routine in the first few months of the baby's life. It takes time to get back to a regular pattern after childbirth such as in having regular sleep time. Such an adjustment may last for as long as twelve months. Hence, always try to exercise patience. You will find out that gradually, the baby will need less attention from you and you can then have that extra time for your other work.

### **3. Open Communication**



Sometimes, as a new mother, you will feel that people around you are not very helpful and they are insensitive to your needs. They provide you the help that they wish to provide and not what you need. This can cause undue stress to you and in turn to the entire family. Be assertive and speak up for your self. State how you feel in a simple clear message. Open communication is important not only between the partners but also with the family members and friends who might be ignorant to your feelings.

### **4. A Special Note to Fathers**



As a father, it is important that you grow in the relationship with both your baby and your wife. You need to

be able to make time for them. You also need to ease your partner's burden in baby care tasks and be able to explore for yourself on the special qualities and personalities, which your baby has. Babies love the different feel of their fathers especially, the strong hands and the deep voice. Participating in daily baby care tasks is not a waste of time or unmanly, but a special opportunity to interact with your baby and to get to know the baby better.

Your partner will need time to adjust to her new role as a mother and to physically revert to her non-pregnant state. It also helps that you do not make critical comparisons between generations such as saying, "my mother managed to bring up children and it was not a problem to her!" She will appreciate your support and understanding at this stage especially when she is also emotionally vulnerable.

If your wife is breastfeeding, her main attention must be the baby, but this does not mean that she does not care about you or does not want to exhibit the closeness with you. Explore new ways of being loving and close, and accept that this phase will pass as your child grows and will then need less attention from the both of you. This will then create opportunities for more time together between you and your wife.

## 5. Summary

The postnatal period is a special time in your life for joy and learning as new parents and also for your families. It is a great

opportunity to know your baby and also about yourself as a parent. It takes time to develop the right skills and confidence of looking after your newborn. Hence, try not to rush in learning newborn care tasks, stay calm in times of undue stress and most importantly savor and enjoy this postnatal period.



# Useful Information

## 1. Useful Contacts

### ➤ NUH Resources

National University Hospital (NUH)-Main Line 6779 5555  
Website: [www.nuh.com.sg](http://www.nuh.com.sg)  
Email: [NUH\\_enquiries@nuhs.edu.sg](mailto:NUH_enquiries@nuhs.edu.sg)

NUH Accident & Emergency (A&E) 6772 5000  
NUH Children's Emergency 6772 2555

NUH Ward 9 A (Kent Ridge Wing) 6772 5960 / 6772 3960  
NUH ward 48 (Main Building) 67725480/6772 3480  
NUH Ward 9 A Nursery 6772 5496  
NUH Ward 48 Nursery 6772 5483  
NUH Breast feeding Helpline 9722 0376  
NUH Clinic A (Children's Clinic) 6772 2002  
NUH Clinic G (Women's Clinic, Main Building) 6772 5403  
NUH Women's Clinic (Kent Ridge Wing) 6772 2255  
NUH Patient Service Center 6772 4459

NUH Women's Emotional Health Service 6772 2037  
Website: <http://www.med.nus.edu.sg/pcm/service5.htm>

### ➤ Additional Resources

Breastfeeding Mother's Support Group (BMSG) Singapore Hotline  
BMSG Talk Line 6339 3558  
Website: [www.breastfeeding.org.sg](http://www.breastfeeding.org.sg) 6337 0508  
Email: [counseling@breastfeeding.org.sg](mailto:counseling@breastfeeding.org.sg)

Joyful Parenting and Breastfeeding 6488 0286

Association for Breastfeeding Advocacy (ABAS) Singapore  
Website: [www.abas.org.sg](http://www.abas.org.sg)

## 2. Recommended Readings

The following readings and links are provided for your additional knowledge and they may help you with some of your queries. If you have doubts it is advisable to seek professional support by contacting through hospital helpline.

### ➤ Books

- Brott, A. A. (2004). *The New Father: A Dad's Guide to the First Year*. London: Abbeville Press.
- Jana, L. A., & Shu, J. (2005). *Heading Home with Your Newborn: From Birth to Reality*. USA: American Academy of Pediatrics.
- Karp, H. (2003). *The Happiest Baby on the Block: The New Way to Calm Crying and Help Your Newborn Baby Sleep Longer*. New York: Bantam Dell.
- Mohrbacher, N., & Kendall-Tackett, K. (2010). *Breastfeeding Made Simple: Seven Natural Laws for Nursing Mothers*. Oakland: New Harbinger publications.
- Murkoff, H., Mazel, S., Eisenberg, A., & Hathaway, S. (2003). *What to Expect the First Year*. New York: Workman Publishing.
- Pantley, E. (2002). *The No-Cry Sleep Solution: Gentle Ways to Help Your Baby Sleep Through the Night*. New York: McGraw Hill.
- Placksin, S. (2000). *New York: Mothering the New Mother: Women's Feelings & Needs After Childbirth: A Support and Resource Guide*. USA: New market Press.
- Sears, W., & Sears, M. (2008). *The Baby Book: Everything You Need to Know About Your Baby from Birth to Age Two*. New York: Little, Brown and Company, Hachette Book Group.
- Weissbluth, M. (2005). *Healthy Sleep Habits, Happy Child*. USA: The Random House Publishing group.
- Weissinger, D, West D., & Pitman, T. (2010). *The Womanly Art of Breastfeeding*. USA: Balantine Books.

### ➤ Websites

- [www.hpb.gov.sg/pregnancyparenting](http://www.hpb.gov.sg/pregnancyparenting)
- <http://www.babycenter.com.sg>
- <http://www.whatwerewethinking.org.au/>
- <http://www.brochures.mater.org.au/>
- <http://beststart.org/index.eng.html>
- <http://www2.aap.org/breastfeeding/curriculum/index.html>



### 3. Template for Writing Journal

Track the stressors in your life by answering the questions given below. This will enable you to understand the challenges you are facing so that you can cope with them better

<b>Questions</b>	<b>Answers</b>
What was the most stressful event in the past week?	
How did you feel both physically and emotionally?	
How did you act in response?	
What did you do to make yourself feel better?	
What will you do if you face similar challenges in future?	

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Appendix 13  
Outline for Weekly Telephone Sessions \*

Serial No.	Activities	Time	Facilitator
1	Discussion on contents of Weekly journal and explore any new stressors/challenges which could have arisen during the past week	10 minutes	PI
2	Answer to mothers' queries according to their individual needs	10 minutes	PI
3	Discussion on any queries on the contents of the booklet and reinforcement on the importance of reading the booklet.	10 minutes	PI

\* The date and time for the next telephone session will be determined. There will be three telephone sessions in total. The timing and number of the phone call is an approximate gauge and it may vary according to maternal and newborn needs.

Some of the questions and discussion areas that will take place during the telephone sessions will be as follows:

- How have you been for the past week?
- Have you managed to keep the weekly journal? If yes, shall we discuss about it?
- What were your main challenges in the past week?
- Answer to mother's queries according to her challenges
- Applaud mothers on her accomplishments in newborn care and provide positive feedback
- Summarize the key points in newborn care and encourage mothers to read the booklet and seek help when required
- Reinforce to continue to write the journal thus keeping track of challenges and mood swings for the emotional well-being of the mother
- Schedule the date and timing of the next call at the mother's convenience by asking her politely
- Before hanging up the call, make sure to ask mothers if they have any more questions.

## Appendix 14

### Edinburgh Postnatal Depression Scale (EPDS) (Cox, Holden, & Sagovsky, 1987)

[Instruction] As you have recently had a baby, we would like to know how you are feeling now. Please fill in completely the circle beside the answer to which comes closest to how you have felt in the past seven days, not just how you feel today. Here is an example already completed.

I have felt happy:

- Yes, most of the time
- Yes, some of the time
- No, not very often
- No, not at all

This would mean, "I have felt happy some of the time" during the past week. Please complete the other questions in the same way.

Please complete the other questions in the same way.

In the past seven days			
1.	I have been able to laugh and see the funny side of things:	6.	Things have been getting on top of me:
<input type="radio"/>	As much as I always could	<input type="radio"/>	Yes, most of the time I haven't been able to cope at all
<input type="radio"/>	Not quite so much now	<input type="radio"/>	Yes sometimes I haven't been coping as well as usual
<input type="radio"/>	Definitely not so much now	<input type="radio"/>	No, most of the time I have coped quite well
<input type="radio"/>	Not at all	<input type="radio"/>	No, I have been coping as well as ever
2.	I have looked forward with enjoyment to things:	7.	I have been so unhappy that I have had difficulty sleeping:
<input type="radio"/>	As much as I ever did	<input type="radio"/>	Yes, quite a lot
<input type="radio"/>	Rather less than I used to	<input type="radio"/>	Yes, sometimes
<input type="radio"/>	Definitely less than I used to	<input type="radio"/>	No, not much
<input type="radio"/>	Hardly at all	<input type="radio"/>	No, not at all
3.	I have blamed myself unnecessarily when things went wrong:	8.	I have felt sad or miserable:
<input type="radio"/>	Yes, most of the time	<input type="radio"/>	Yes, most of the time
<input type="radio"/>	Yes, some of the time	<input type="radio"/>	Yes, quite often
<input type="radio"/>	Not very often	<input type="radio"/>	Not very often
<input type="radio"/>	No, never	<input type="radio"/>	No, not at all
4.	I have felt worried and anxious for very good reason:	9.	I have been so unhappy that I have been crying
<input type="radio"/>	No, not at all	<input type="radio"/>	Yes most of the time
<input type="radio"/>	Hardly	<input type="radio"/>	Yes quite often
<input type="radio"/>	Yes, sometimes	<input type="radio"/>	Only occasionally
<input type="radio"/>	Yes,, very often	<input type="radio"/>	No, never
5.	I have blamed myself unnecessarily when things went wrong:	10.	The thought of harming myself has occurred to me
<input type="radio"/>	Yes, quite a lot	<input type="radio"/>	Yes, quite often
<input type="radio"/>	Yes, sometimes	<input type="radio"/>	Sometimes
<input type="radio"/>	No, not much	<input type="radio"/>	Hardly ever
<input type="radio"/>	No, not at all	<input type="radio"/>	Never

## Appendix 15

### Background Information of Mothers (Phase II)

[Instruction] Please tick your answer or fill in the blanks for the following questions.  
All information collected will be kept confidential.

7. Age: \_\_\_\_\_ (Years)
8. Ethnicity:  
(1) Chinese    (2) Malay    (3) Indian    (4) Others: \_\_\_\_\_
9. Marital status:  
(1) Married    (2) Single    (3) Others: \_\_\_\_\_
10. Highest education level:  
  
(1) Primary school  
(2) Secondary school  
(3) ITE/Polytechnic/Junior College  
(4) University
11. Occupation (if applicable): \_\_\_\_\_
6. Monthly household income:  
  
5) <\$1000  
6) \$1000-\$3000  
7) \$3000-\$5000  
8) >\$5000
7. Did you attend any prenatal courses?  
  
(1) Yes, in total how many hours? \_\_\_\_\_  
  
(2) No, reason: \_\_\_\_\_
8. Type of birth  
  
(1) Normal Vaginal Delivery (For example water birth), Please specify \_\_\_\_\_  
  
(2) Assisted Delivery (Vacuum/ Forceps), Please Specify \_\_\_\_\_  
  
(3) LSCS (Emergency/Elective), Please Specify \_\_\_\_\_

## Appendix 16

### Process Evaluation Semi-Structured Interview Guide

For participants from the intervention group:

1. How did you feel participating in this programme?
2. What were your main stressors in the early postpartum period?

Probe: How were your first few days with the baby? Did you have any support?

3. Did you find the Postnatal Psychoeducation Programme provided to you beneficial especially in enhancing your confidence in newborn care?

*Probe: If so how? If not- why not?*

4. Did you find the Postnatal Psychoeducation Programme provided to you useful in improving your help-seeking behavior?

*Probe: If so how? If not- why not?*

5. Did you find the Postnatal Psychoeducation provided to you useful in improving your mood and decreasing your negative feelings?

*Probe: If so how? If not- why not?*

6. Did you find the Postnatal Psychoeducation provided to you useful in improving the knowledge about newborn care post delivery?

*Probe: If so how? If not- why not?*

7. Did you find the midwife home visit and delivering education at your home environment beneficial?

*Probe: If so how? If not- why not?*

8. Do you think it is worthwhile to spend extra time on receiving this Postnatal Psychoeducation

*Probe: Any suggestions for improvement?*

9. Which aspect of the PPP such as home visit, follow-up phone calls or educational booklet was beneficial for you?
10. What were the main strengths or weaknesses of the postnatal psychoeducation programme?
11. How can this programme be improved further and do you think this programme be continued?



## Postnatal Psychoeducation Programme

Postnatal Psychoeducation Programme is prepared based on research findings from Western and local studies. The experts in midwifery as well as the Obstetricians have endorsed it. The new mothers wish to have continuity of care in terms of home visits by midwives after the hospital discharge. This programme will be delivered at your comfortable home environment and will prepare you in newborn and self-care tasks. The aims are to enhance your confidence in looking after your baby and yourself as well as to raise your awareness to seek for help when you need one, which will eventually to improve your psychosocial well-being.

## Appendix 17

### Brochure for Advertizing PPP

#### Brought to you by:

Alice Lee Centre for Nursing Studies  
Yong Loo Lin School of Medicine  
Level 2, Clinical Research Centre, Blk MD11,  
10 Medical Drive, Singapore 117597



*For More Enquiries,  
Please Contact:*

Ms SHEFALY SHOREY  
HP: 94794955



## Postnatal Psychoeducation Programme (PPP)

*A Help at your door step!*

Specially catered for first-time mothers  
who delivered their babies at NUHS



## Postnatal Psychoeducation Programme



Postnatal period (the period after childbirth) is a crucial transitional period for the well-being of both mothers and babies. It is especially important for first-time mothers who do not have prior newborn care experience for their smooth transition to motherhood. The birth of a new

## Postnatal Psychoeducation Programme

member in a family can also affect family dynamics due to new adjustments to be made. The lack of care during this period may not only affect the health of mothers and babies but may also have negative effects on maternal confidence in looking after their babies and their future reproductive decisions.

Hence, this programme is prepared to help first-time mothers to cope well with the demands during the early postnatal period. You will be provided the latest research based up-to-date information on newborn and self care. An educational booklet, which is specially prepared for this programme, will be provided to you for the reinforcement of the information covered by a midwife.

## Postnatal Psychoeducation Programme



### Information on PPP:

- You will be visited once at your home between days 5-14 after your delivery.
- You will be called via phone for three consecutive weeks after the home visit.
- You will be given an educational booklet and we will talk about your concerns about self and newborn care.

## Appendix 18

### Participant Information Sheet (Phase II)

You are being invited to participate in a research study.

It is important to us that before you take part in this research study, the study must be explained to you and you must be given the chance to ask questions. Please read carefully the information provided here. If you agree to participate, please sign the informed consent form. You will be allowed to take home the copy of this document with you.

#### 1. Study Information

##### Protocol Title:

Effectiveness of Postnatal Psychoeducation Program on Outcomes of First-time Mothers in Singapore: A Randomised Controlled Trial

##### Principal Investigator & Contact Details:

Dr. He Hong-Gu  
Assistant Professor  
Alice Lee Centre for Nursing Studies  
Yong Loo Lin School of Medicine  
National University of Singapore  
Level 2, Clinical Research Centre, Block MD11  
10 Medical Drive, Singapore 117597  
Tel: 6516 7448  
Fax: 6776 7135  
Email: nurhhg@nus.edu.sg

##### Co-investigator & Contact Details:

Professor Sally Chan  
Professor and Head  
Alice Lee Centre for Nursing Studies  
Yong Loo Lin School of Medicine  
National University of Singapore  
Level 2, Clinical Research Centre, Block MD11  
10 Medical Drive, Singapore 117597  
Tel: 65163117  
Fax: 6776 7135  
Email: nurcwcs@nus.edu.sg

A/Professor Chong Yap Seng  
Associate Professor  
Department of Obstetrics and Gynecology  
National University Hospital and  
Yong Loo Lin School of Medicine,  
National University of Singapore  
Level 2, Clinical Research Centre, Block MD11  
10 Medical Drive, Singapore 117597  
Tel: 6772 4272 / 6516 5852

Email: obgcys@nus.edu.sg

Ms. Shefaly Shorey

PhD Student

Alice Lee Centre for Nursing Studies

Yong Loo Lin School of Medicine

National University of Singapore

Level 2, Clinical Research Centre, Block MD11

10 Medical Drive, Singapore 117597

Tel: 94794955

Email: a0090479@nus.edu.sg

## 2. Purpose of the Research Study

You are invited to participate in a research study that aims to examine the effectiveness of a Postnatal Psychoeducation Programme (PPP) on first time mother's maternal outcomes such as self-efficacy in newborn care, help-seeking behaviour (social support) and Postnatal depression after childbirth in Singapore. If the proposed intervention is effective, it can be used as a routine intervention to improve postnatal supportive care.

You are invited in this study because you are:

- 21-45 years old
- first time mothers
- able to read and write in English

You would not be able to continue to participate in this study if you:

- have delivered a baby with apparent congenital anomalies or delivered stillbirth
- are going to be discharged home without your baby.
- would not stay in Singapore for next 12 weeks post delivery
- have medical or psychiatric illness before or during the pregnancy
- have complicated assisted delivery such as vacuum or forceps with 4th degree tear

This study will recruit approximately 126 mothers from National University Hospital (NUH) over a period of 9 months, from 1<sup>st</sup> September 2012 to 30<sup>th</sup> May 2013.

## 3. What procedures will be followed in this study

If you are willing to participate in this study, you will be approached at postnatal wards after delivery to obtain some background information such as age, ethnicity and marital status as well as baseline information on your self-efficacy, social support and depression status. Some information on your baby's condition at time of birth and after birth will also be taken from your baby's notes. You will be approached at your bed- side and a questionnaire survey will be given to you to fill up. Approximate time to fill up the questionnaires is 30 minutes. Researcher will take your phone number so that you can be contacted after the hospital discharge.

Mothers then will be randomly assigned to either control or Interventional group.

*Control group:* The mothers in control group will receive a standard care. The standard care involves a routine postnatal support in the wards followed by the postnatal hospital visit between week one to week six depending upon their individual needs and the type of delivery. There will not be any home visit or face-to-face interview for the mothers in control group.

*Intervention group:* The mothers in intervention group will receive a standard care and additional psychoeducation programme. The psychoeducation programme involves a home visit by a midwife, three phone calls and an educational booklet. The main aim of the programme is to improve your confidence in newborn care as well as to enhance your psychosocial wellbeing. The home visits will cover various topics from newborn care to help seeking behaviour. Following a visit to your home, which will be approximately of 90 minutes, phone calls will be made on three consecutive weeks (once per week) to answer your additional queries and concerns. The duration of the each phone call will be approximately 30 minutes depending upon your individual needs. The educational booklet will be provided to you to reinforce your learning as well as a back up for your reference. This booklet has been prepared based on latest evidence as well as feedback from local first-time mothers.

*For both control and interventional groups:* Researcher will call at approximately 6 weeks and 12 weeks post delivery to collect data using the same questionnaire that you filled up during the hospital stay as a follow up.

At the end of the intervention the intervention group mothers who have different self-efficacy scores and those who consented for the audio-recorded interviews will be invited at week 12 for their feedback on the satisfaction with the psychoeducation programme. Those mothers who do not consent for the audio recording of their interviews will not participate in the interview. However, this will not affect any of the care they will and have received.

#### 4. What is not standard care or experiment in this study?

The Postnatal Psychoeducation Programme (PPP) is not a standard care. It is an additional support, which will be provided to the mothers in the intervention group on top of the standard care. It involves a postnatal home visit by a midwife, three phone calls on weekly basis and an educational booklet for the reinforcement and retention of what has been learned during the home visits.

#### 5. Alternatives to participation?

If you decide not to participate in this study you will still receive the standard care from the health care professionals. The standard care involves postnatal support by nurses and midwives while you stay in the hospital and follow up hospital visit with doctor between week one to week six depending upon your needs and type of delivery.

#### 6. Your Responsibilities in This Study

If you agree to participate in this study, you should be prepared to expect a home visit by the researcher who is a trained midwife followed by weekly phone calls for three consecutive weeks. You will also be contacted via phone at approximately 6 weeks and 12 weeks post delivery. You are also requested to be prepared to fill up the questionnaire and to answer the questionnaire via phone.

## 7. Withdraw from the study

You are free to withdraw your consent and discontinue your participation at any time without prejudice to you or any compromise in your care. The educational programme, phone calls and booklet provided during this study are an adjunct to the standard practices in the postnatal period. Hence, your withdrawal from the study will not affect your standard postnatal care. If you decide to stop taking part in this study, you should tell the Principal Investigator.

## 8. Possible Risks and Side Effects

There is no risk or any discomforts for you to participate in this study. The only inconvenience will be the time spent for filling /answering the questionnaire. In fact, it is expected that the psychoeducation programme during home visit and the follow up phone calls might enhance your self-efficacy in newborn care, help seeking behaviour from both health care professionals and significant others as well as decrease postnatal depression.

## 9. Possible Benefits from Participating in the Study

There is no assurance that you will benefit from participation in this study. However, your participation in this study will increase your awareness of confidence level in newborn care and support needs after childbirth. The educational programme during home visits by an experienced midwife might enhance your self –efficacy and help seeking behaviour and decrease your postnatal depression. It will also provide you an opportunity to share your concerns and get up to date information at your door- step.

## 10. Subject's Rights

Your participation in this study is voluntary. You may stop participating in this study at any time. Your questions will be answered up to your satisfaction.

In the event of any new information becoming available that may be relevant to your willingness to continue in this study, the Principal Investigator or his/her representative will inform you in a timely manner.

## 11. Compensation for Injury

By signing this consent form, you will not waive any of your legal rights or release the parties involved in this study from liability for negligence.

## 12. Confidentiality of Study and Medical Records

Information collected for this study will be kept confidential. Your records, to the extent of the applicable laws and regulations, will not be made publicly available. All the data will be stored in a locked cupboard and authorized-access stand-alone computer in the Alice Lee Centre of Nursing Studies office. The access to the computer will be password protected. Only the principal investigator and co-investigators will be able to access the data. The researchers will take full responsibility to secure the research data. Complete anonymity will be ensured for the study participants.

However, the National University Health System (NUHS), National Healthcare Group (NHG) Domain-Specific Review Board and the Ministry of Health will be granted direct access to your original medical records to check study procedures and data, without making any of your information public. With consent, you (or your legally acceptable representative, if relevant) are authorizing such access to your study.

Data collected and entered into the Case Report Forms are the property of Alice Lee Centre for Nursing Studies, Yong Loo Lin School of Medicine, and National University of Singapore (NUS). In the event of any publication regarding this study, your identity will remain confidential.

### 13. Costs of participation

If you take part in this study there is absolutely no costs required nor payments upon your participation.

### 14. Research related injury and compensation

Alice Lee Centre for Nursing studies, National University of Singapore without legal commitment will compensate you for the injuries arising from your participation in the study without you having to prove Alice Lee Centre for Nursing Studies, is at fault. There is however conditions and limitations to the extent of compensation provided. You may wish to discuss this with your Principal Investigator Dr He Hong-Gu (See contact details under section 15).

### 15. Who to contact if you have any questions?

If you have questions about this research study, you may contact the Principal Investigator, Dr. He Hong-Gu, Alice Lee Centre for Nursing Studies, Yong Loo Lin School of Medicine, National University of Singapore, by phone at 6516 7448 or by email at nurhhg@nus.edu.sg or anyone in the team as mentioned previously.

The study has been reviewed by the NHG Domain Specific Review Board (the central ethics committee) for ethics approval.

If you want an independent opinion of your rights as a research subject you may contact the NHG Domain Specific Review Board Secretariat at 6471-3266 (830 am-530 pm).

If you have any complaints about this research study, you may contact the Principal Investigator or the NHG Domain Specific Review Board Secretariat.

## Appendix 19

### Consent Form (Phase II)

Protocol Title:

Effectiveness of Postnatal Psychoeducation Program on Outcomes of First-time Mothers in Singapore:  
A Randomised Controlled Trial

Principal Investigator & Contact Details:

Dr. He Hong-Gu  
Assistant Professor  
Alice Lee Centre for Nursing Studies  
Yong Loo Lin School of Medicine  
National University of Singapore  
Level 2, Clinical Research Centre, Block MD11  
10 Medical Drive, Singapore 117597  
Tel: 6516 7448  
Fax: 6776 7135  
Email: nurhgg@nus.edu.sg

I voluntarily consent to take part in this research study. I have fully discussed and understood the purpose and procedures of this study. This study has been explained to me in a language that I understand. I have been given enough time to ask any questions that I have about the study, and all my questions have been answered to my satisfaction.

\_\_\_\_\_  
Name of Participant                      Signature                      Date

#### *Witness Statement*

I, the undersigned, certify to the best of my knowledge that the participant signing this informed consent form had the study fully explained in a language understood by him / her and clearly understands the nature, risks and benefits of his / her participation in the study.

\_\_\_\_\_  
Name of Witness                      Signature                      Date

#### *Investigator Statement*

I, the undersigned, certify that I explained the study to the participant and to the best of my knowledge the participant signing this informed consent form clearly understands the nature, risks and benefits of her participation in the study.

\_\_\_\_\_  
Name of Investigator /  
Person administering consent                      Signature                      Date



## Appendix 20 Audio Recording Consent

Protocol Title:

Effectiveness of Postnatal Psychoeducation Program on Outcomes of First-time Mothers in Singapore:  
A Randomised Controlled Trial

Principal Investigator & Contact Details:

Dr. He Hong-Gu  
Assistant Professor  
Alice Lee Centre for Nursing Studies  
Yong Loo Lin School of Medicine  
National University of Singapore  
Level 2, Clinical Research Centre, Block MD11  
10 Medical Drive, Singapore 117597  
Tel: 6516 7448  
Fax: 6776 7135  
Email: nurhhg@nus.edu.sg

Consent for Audio/ Video Recording of Interview

I voluntarily consent to have an audio recording of my interview taken as part of the research study. I understand that the audio recording is for the purpose of ensuring accuracy of the interview transcription. I understand that measures will be taken to anonymise the data collected, to protect my privacy. I also understand that the audio recording taken will be kept confidential and be destroyed 10 years after the completion of this research study.

\_\_\_\_\_  
Name of Participant

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

### *Investigator Statement*

I, the undersigned, certify that I explained the study to the participant and to the best of my knowledge the participant signing this informed consent form clearly understands the nature of audio recording.

\_\_\_\_\_  
Name of Investigator /  
Person administering consent

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

Appendix 21  
Ethics Approval (Phase II)

View

Page 1 of 2



6 Commonwealth Lane  
Level 6 GMTI Building  
Singapore 149547  
Tel: 6496 8900 Fax: 64966870  
www.nhg.com.sg  
RCB No. 200002150H

NHG DSRB Ref: 2012/00182

18 May 2012

Dr Hong-Gu He  
Department of Alice Lee Centre for Nursing Studies  
National University Singapore

Dear Dr Hong,

**NHG DOMAIN SPECIFIC REVIEW BOARD (DSRB) APPROVAL**

**STUDY TITLE: Effectiveness of Postnatal Psychoeducation Program on Outcomes of First-time Mothers in Singapore: A Randomized Controlled Trial**

We are pleased to inform you that the NHG Domain Specific Review Board has approved the above research study to be conducted in National University Hospital.

The approval period is from **18 May 2012 to 17 May 2013**. The NHG DSRB reference number for this study is **2012/00182**. Please use this reference number for all future correspondence.

The documents reviewed are:

- a) NHG DSRB Application Form: **Version No. 0**
- b) Participant Information Sheet and Consent Form: **Version dated 15/05/2012**
- c) Postnatal Psychoeducation Programmes (PPP)-Educational Booklet for First-Time Mothers: **Version dated 17/05/2012**
- d) Questionnaires: **Version dated 15/05/2012**

Continued approval is conditional upon your compliance with the following requirements:

1. Only the approved Participant Information Sheet and Consent Form should be used. It must be signed by each subject prior to initiation of any protocol procedures. In addition, each subject should be given a copy of the signed consent form.
2. No deviation from or changes to the study should be implemented without documented approval from the NHG DSRB, except where necessary to eliminate apparent immediate hazard(s) to the study subjects, or when the change(s) involves only logistical or administrative aspects of the study.

[http://www.research.nhg.com.sg/sop/process/ROMP/Show\\_Email\\_Template?submissi...](http://www.research.nhg.com.sg/sop/process/ROMP/Show_Email_Template?submissi...) 5/18/2012

3. Any deviation from or changes to the study to eliminate an immediate hazard should be promptly reported to the NHG DSRB within seven calendar days.
4. Please note that for studies requiring Clinical Trial Certificate, apart from the approval from NHG DSRB, no deviation from, or changes of the Research Protocol and Participant Information Sheet and Consent Form should be implemented without documented approval from the Health Sciences Authority unless otherwise advised by the Health Sciences Authority.
5. Please submit the following to the NHG DSRB:
  - a. All unanticipated problems involving risk to subjects or others should be reported using the NHG DSRB Unanticipated Problems Involving Risk to Subjects or Others Reporting (UPIRTSO) Form. Reporting guidelines are available at [www.research.nhg.com.sg](http://www.research.nhg.com.sg).
  - b. Report(s) on any new information that may adversely affect the safety of the subject or the conduct of the study.
  - c. NHG DSRB Study Status Report Form – this is to be submitted 4 to 6 weeks prior to expiry of the approval period. The study cannot continue beyond **17 May 2013** until approval is renewed by the NHG DSRB.
  - d. Study completion – this is to be submitted using the NHG DSRB Study Status Report Form within 4 to 6 weeks of study completion.
7. The NHG Research QA Program aims to promote responsible conduct of research in a research culture with high ethical standards, and to identify potential systemic weaknesses and make recommendations for continual improvement. Hence, this research study may be randomly selected for study review by the QA team. For more information, please visit [www.research.nhg.com.sg](http://www.research.nhg.com.sg).

Yours sincerely,

A/Prof Low Yin Peng  
Chairman  
NHG Domain Specific Review Board D

Cc: Institutional Representative, NUHS  
c/o Research Office, NUHS  
Departmental Representative of Alice Lee Centre for Nursing Studies, NUS

(This is an electronic-generated letter. No signature is required.)

## Appendix 22 Normality Q-Q Plots of Outcome Variables

Figure 1: Perceived Maternal Parental Self-efficacy Scale Score at Baseline

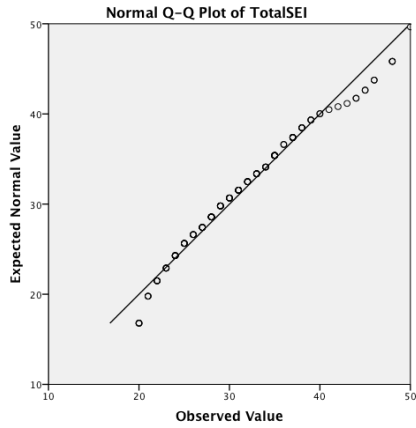


Figure 2: Perinatal Infant Care Social Support Scale Score at Baseline

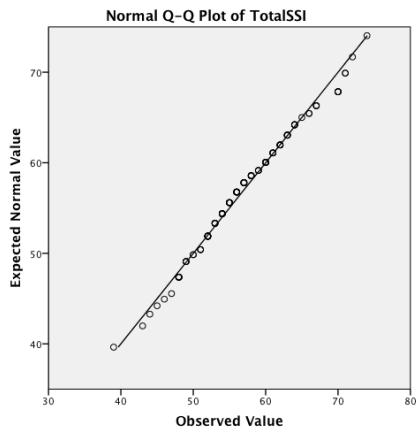


Figure 3: Edinburgh Postnatal Depression Scale Score at Baseline

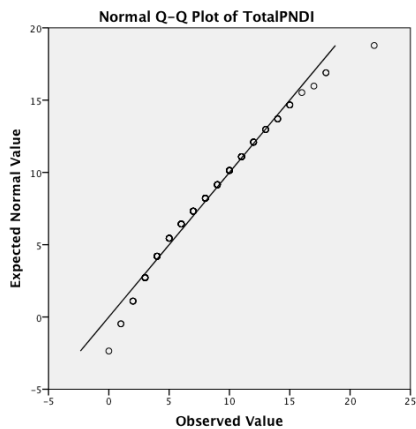


Figure 4: Perceived Maternal Parental Self-efficacy Scale Score at Posttest-1 (6weeks postpartum)

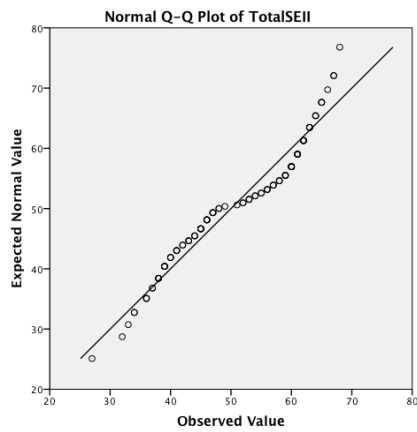


Figure 5: Perinatal Infant Care Social Support Scale Score at Posttest-1 (6weeks postpartum)

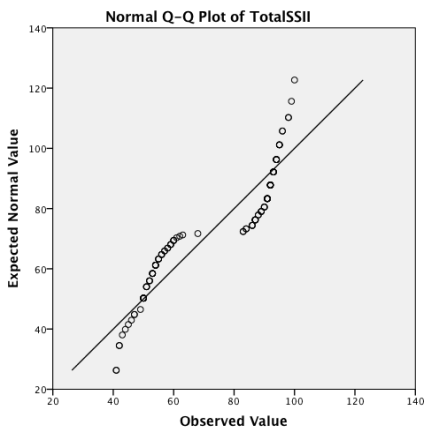


Figure 6: Edinburgh Postnatal Depression Scale Score at Posttest-1 (6 weeks postpartum)

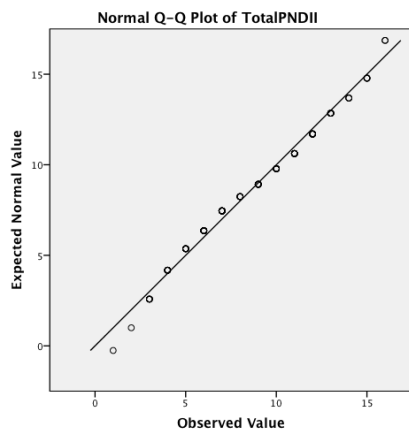


Figure 7: Perceived Maternal Parental Self-efficacy Scale Score at Posttest-2 (12 weeks postpartum)

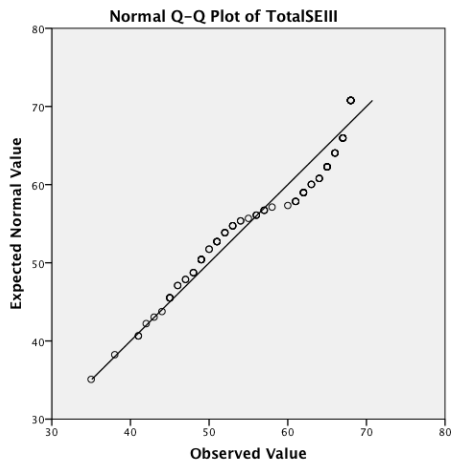


Figure 8: Perinatal Infant Care Social Support Scale Score at Posttest-2 (12 weeks postpartum)

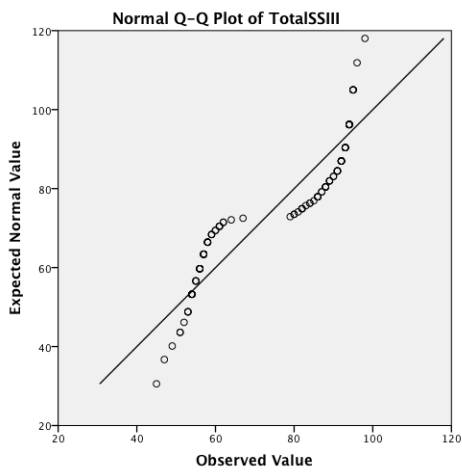
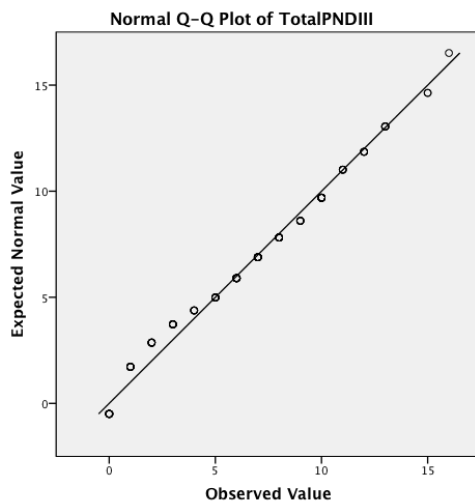


Figure 9: Edinburgh Postnatal Depression Scale Score at Posttest-2 (12 weeks postpartum)



## Appendix 23

### Thematic Analysis Process of One Participant

Interview 6: 26 years old. Total Interview time 21 minutes and 30 seconds

MW: Hi Hi Geetha thank you very much for providing me this opportunity to come to your house once again and see you and your lovely family

M: Thank you Shefaly (mother laughed)

MW: Thank you so much..so Geetha what is happening now is that I am gonna ask you some questions its regarding the postnatal psychoeducation programme which I facilitated to you couple of weeks ago..ah.. I am here to understand from you that how you found this programme.. what was your satisfaction level..how we can improve it

M: Oh.. it was really wonderful Shefaly.. actually ah.. **when I delivered unfortunately my parents or ahmm.. even my husband's parents we both I mean they both couldn't come to Singapore to assist us...so we both were there alone to take care of the baby and moreover you know it was little disappointing that I had the caesarean section and I was worried about that the recovery period will be more and it going to be new baby..** but then **I really feel that there was lucky when you just came entered the room (mother laughed) and gave me those chits and I chose the ah..**

MW: home visit ya..

M: **and then ah.. you told you gonna come home and you are going to follow up with some calls.. I was like OK.. god has send someone**

MW: (both mother and midwife laughed)... ok that's that's that's very nice to hear.. so can I say overall participating in this programme your experience was satisfied

M: oh no... I should say it is more than excellent

MW: oh..thank you so much... its very nice to hear from expressive mothers like you

M: thank you

MW: ah.. I really appreciate that.. alright.. can I ask you a bit about how you find this educational programme has provided you ah.. help you ah.. being prepared for the early motherhood

M: ah.. you know first time mom I actually did not know you know I just thought baby will be born and ya.. you are going to feed the baby and then I did not know that the feeding hours are going to be so you know.. not not going to be so consistent.. anytime baby will feed and all that.. I did not know so much.. I just thought I just pregnant and I am becoming a mother and there is going to be a routine with the baby (mother smiled) ..but then I understood the reality because in my family I am the first one.. I did not have any I mean all my cousins are younger to me so I had not seen a newborn ah.. newborn baby and what is its life cycle so...once..ah.. you know I delivered even in the hospital itself you know..they said once in one hour two hour baby was getting hungry..and once in two hours.. I mean anytime you just need to change the diaper and already you know you are so exhausted and there is so much of fatigue and then ah.. I was like I was just trying to get adjusted with this and then you came for the home visit and I was trying to find out answers for many things you know why the baby is not latching on properly you know.. ah.. why is it feeling uncomfortable and then you came..I remember I actually..I mean..you saw how I was feeding the baby .. then you also told me about the positions that were actually very helpful because I had a C-section..so..ah.. you know I was not ..I was not comfortable in feeding the baby..in al the in all the positions and I was not sure if I can lye down or I can turn like this and give ah... if the baby will be comfortable or I will be comfortable so it was nice when you actually showed me how exactly you should help the baby latch..and what are the comfortable positions..and also you gave me you know.. you showed me how ..you gave me the tips regarding the diaper change ..you



know.. I thought we should apply the diaper cream only when there is rash but you said as a protective barrier you can do that .. and it was very good.. so ya..a lot of information like that (midwife was saying huh when mother was speaking)..

MW: ya.. so it helps you to prepare better for the motherhood..ya

M: ya ya .. and after that home visit my efficiency almost increase almost to 80%

MW: wow

M: that one day home visit until before that my confidence level or you know my adjustment level.. my knowledge level everything I can rate it as 20% which I learn from the hospital

MW: that's right ..

M: ok.. and ..ah.. you come home you already so tired you know..you don't have time to search the internet.. and internet is a huge database.. multiple opinions so confusing so tiresome and you just came.. you answer simply whatever I want and then you also told me every week its going to be a call so I never use to go to internet and you know confuse myself..lot of headache

MW: that's right

M: so I will just note it down..I will call you and I will get the answers.. you you were like a Google for me

MW: (laughed) wow so nice to hear that

M: so you know I can I can say from 20% that one home visit 80% ..k

MW: wow

M: and you know when I when you call me on the third week .. third call

MW: yes. Yeah yes.. third call

M: ah.. I mean I think I told you how am I speaking I mean don't you think I am so confident

MW: I totally agree ..I had seen the difference

M: I mean I was like 100%

MW: wow

M: so I knew I can do

MW: wow

M: you know.. I didn't have the feeling..ok..I am the first time mother..its not like that.. I already knew everything (mother laughed)

MW: that's so great to hear.. so can I say that it has helped like you say from 20% your confidence level increased to 80% just with one home visit

M: home visit ya ya

MW: and you then by third phone call you felt like I am 100% in my confidence level

M: because at home visit you know it it different from when parents tell friends tell because they tell out of their experience.. but when the professional tells.. because you have seen so many patients there .. right..now parents you know they have lot of ah.. myths also which they believe its fact and they tend to .. you know they ask to do this you do they they don't know the scientific reason behind it.. and then what ah in fact you know my mother will can.. my mother can say something my mother-in law can say some other thing

MW: laughed huh hu

M: you know ..I mean its my friends experience its like you know even the mother say something.. mother-in law say something..and.. its more confusing and you are more scared to implement that also because you feel in this situation in this environment ah.. and especially I want to tell this point I am staying in Singapore from two years...ok..so..ah.. now I have to refer to some Singapore doctor .. so some kind of practices which my Indian friends or Indian friend's moms or my mother-in

law they communicate on phone.. I am scared to do that.. because incase anything happens and then I go to a Chinese doctor here they might not correlate to what...

MW: the practices

M: and then they they might scold me how can you do tis and all that..so I was you know.. I was very scared to follow everybody's advice...so when a professional comes and say you know that experience.. that knowledge they have seen thousand and one moms.. you tend to believe and you tend to take it easy and believe them just follow that so you know tension is reduced.

MW: wow that's so wonderful so you felt that having a .. hearing from professional it actually allay your anxiety that I am actually follow someone who I can trust

M: ya yup trust.. true..that is the one

MW: ya..and ok..can I know a bit about.. do you think after participating in this programme.. do you feel that your social support was better and you were asking ah..more help from the others .. ah.. you were seeking help from your.. people around you.. do you did you did you start feeling that it is normal..

M: ya ya..ya .. I .. true.. I felt..ah.. instead of trying to be a super mummy (mother laughed) you know.. trying to do everything by yourself..getting confused, getting tired ..you its better to discuss it with people whom you can trust.. people whose knowledge you can trust

MW: huh hu

M: ok.. if you.. I I feel you know if you want help.. you can ask.. there is nothing wrong in this..

MW: huh.. very good.. so you felt ..its great to be more open.. its good to communicate.. huh

M: communicate.. ya..that's true

MW: that s good.. and how about your mood.. do you think participating in this programme has helped you somehow.. in alleviating your moos or.. or making you little bit less stressed.. you think that

M: ya (mother laughed).. I mean a lot more less stressed you know.. ah.. I feel once you know everything.. once you get the information from the trustworthy source ... so you don't have to the extra homework of finding out the right things to do..because you know what you have to do.. you know weather you are right or wrong from a professional help.. I mean the the knowledge base is very trustworthy so obviously you are not in any kind of stress.. so all that energy you can actually concentrate and taking care of your baby..

MW: huh..wow

M: see when you are stressed you now you cannot give quality care to your baby.. you are like.. you put the baby.. and you go and sleep .. your baby is awake also you are too tired and stressed out... but when you have less stress... you know you can play with the baby more... you know that the quality of that bonding with the baby it increases immensely..ah..I mean ah.. you you just don't want all the time go and sleep and take rest.. you feel more like watching the baby.. and you know playing with the baby..because.. you..ah

MW: your mood is better

M: ya.. your mood is better..its good and you don't have stress

MW: wow..that's very wonderful to hear.. and if I bring your attention towards knowledge part...knowledge of looking after the baby and newborn care... do you think this programme has given you some head start .. I know you have mentioned quiet a fair bit of the stuff.. but something you would like to mention which has really helped you to improve your knowledge .. how this programme has helped you...

M: ya...actually you know.. you gave me a book...you gave me a book I remember...so.. ah.. what happened I guess somewhat around third week..

MW: ok

M: you know I just felt that the baby was all the time drinking milk..and I was always thirsty always hungry...you know so much of feeding.. I felt the baby was hungry and I was getting confused because you cannot measure the amount of breast milk your body is generating.. unless and until you manually. I mean ..

MW: you see it.. ya... express it

M: you see it.. ya.. express it..I was like I was not generating sufficient milk or what is wrong with the baby and all that and then I go and open your book and you say.. you mention growth spurt..I remember.. than I was like ok.. (both mother and midwife laughed) .. this is something natural.. so just chill..you know just relax .. nothing wrong with your body.. your body is producing the milk..nothing wrong with the baby.. the baby is.. the digestive system is proper...its just a you know the growth spurt.. so like this.. I mean its just one example..like this a lot of information is there in that booklet.. you know al.. I think it I some ah.. 37 pages or 44 pages of book...you know.. it's a small book but contains a lot of things...and you know.. ah.. the English in the book is so simple.. its not boring..it like you open it.. when you are feeding your baby..you can just read the book..cool.. its not that that the book is so technical that you know.. you need to open the dictionary and then find out the meaning nothing like that .. you know..(midwife and mother laughed).. just feed the baby..and take the book...and you know..

MW: so it's a easy read

M: very easy read

MW: and was there...ah.. did you find it colorful the pictures and all that.. did it help you to see

M: ya.. I guess that's another kind of stress buster you know seeing colorful images

MW: ya that's right..

M: it's its not so monotonous just read like a manual you know.. like like some technical journal.. it was not like that you know with (midwife was saying ya when mother was speaking) .. I feel with the pictures it was more nice the book

MW: huh hu.. that's that's very nice to hear.. you are giving me very very great insights about your experience about the booklet ( mother laughed).. and is there anything particular you would like to say other than growth spurts you found.. is there any particular chapter in the book.. which catches your ah..attention.. was it.. ah.. if you remember..

M: I feel ..ah.. you know.. ah.. the book specifically mentioned.. it was not like how to take care of the baby alone.. it was you know how to take care of the mother also.. its not the focus is baby baby baby for the baby.. it was not like that like baby is an individual you are a individual it's a bonding.. you take care of yourself.. you take care of the baby.. and and if you you have a family around you know..you communicate.. get their help.. I mean create that teamwork that kind of thing..and also you know it.. it it it gave points on how the fathers can you know bond with the baby so that was more nice you know.. (midwife was saying ya when mother was speaking).. it was very nice you know the the part which you mentioned about the fathers.. you know they will be so proud to read that (mother and midwife laughed) they wouldn't have known you know they can help the mother in such a way .. actually most of the fathers they don't know that if they just encourage the mom a little bit you know.. how far the mother can go.. that information you know you

provide to the fathers..you tell them ah.. you have let them know that you just you have to appreciate what your wife is doing and that is enough for them..

MW: wow..

M: and you know and I think I remember this part when you told that the daddy should take care in ah.. baby care activities..

MW: ya..that is right

M: ah.. that is not something un-manly..this infact you know very good opportunity to bond with the baby..that was the really beautiful part.. because this is the truth.. it is a truth.. its not like you take care of the baby or wasting time nothing like that..and my husband enjoys giving bath to Shivani (baby name)..

MW: Oh that's so nice

M: so it is like I am there and bonded very well.. so I feel you know the father's contribution, which you have mentioned, is so important and vital you know for the baby as well .. the baby feel so comfortable with the father and the mother in the same way.. so as a family you have given information you know.. how entire family can nourish the baby..and all in that one booklet (mother laughed)..this more good

MW: thank you thank you that's very nice to hear.. and can I know for example I mention you earlier postnatal psychoeducation programme ha three parts in it..one is the home visit, the booklet and then the phone follow-ups.. do you feel that one thing is more important than the other or you think this programme should be combination of these three components..

M: no I feel you know it should have the home visit, the booklet and the the phone calls because the home visit you know.. home visit actually it's a professional help.. so any mother know... as as I said from 20% of confidence level know immediately from that one day my confidence level increase to 80% because you believe to tend to

trust the person who has knowledge on this.. who is a professional..and then booklet you know.. every time you you don't want to call or you don't want to find the information in the net and because it is also tedious when you are already handling the baby..ah.. just open the book, read it and it's done.. and phone calls especially because as and how you are travelling through the journey you get a lots of doubts..so you know the real time doubts..for that the phone calls is really helpful

MW: excellent

M: ah.. any doubts I had.. I will just make a note of it and I will just call you and finish it of and when ever you call you know I just ..

MW: right.. ya.. take a note... and whenever you know its gonna be next weekly phone call and then you will ask your questions (mother was saying ya, yes when midwife was speaking).. that's good.. so can I say bringing help to your home environment was it beneficial

M: oh true.. otherwise you know how many times I should search for (mother laughed) a professional.. you know I have to travel with this baby.. I I won't have travel actually.. because travelling with baby is actually very difficult (mother laughed).. so going and seeking a professional help taking your baby and every time I cannot get my husband to take leave and you know its very difficult taking an infant and travelling so home visit is like really good..

MW: really good ya.. alright that's good and do you think participating in such programmes it's a waste of time or do you think

M: no no not at all (mother laughed) I feel its its like a boon for me especially in my case when I don't have any elders to assist or any friends or.. only me and my husband and I cannot get him to take leave and sit with me everyday in the home so I



mean it is not practical too..so I feel you know this was like a boon for me.. I only hope.. it it benefits lots of mothers (both mother and midwife laughed)

MW: that's that's what you say what I wanted to say next .. do you think such programs should continue and it should reach to the more mothers..

M: you know very very obviously (mother and midwife laughed).. I a sure many mothers would have told the same thing..because.. I just feel you know..how miserable my situation could have been incase this part was not there so imagine how many mothers would have suffered like me..and you know how I am how many mothers can benefit... so I feel this should expand to a large scale and reach out to many people and it is good when you know when mothers are happy babies are happy (midwife was nodding, saying ya, huh and wow when mother was speaking).. the quality of baby care increases so babies can grow as more smart individuals you know..

MW: I can see that you have read the book (mother laughed).. very good (both mother and midwife laughed)..you understand the how important the motherhood is and how important is your confidence level in looking after the baby.. that's very nice (both mother and midwife smiled)..great!! and how about Geetha is there any way we can improve this programme further some suggestions you would like to..

M: ah.. actually I am very comfortable with the home visit and home visit I actually thought that it would have been better if it was provided I mean second or third day after I discharge from the hospital..but then you know.. I feel four days gap is ok.. because three four days you..ah..if you immediately come and visit me I wont have any questions to ask..

MW: exactly.. yes..

M: so 3-4 days was fine.. then I knew what exactly I needed to know I needed to ask.. so I feel ah.. and online chat would have been ah.. will be very helpful .. you know everytime you you are not comfortable calling ..you you are not sure if the other person is free to answer your calls.. so if a 24 hours you know online chat is there. So anytime you have a doubt

MW: you can log in and..

M: ..you can get the answers immediately

MW: excellent

M: .. so any kind of you know on line chat support through mobile applications also can help you know.. because you can easily handle your mobile.. just log in ..pose the question and ..because on the on-line chat you know the other person is sitting to answer your query.. but in phone call I am not sure if the other person is free or not...so 24/7 support would be good

MW: that's wonderful

M: ..even if it is a telephone support it is ok.. but chat is more comfortable than the telephone support..telephone you have to dial wait in the IVR you know you have to hold the phone..online is like you know sit in front of the system and you know just log in and the answer is already come read it and .. more less less noisy and more convenient

MW: more convenient .. so if I summarize on your suggestions.. you mean you are happy wit the timing ah.. for the home visit.. it was appropriate you feel..and you feel the booklet was good.. you feel the phone visits were appropriate and ..(mother was saying yes, ya when midwife was speaking)

M: .. and if I have to rate 5/5 ah.. I mean I would have rated 5/5 for everything (mother and midwife smiled)

MW: thank you so much about that so it's a good suggestion you have given that it will be nice if we have some on-line chat forums for the mothers so that they can leave the questions for us.. and then we can get the answers as the persons ah ah the answers been answered by the professional ya

M: yay a true..

MW: that's that's a very good thing you have mentioned actually

M: thank you (mother smiled)

MW: so before I I ah.. we rap up the session and end this interview is there anything you would like to share with me ah..about this programme you would like to reach it to many other people..how

M: ya ya ya..truly.. I want everybody to enjoy what I enjoy (mother laughed).. everybody to get the assistant what I have got because I know what it is to become a first time mother its like you know.. its not how they show in movies you know just become a mother and then you carry a the cute baby (mother laughed) and roam around.. its not like that.. it has the lot of things behind.. so you know I I would really appreciate if this reaches as many mothers as possible..

And one more thing you know I would I had .. more than me my husband is happy because you know of.. from his part also it is not so easy having a new baby and then you know first time ah.. wife is the first time mother so she will not know everything you know .. no elders to support..obviously he also has some kind of tensions you know .. how my wife will do.. is she comfortable..then keep calling from the office you know how you doing... I mean.. but for my husband you know almost 80% (mother laughed) of the tension is not there its like because you know he knows that I am doing well..

MW: oh that's so good to hear

M: in fact initially there was any doubt he had he would come and note down in a notebook and he will come go ask shefaly.. (midwife laughed) so even more than me my husband is happy..

MW: wow..so you benefit as a couple as a family

M: ya as a family

MW: wow its so good to hear .. wow.. this is really wonderful hearing from the mom who has benefited from the programme and honestly it's a equal ah.. its it's a both way communication ..I enjoyed.. and I feel very contended facilitating such sessions.. so it's beautiful to know from you.. so is there anything you would like to say before we end this session?

M: ah.. yes.. I would like to say thanks thank you and thank you again.. you were really wonderful , convenient comfortable (both mother and midwife laughed) , easy to speak with and..it was awesome

MW: thanks thank you I really appreciate your time Geetha and and I wish you all the best for your future..ya

M: thank you so much shefaly and I wish you all the luck you know just try to expand this programme as much as ...as early as possible to many people an be benefited

MW: thanks thank you so much .. thanks a lot Geetha

M: Thank you (mother smiled)

## Legend for the Color Coding

Colors for Initial Coding	Subthemes (Categories)	Themes
Orange	Negative Emotions	Challenges of Postnatal Period
Light Green	Difficulties in Breastfeeding	
Red	Lack of knowledge in Newborn care	
Green	Support Issues	
Maroon	Enhanced Confidence Level	Benefits of Participating in PPP*
Teal	Enhanced Help-seeking Behaviour	
Pink	Enhanced Emotional Well-being	
Blue	Enhanced knowledge on Newborn care, Self-care & Breastfeeding	
Light Pink	Convenient & Helpful	Strengths of PPP*
Light Blue	Establish Trusting Relationship with the Midwife	
Dark Green	Comprehensive Educational Booklet	
Dark Purple	PPP* as Routine Care	Future Directions
Turquoise	Web-based Learning	

\* PPP-Postnatal Psychoeducation Programme