EFFECTIVENESS OF COMPREHENSIVE PRETERM INFANT DEVELOPMENTAL CARE PROGRAM ON PARENTAL SELF-EFFICACY, GROWTH AND NEUROBEHAVIORAL DEVELOPMENT OF HOSPITALIZED PRETERM INFANTS

WARUNEE MEELAI

A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR DOCTOR DEGREE OF PHILOSOPHY
(INTERNATIONAL PROGRAM)
IN NURSING SCIENCE
FACULTY OF NURSING
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2022

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ดุษฎีนิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปรัชญาดุษฎีบัณฑิต (หลักสูตรนานาชาติ)
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The Dissertation of Warunee Meelai has been approved by the examining committee to be partial fulfillment of the requirements for the Doctor Degree of Philosophy (International Program) in Nursing Science of Burapha University

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WARUNEE MEELAI : EFFECTIVENESS OF COMPREHENSIVE PRETERM INFANT DEVELOPMENTAL CARE PROGRAM ON PARENTAL SELF-EFFICACY, GROWTH AND NEUROBEHAVIORAL DEVELOPMENT OF HOSPITALIZED PRETERM INFANTS. ADVISORY COMMITTEE: CHINTANA WACHARASIN, Ph.D., PORNPAT HENGUDOMSUB, Ph.D. 2022.

Even after being treated in the neonatal intensive care unit (NICU), preterm infants are an especially vulnerable population that requires specialized care to promote their growth and development. The purposes of this mixed-method design were to develop the Comprehensive Preterm Infant Developmental Care (CPIDC) program and test its effects on parental self-efficacy, growth, and the neurobehavioral development of preterm infants during hospitalization. Purposive sampling was used to recruit participants for the qualitative approach (n = 10) and randomly assigned 46 voluntary dyads of parents and preterm infants to the experimental (n = 23) and control (n = 23) groups for the quantitative approach. Data was collected in Chon Buri hospital from April 2021 to January 2022. The experimental group received the CPIDC program, which consisted of four sessions over one week, and the usual care, while the control group only received usual care. The digital weight scale, measuring tape, Neonatal Neurobehavioral Examination (NNE) scale, and the Perceived Maternal Parenting Self-Efficacy (PMP S-E), were among the research instruments used to collect data. The inter-rater reliability of NNE was .93. The Cronbach's alpha reliability of the PMP S-E was .94. Content analysis, descriptive statistics, the chi-square test, the Fisher exact test, the independent t-test, and two-way repeated measures ANOVA (one-between and one-within) were used to analyze the data.

From the qualitative perspective of parents, the findings revealed that collaborative participation was the key to success in promoting parental participation in the developmental care of preterm infants during NICU hospitalization. The experimental group had significantly higher mean scores for neurobehavioral development, head circumference gain, length gain, and parental self-efficacy than the

control group ($F_{1, 44}$ = 16.155, p < .001; $F_{1, 44}$ = 6.125, p < .05, $F_{1,44}$ = 8.165, p < .01; $F_{1, 44}$ = 6.070, p < .05, respectively). However, there was no significant difference in mean scores of weight gain ($F_{1, 44}$ = 3.631, p >.05), but there were significantly higher mean scores of weight gain velocity and growth velocity than the control group on the 28th day from 14th day = 2.407, p < .05 and t = 2.291, p < .05, respectively). The experimental group had significantly higher mean scores of neurobehavioral development, growth, and parental self-efficacy at the 14th and 28th days than at the baseline. This program demonstrated statistically significant enhancements in preterm infant neurobehavioral development, growth, and parental self-efficacy in the short term. Therefore, it is recommended that this program be implemented in the NICU.

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CHAPTER 1
INTRODUCTION

Statement and significance of the problems

Preterm birth or birth before week 37 of gestational age is challenging for both infants and their mothers. Apart from a high risk for morbidity and mortality, preterm infants may also have a greater risk for neurodevelopmental disabilities. Every year, approximately 15 million infants are born prematurely, accounting for more than one in every ten infants worldwide, and this number is rising. Globally, prematurity is the leading cause of death in children under the age of 5 years. According to the data of WHO (2018), preterm birth rates are increasing in almost all countries. In Thailand, a high incidence of preterm birth, with birth weights ranging from 500 to 2500 grams, was found accounting for 10 percent of all childbirths in the country (Ministry of Public Health Thailand, 2021).

The advancement of medical technology and nursing care increases the survival rate of preterm infants. However, those who survive are at a high risk for health problems (e.g. neurobehavioral development disorders) due to immaturity of vital organs and require special care in the neonatal intensive care unit (NICU). According to preterm infant morbidities, their parents also experience extreme stress, fatigue, helplessness, poor parent-infant interaction, knowledge deficits, depression, and anxiety (Chertok et al., 2014; Jubinville et al., 2012).

During the last trimester of pregnancy until the gestational age in week 40, it is a period in which the infant's brain constantly develops in both quantity and quality. Brain development in fetuses, newborns and infants includes sensory, motor, social/emotional and cognitive systems, which are connected and integrated during development. The mother's uterine environment promotes positive sensory experiences, which are necessary for normal brain development in developing fetuses. The uterine environment protects the developing fetus from intense external stimulation while also providing tactile, vestibular, chemical, visual, and auditory stimulation that is integrated in a multimodal fashion (Lickliter, 2011). The growth of various neurons within the brain is interrupted and forced to occur under the

influence of stimuli that do not exist in uterine environment if the infant is born prematurely (Ullenhag et al., 2009).

Preterm infants' exposure to fluctuations in temperature, touch, vestibular and gustatory sense, olfaction, noise, light, oxygen, and nutrients is a very different experience from what they have faced while being in utero. These negative sensory inputs replace positive sensory inputs influencing brain development and leading to permanently altered abnormal brain development (Altimier & Phillip, 2013). Additionally, preterm infants are also at high risk for a variety of developmental problems including cognitive deficits, behavioral disorders, motor impairments, visual problems, hearing loss, attentional deficits, and social, emotional, and educational problems. There is an evidence supporting that developmental problems are related to continual development outside of normal uterine environment (Adam-Chapman et al., 2018; Anderson et al., 2016; Ditzenberger et al., 2016; Kenner & McGrath, 2012; Marlow et al., 2014; Moore et al., 2018; Neil & Inder, 2018; Symes, 2016). Indeed, previous epidemiological studies have discovered that more than 25 percent of infants born between week 28 and 32 of gestation have neurodevelopmental disabilities such as cognitive, motor, visual or hearing deficits at the age of two, and this proportion increases by 15 percent to 40 percent at the age of ten (Johnston et al., 2014). Infants born before week 32 of gestation are three times more likely to develop psychiatric disorders than full-term born infants (Johnson & Marlow, 2011), and can be at a higher risk for various sociocognitive impairments (Blencowe et al., 2013; Spittle, 2016; Synnes & Hicks, 2018).

The infant's brain grows significantly while in the NICU between week 24-40 of gestation (Aita et al., 2017; Pickler et al., 2010). A series of multiple neurological events occur such as the creation of synaptic and neuron connections as well as the proliferation of essential structures, namely, thalamus, cortex, and cerebellum. All are at risk for external and internal experiences (Volpe, 2009). It has been agreed that factors related to the NICU which influence preterm infants' neurodevelopment during hospitalization are, among others, environmental stimulation, parent-infant interactions, caregiving experiences, and nutrition intake (Aita et al., 2021; Cormack et al., 2019).

Environmental stimuli from the NICU are classified as environmental factors affecting preterm infants. Potentially dangerous stimuli such as bright lights, loud noises, frequent disturbances, and specific painful medical procedures have an impact on preterm infants. The reactions of preterm infants to harmful stimuli influence both short- and long-term outcomes of growth and development (Sullivan et al., 2012), particularly for neurobehavioral developmental problems (Braga & Sena, 2012; Schlapbach et al., 2012). For noise levels in NICUs, physiological effects of loud transient noise include increased heart and respiratory rate, higher blood and intracranial pressure, more oxygen as well as apnea and bradycardia (Wachman & Lahav, 2011). Furthermore, loud noise has a negative impact on neurobehavioral development such as hearing impairment, neuropathological changes in central nervous system including regional brain volume reduction, white matter microstructure abnormalities as well as abnormal cognitive development and reduction of language skills (Olejnik & Lehman, 2018). Preterm infants' visual development and sleep disturbances are also affected by intense light exposure (Altimier & Phillips, 2013). Sleep disturbances in preterm infants can have a negative impact on clinical outcomes of growth and development, and may even lead to lengthy hospitalizations. Sleep quality is essential for brain development and synaptic plasticity and linked to long-term neurodevelopmental outcomes (Park, 2020). As a result, light and sound levels in the NICU should be controlled so that the latter should not exceed 45 decibels, while the former is within the range of 1–60 foot candles or at least 10 to no more than 600 lux (Almadhoob & Ohlsson, 2020; White et al., 2013).

Nutrition is a significant factor affecting neurodevelopment and growth of preterm infants. Adequate amounts of macronutrients and micronutrients are required for normal brain development in preterm infants, while better nutrition in the first postnatal weeks has the potential to improve neurodevelopmental outcomes (Cormack et al., 2019). Improved neurodevelopmental outcomes, including language scores in very low birthweight (VLBW) infants, have been associated with increased energy and macronutrient intake in the first postnatal weeks (Shim et al., 2014). Growth velocity during the NICU hospitalization of extremely low birth weight infants exert significant and possibly has independent effect on neurodevelopmental and growth at the age of 18 to 22 months (Ehrenkranz et al., 2006). Breast milk is the best

source of nutrition for preterm infants because it provides nutrients to support rapid growth and development as well as a proper unique lipid profile and protein fraction for infants' neurodevelopment (Belfort, 2018; Moro & Arslanoglu, 2020; Kim, & Yi, 2020, Volpe et al., 2017).

Furthermore, the NICU's environment also affects preterm infants' growth. Protein accumulation and a lack of energy are observed in preterm infants in the NICU during their hospitalization (Mariani et al., 2018). A tolerance of enteral nutrition and nutritional intake is associated with preterm infants' weight gain (Steward, 2012). The period from birth to 28 days of life is a golden period for preterm infant growth (LaHood & Bryant, 2007). The third to fourth week of life is the most critical period for their growth. Their tardy growth and poor postnatal growth are associated with changes in neurodevelopmental outcomes during hospitalization (Ong et al., 2015; Rozé et al., 2012). Promoting their growth during the NICU stay in the first month of life is therefore very essential because it is associated with better neurodevelopmental outcomes in their later stages of growth (Belfort et al., 2011).

The caregiving experiences and parent-infant interactions are another significant factor influencing preterm infants' neurodevelopment during hospitalization. During their time in the NICU, most preterm infants' neurosensory development is overstimulated as a result of their caregivers' experiences. The environment in the NICU is an inappropriate stimulation to support and enhance neuronal development. These stimulations include regular change of caregivers, medical procedures dictating touch and handling, and little care based on infant cues (Pickler et al., 2010). Preterm infants in the NICU have the potential for maladaptive development (Als & Butler, 2011) because they are unable to tolerate sensory overstimulation due to their immature central nervous system (Altimier & Phillips, 2013). This results in their development permanently deviating from the normal process of neurobehavioral development (Rees et al., 2011). Preterm infants who have received care based on their neurobehavioral capabilities, according to Buehler et al. (1995), are more able to calm themselves and better organized in both motor and autonomic regulation as well as have better self-regulation. Therefore, providing interventions that reduce inappropriate stimulation may result in normal neurobehavioral development of preterm infants.

Parent-infant interaction has been identified as a factor influencing the neurodevelopment of preterm infants. During their hospitalization in the NICU, preterm infants are separated from their parents leading to limited interaction with them. The ultimate goal of ensuring neurodevelopment supported by usual standards should be zero separation from parents, not just preventing effects of toxic stress (Boykova & Kenner, 2010). The mother-child interaction has a significant impact on brain development including brain structure and function (Altimier & Phillips, 2016). Tactile stimulation between mother and infant contributes to the increased of maternal response and infant attachment (Mateus et al., 2021; Hofer, 2006). A small subcortical gray matter volume is associated with lower maternal sensitivity (Sethna et al., 2017). When the quality and/or quantity of parental care for infants is limited, such as in the case of preterm infants in the NICU, these unwanted experiences can lead to adverse changes in brain structure and function (Altimier & Phillips, 2016).

Besides that, the relationship between parent-infant attachment and developmental outcomes is well established (Magill-Evans & Harrison, 2001; Treyvaud et al., 2009). When parents in the NICU hold their infants and learn how to identify and respond to the infant's needs, the parent-infant relationship is created and developed (Feldman et al., 2002; Heermann et al., 2005; Skene et al., 2012). The presence of parents and infants in the NICU is associated with better neurobehavioral outcomes at term equivalent age (Reynolds et al., 2013). Parental participation and presence in the NICU and infant holding can promote useful feelings and improve attachment. While being hospitalized in the NICU, parents can provide appropriate, meaningful sensory stimulation and human skin-to-skin contact to help improve their infant's stress coping ability (Altimier & Phillips, 2013; 2016; Castral et al., 2008; Gray et al., 2004; Johnston et al., 2003; Ohgi et al., 2002; Pineda et al., 2021).

Skin-to-skin contact has been associated with decrease acute pain response, weight gain, improved infant growth and development, decreased hypothermia, earlier discharge, and better cognitive outcomes in childhood. It also promotes interaction and assists fathers in attachment, confidence, caregiving, and interactions with preterm infants (Altimier & Phillips, 2016; Deng et al., 2018; Pineda et al., 2018). Furthermore, a high rate of maternal participation in the NICU is associated with excellent cognitive and linguistic outcomes in childhood (Lester et al., 2016). As a result, parents

play a significant and beneficial role in promoting preterm infants' appropriate growth and neurobehavioral development. The parent-infant relationship also enhances parental confidence in providing care for their preterm infants.

Individualized developmental care concepts are frequently applied in the NICU. This concept is defined as the protection of neurodevelopment for preterm infants against the extrauterine environment and encompasses a wide range of thoughts and interventions (Burke, 2018). It describes activities performed by nurses to reduce excessive environmental stimuli (Altimier & Phillips, 2013; 2016). There are many care guidelines for promoting the development of preterm infants, and the most widely used concept is based on the synactive theory of development (Als, 1982). Synactive Theory of Development (Als, 1982) that identifies five distinct but interdependent subsystems (autonomic, motor, state, attention-interaction, and self-regulation) within the infant is a framework for understanding infant behavior. Those subsystems are in constant mutual interaction (the neonate's internal functioning), the environment, and caregivers. Infants continuously communicate their level of stress and stability about what is going on around them through a recognizable approach and avoidance behaviors that occur in subsystems. Based on the idea that infants are constantly interacting with the environment, each infant will respond to the world around them. Therefore, interventions aimed at sustaining or modifying these NICU factors during preterm infants' hospitalization should promote optimal neurodevelopment of preterm infants.

According to existing studies from systematic reviews of neurodevelopmental care interventions, the effectiveness of interventions provided during the NICU hospitalization includes developmental care interventions, namely, positioning, clustering of nursery care activities, modification of external stimuli, and individualized developmental care interventions (Symington & Pinelli, 2006), NICU noise reduction (Almadhoob & Ohlsson, 2020), skin-to-skin contact (Conde-Agudelo & Díaz-Rossello, 2016), and early intervention related to parental participation or involvement in their infant's care (Yu et al., 2019; Vanderveen et al., 2009). Parental participation in the NICU can reduce stressful exposures. Facilitated tucking, breastfeeding, and skin-to-skin care have been shown to decrease stress and pain experienced in this population (Castral et al., 2008; Cignacco et al., 2007; Liaw et al., 2012). Parental engagement in the NICU could optimize brain development (Pineda et al., 2018). The findings

indicated that some programs could improve preterm infant growth and neurobehavioral development, while others could improve parent-infant interaction. However, there is no program that could promote parental participation, increase parental confidence, and enhance preterm infant growth and neurobehavioral development all at once.

Moreover, most of the programs were developed in other countries, which may not be suitable for the Thai context. Preterm infants who require intensive care are frequently hospitalized for weeks, if not months, which brings to the forefront the importance of policies and practices that minimize parent-infant separation in the NICU. Phatthanasiriwethin (2001) identified that some mothers have declined to interact with their preterm infants. At their first visit to their preterm infant, mothers did spend a short period of time (only 2–5 minutes). According to Pholanun et al. (2013), 63.6 percent of mothers reported that they have a moderate level of participation in their preterm infant's care in the NICU. Thai mothers with high-risk newborns need to be more involved in their infant's care than they currently are. Furthermore, the mean scores for perceptions of mothers and nurses were significantly different (Paesakun & Thanatthirakun, 2010). The findings of the previous study revealed that Thai parents wished to be close to their preterm infants but they had no confidence in providing care for their preterm infants. They also trusted in the capability of physicians or nurses and health care professionals who had greater expertise in infant's physiologic status and care needs (Sarapat et al., 2017). Parental involvement in providing care for hospitalized preterm infants is critical to infant care quality. Due to the parents' unique expectations, attitudes, and perceptions about such participation, nurses must effectively assess their needs and provide appropriate information and support based on mutual partnerships.

Furthermore, according to systematic reviews of neurodevelopmental care interventions, the intervention components are classified into three categories, namely, 1) parent education: teaching, sensitization, training, or awareness creation; 2) parent psychosocial support: guidance, encouragement or other forms of support; and 3) infant support/therapeutic developmental interventions: infant care or therapy elements (Benzies et al., 2013; Brecht et al., 2012; Brett et al., 2011; Burke, 2018; Puthussery et al., 2018; Vanderveen et al., 2009). These three components are critical for improving parental and preterm infant outcomes. Nonetheless, few studies include all three critical components in the intervention to measure parent

and infant outcomes. According to Burke (2018), parent education is an essential component of all interventions. The first priority is to educate parents and promote their involvement in developmental care needs in the most effective and efficacious way possible. However, there is no study that examines or discusses the parents' confidence or ability to provide intervention care, which potentially compromises the validity of studies (Burke, 2018).

Preterm infants are viewed as less rewarding social partners and display less responsive behavior in parent-infant interactions than term infants. As a consequence, parents of preterm infants may have more difficulty developing a sense of mastery and self-efficacy in relation to parenting tasks (Pennell et al., 2012). According to Bandura (1997), maternal beliefs about her effectiveness in performing and managing a variety of tasks in parenting roles are the key to her self-efficacy. Maternal self-efficacy in her parenting ability can predict long-term outcome of mother-infant relationship, neurodevelopment, and behavioral development of at-risk infants (Aarnoudse-Moens et al., 2009; Jones & Prinz, 2005; Melnyk et al., 2001). Promoting parental self-efficacy in parents of preterm infants is very important because preterm infants require constant care under parental supervision to promote their growth and neurodevelopment once being discharged from the hospital (Wangruangsatid et al., 2019). Furthermore, mothers have been the persons of the majority of studies on parental reactions to a preterm birth and NICU admission. Unfortunately, the current evidence base shows that fathers' emotional responses and needs are minimal. In the NICU, fathers are frequently the first point of contact. In this context, he is frequently left alone and may exhibit mental health issues such as depression or anxiety. As a result, it is critical to involve fathers in the care of their infants in the NICU and at home in order to improve fathers' support and confidence in their role in the NICU (Baldoni et al., 2021). Therefore, a comprehensive intervention program consisting of three critical components to foster parental self-efficacy, preterm infant growth, and neurobehavioral development should be developed and tested.

There is only one study in Thailand that uses developmental care intervention to investigate the effects of a maternal participation program on preterm infant growth and neurobehavioral development. The findings revealed significantly greater growth

and improved neurobehavioral development (Namprom et al., 2018). The only single intervention that measures all neurodevelopmental dimensions in preterm infants is the comprehensive intervention specifically designed for parental participation in providing care for preterm infants; however, currently, there is no such intervention in Thailand. The new intervention should be applied to promote parental participation in preterm infant developmental care while being in the hospital. Therefore, this study aims to develop and test the effectiveness of the comprehensive preterm infant developmental care program on parental self-efficacy, growth, and neurobehavioral development of preterm infants during hospitalization.

Research objectives

1. To develop comprehensive preterm infant developmental care intervention.
2. To compare mean scores of preterm infant growth between infants receiving the comprehensive preterm infant developmental care program and those treated with usual care at post-test, and follow-up.
3. To compare mean scores of preterm infant growth of preterm infants receiving the comprehensive preterm infant developmental care program in pre-test, post-test, and follow-up
4. To compare mean scores of neurobehavioral development between preterm infants receiving the comprehensive preterm infant developmental care program and those treated with usual care at post-test and follow-up.
5. To compare mean scores of neurobehavioral development of preterm infants receiving the comprehensive preterm infant developmental care program at pre-test, post-test, and follow-up.
6. To compare mean scores of parental self-efficacy between parents receiving the comprehensive preterm infant developmental care program and those receiving usual care at post-test, and follow-up
7. To compare mean scores of parental self-efficacy of parents receiving the comprehensive preterm infant developmental care program at pre-test, post-test, and follow-up.

Research hypotheses

1. Preterm infants receiving the comprehensive preterm infant developmental care program will have significantly higher mean scores of neurobehavioral development than those treated with usual care at post-test, and follow-up.

2. Preterm infants receiving the comprehensive preterm infant developmental care program, at post-test and follow-up, will have significantly higher mean scores of neurobehavioral development than those at pre-test.

3. Preterm infants receiving the comprehensive preterm infant developmental care program will have significantly higher mean scores of preterm infant growth than those treated with usual care at post-test and follow-up.

4. Preterm infants receiving the comprehensive preterm infant developmental care program, at post-test and follow-up, will have significantly higher mean scores of preterm infant growth than those at pre-test.

5. Parents receiving the comprehensive preterm infant developmental care program will have significantly higher mean scores of parental self-efficacy than those receiving usual care at post-test, and follow-up.

6. Parents receiving the comprehensive preterm infant developmental care program, at post-test and follow-up, will have significantly higher mean scores of parental self-efficacy than those at pre-test.

Conceptual framework of the study

The Comprehensive Preterm Infant Developmental Care Program (CPIDCP) was integratedly developed based on the synactive theory (Als, 1982), the Neonatal Integrative Developmental Care (NIDC) model (Altimier & Phillips, 2013; 2016), and related synthesized research evidences and contexts. The synactive theory (Als, 1982) provides the framework to conceptualize the organization of the neurobehavioral capabilities in the early development of the fetus, newborn, and young infants. The synactive theory of development also specifies the degree of differentiation of early infant development and provides the assumption that the infant actively and consistently communicates, through behaviors, his/her thresholds for sensitivity versus competence. The range of infant behaviors becomes evident as the

infant matures. This theory also identifies five separate but interdependent subsystems (autonomic, motor, state, attention-interaction, and self-regulation) within the infant. These subsystems are in constant interaction with each other (the neonate's internal functioning), the environment and caregivers. Moreover, this theory aims to promote the individual development of preterm infants, classifies behaviors into five subsystems, identifies preterm infants' signs of stress and adaptation, and suggests interventions to support preterm infants in the presence of signs of stress. When signs of stress are observed in preterm infants, it is crucial to intervene them for comfort and to promote the emergence of adaptation.

In addition, the NIDC model (Altimier & Phillips, 2013; 2016) provides clinical guidelines to promote neuroprotective developmental care intervention for preterm infants in the NICU with family-centered care involvement. Parents are the most important caregivers in an infant's life, and the central core neuroprotective intervention is partnering with families to provide developmental care for preterm infants.

According to previous research evidence, the effectiveness of developmental care intervention process can be classified into three components including parent psychosocial support, parent education, and therapeutic infant development support (Benzies et al., 2013; Brecht et al., 2012; Brett et al., 2011; Burke, 2018; Puthussery et al., 2018; Vanderveen et al., 2009). These three components are the essential aspects for improving parent and preterm infant outcomes. However, to develop parental self-efficacy, verbal persuasion (Bandura, 1977) from their family and coaching could persuade parents to successfully participate in the care of a preterm infant. Therefore, the new intervention should incorporate such research evidence into the intervention process, with the aim of increasing parental self-efficacy, promoting preterm infant growth, and enhancing neurobehavioral development.

The Comprehensive Preterm Infant Developmental Care Program (CPIDCP) in the current study has been developed with the following six stages divided into four sessions over one week. 1) The trusting relationship is created to build a trust between the researcher and the participants for establishing and maintaining the relationship as well as setting guiding goal based on the reality of parent

participation in preterm infant developmental care. 2) The parents are individually requested to participate in the study and to express their feelings about situation of providing care for their preterm infant to gain a deeper understanding of a context. At this stage, factors obstructing the preterm infant developmental care in the NICU, parents' feelings, perceived problems, and preterm infant cues are identified. 3) Parents are trained to enhance their confidence in preterm infant care by means of teaching, individual demonstration, practice as well as in and return demonstration of preterm infant developmental care, 4) Therapeutic infant development is promoted and supported as follows: a) creating a healing environment by minimizing the impact of the artificial extrauterine NICU environment on the infant's brain development to protect the development of sensory system of preterm infant, b) positioning and handling by providing mimic fetal position in the womb and supporting autonomic stability during handling activities, c) minimizing stress and pain to promote self-regulation in preterm infants and neurodevelopmental organization, d) safeguarding sleep and encouraging to support long periods of restful and uninterrupted sleep stage, e) protecting skin by maintaining the infant's skin integrity from birth to discharge and providing developmentally appropriate infant massage, and f) optimizing nutrition by promoting and supporting breast milk and breastfeeding. 5) Psychosocial support is provided for parents by making a time schedule of parental infant care and for reducing their stress. They are assisted, facilitated, and encouraged to engage in infant care. 6) The reflection and evaluation are conducted in order to observe and give a positive reinforcement and feedback to the parents' participation in preterm infant care. At this stage, parents are encouraged to give their feedbacks about their cognitive, affective and behavioral changes when participating in preterm infant care. The brief conclusion of conceptual framework is shown in Figure 1.

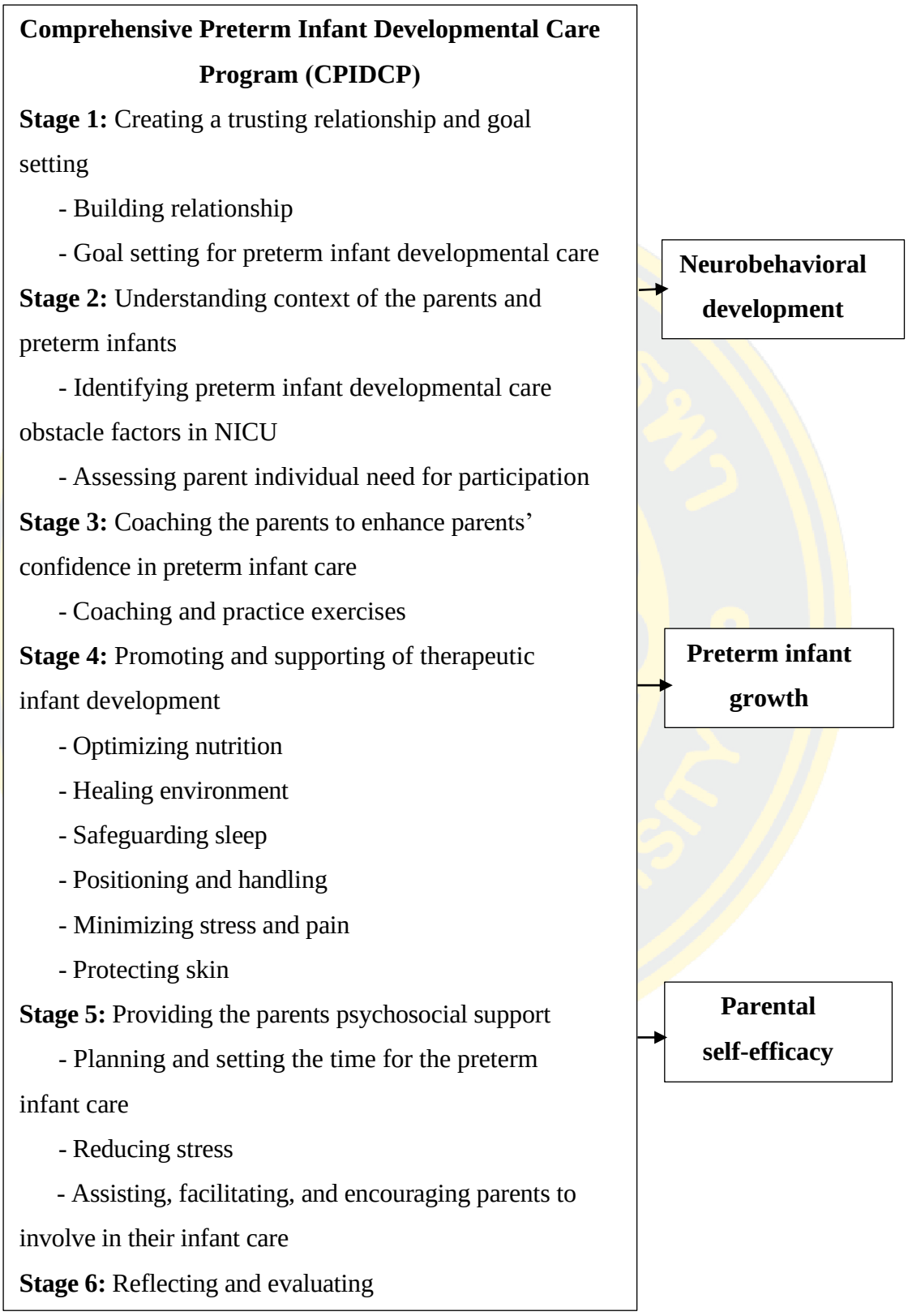

Figure 1 The study framework

Scope of the study

In this study, a mixed-method study design was applied, with a qualitative method to gain a deeper understanding of the context of parental participation in the preterm infant developmental care in the NICU, and a quantitative approach to test the effectiveness of the developed intervention. Therefore, the aims of this study were to develop and test the effectiveness of the CPIDC program on parental self-efficacy, preterm infant growth, and neurobehavioral development during hospitalization. The CPIDC program was conducted at the Neonatal Intensive Care Unit in Chon Buri hospital from April 2021 to January 2022.

Operational definitions

Preterm infant refers to an infant born at week 28-32 of gestational age, and assessed using the New Ballard score.

Preterm infant growth refers to the process of quantitative increase in physical size including changes of body weight, head circumference, and length of a preterm infant on day 14 and 28 of life.

Body weight refers to an infant's mass or weight measured while unclothed using digital weight scales in the gram unit. The body weight in this study was calculated in terms of weight gain, weight gain velocity, and growth velocity. Weight gain is the increase in weight, expressed in grams, by comparing between the initial and later weights over a specified period of time. The change in weight of an infant between two different time points in a unit of gram per day, and a unit of gram per kilogram per day is referred to as weight gain velocity, and growth velocity, respectively.

Head circumference is the occipital-frontal circumference (OFC), which is measured in centimeters by placing a measuring tape around the most prominent aspect of the frontal and occipital bones. In this study, the head circumference was calculated in terms of head circumference gain. Head circumference gain is the increase in head circumference in centimeters over a specified time period based on the initial and later head circumferences.

The length of a preterm infant refers to the length of the infant's body, which was measured in the centimeter unit from top of the infant's head to the bottom

of one of his/her heels using a measuring tape while being lying down. In this study, the length of a preterm infant was calculated in terms of length gain, which is defined as the increase in length in centimeters based on the initial and later lengths over a specified time period.

Neurobehavioral development of preterm infants refers to the distinct change in neurobehavioral function of preterm infants at a given conceptional age. The neurobehavioral development of preterm infant in the current study consists of following three attributes: 1) tone and motor patterns, 2) primitive reflexes, and 3) behavioral response. It will be measured by the Neonatal Neurobehavioral Examination (NNE) of Morgan et al. (1988).

Parental self-efficacy refers to parents' perceptions of their abilities to understand and provide care for their hospitalized preterm infants. It consists of following four attributes: 1) care taking procedures, 2) evoking behaviors, 3) reading behaviors, and 4) signaling and situational beliefs. It is measured by the Perceived Maternal Parenting Self-Efficacy (PMP S-E) of Barnes and Adamson-Macedo (2007).

Comprehensive Preterm Infant Developmental Care Program (CPIDCP) refers to the nursing intervention based on the synactive theory, the Neonatal Integrative Developmental Care Model, the synthesized research evidences, and perspectives of preterm infant's parents. This program will be implemented by a nurse in providing developmental care for a preterm infant and by the researcher in helping parents participate in preterm infant care. The CPIDCP aims to promote preterm infant growth, enhance neurobehavioral development of the preterm infant in the NICU, and increase parental self-efficacy. This intervention consisted of the following six stages divided into four sessions over one week: 1) building a trusting relationship and setting goals, 2) understanding contexts of parents and preterm infants, 3) coaching parents to enhance their confidence in preterm infant care, 4) promoting and supporting of therapeutic infant development, 5) providing parental psychosocial support, and 6) reflecting and evaluating.

CHAPTER 2
LITERATURE REVIEWS

The purpose of this literature review is to provide the reader with a general overview of several topics, including: 1) overview of preterm infants, including the definitions, classification, characteristics, and health problems, 2) preterm infant growth, including the growth of preterm infants in the NICU, growth assessment, factors affecting the growth of preterm infants, 3) neurobehavioral development of preterm infants, including neurodevelopment of preterm infants in NICU, common behaviors and developmental characteristics of preterm infants, factors affecting neurobehavioral development of the preterm infant, 4) parental self-efficacy in preterm infant care in the NICU and its factors, 5) the Synactive theory of development, 7) the Neonatal Integrative Developmental Care Model, and 8) review of neurodevelopmental care interventions.

Preterm infants

A preterm infant or premature baby refers to an infant who was born alive less than 37 weeks or 259 days (WHO, 2018). Preterm birth is classified into different four types based on gestational age, including extremely preterm (< 28 weeks), very preterm (28 to < 32 weeks), moderate preterm (32 to 34 weeks), and late preterm (34 to < 37 weeks) (Glass et al., 2015). It can be divided into three sub-categories based on birth weight, consisting extremely low birth weight which includes infants' weight of fewer than 1,000 grams, very low birth weight which includes infants' weight of fewer than 1,500 grams, and low birth weight which includes infants weighing less than 2,500 grams respectively (Glass et al., 2015; Pilliteri, 2014). Furthermore, it can be divided into three groups based on gestational age and birth weight, such as small for gestational age (SGA) (weight less than the 10th percentile for gestational age), appropriate for gestational age (AGA) (weight between the 10^{th} and 90^{th} percentile), and large for gestational age (LGA) (weight greater than the 90^{th} percentile) (Glass et al., 2015; Hockenberry & Wilson, 2018). Those infants are classified into different types because they have

different risks for health problems and require specific care.

Characteristics of the preterm infant

The characteristics of a preterm infant are determined by the gestational age and the appearance is shown by various types (Chapman & Dorham, 2010; Hockenberry & Wilson, 2018; Ricci, 2007):

1. Physical characteristics

1.1 Low birth weight and length is less than 47 centimeters.

1.2 Preterm infants' eyes are closed all the time; their eyelids are convex and swell out. Eyelids open between 26 and 30 weeks of gestation.

1.3 The vernix caseosa is rare, especially in preterm infants. When infants who have age less than 25 weeks, vernix caseosa cannot see because of underdevelopment

1.4 The head is significantly related to the body which reflects the cephalocaudal direction of growth.

1.5 Lanugo hair is found on the face, back, and arms, while the hair is sparse, fine, and fuzzy on the head.

1.6 The skin is either quite red or bright pink, translucent, smooth, and shiny, with small blood vessels visible.

1.7 The infant's nails begin to germinate at the gestation period of about 20 weeks gestation and reach the end of the finger at the full term of gestational age.

1.8 The soles and palms have minimal creases, giving them a smooth appearance. Wrinkles appear from the tips of the toes first, and then it slowly increases towards the ankle. Which is visible and abundant at the gestational age of approximately 36 weeks.

1.9 When infants were born at less than 32 weeks, the ears are soft and easy to fold. When released, the infant's ears are still folded because there is no cartilage. At 36 weeks of gestation, ears are rebounded to their original shape.

1.10 Genitalia, the male infant has few scrotal rugae, and the testes are undescended. Descended testes will be present at 37 weeks of gestation. The female has a prominent clitoris as well as a minor labia.

1.11 Flat nipple: At about 34 weeks of gestation, a preterm infant could see the nipples.

2. Movement: The preterm infants have less mobility and fewer reactions. When they move, they also twitch, cry softly, and do not cry. Most of them fall asleep. They have difficulty opening their eyes but have a good reaction to light.

3. Temperature control: These premature babies have a large body surface area relative to their body weight and less subcutaneous fat or brown fat. Therefore, they poorly control temperature.

4. Preterm infants have slight gagging and coughing. Therefore, it is causing problems when they get food. Moreover, they have easily choked after eating food as well.

5. Respiratory system, as the respiration of preterm infants continues to grow and develop, the risk of complications affects the baby's ability to breathe and adapt to the external environment.

6. Urinary system: the ability to sweat solution in urine, sodium, and chloride is reduced, so the swelling of the baby is easy to find.

7. Perivascular blood circulation system: Vascular walls are fragile and easily broken, and multiple blood clotting factors are insufficient, resulting in rapid brain bleeding. Short-lived red blood cells, combined with inadequate liver function, also easily become hyperbilirubinemia as well.

8. Digestive ability: at birth, the surface area of the stomach and intestinal mucosa is small, less jagged, digested, and absorbed more carbohydrates and proteins than lipids. Preterm infants often have frequent regurgitation due to low pressure inside the Guardia sphincter combined with the closure of the muscular pyloric sphincter. The muscle is not growing properly, so they also have constipation easily.

9. They are easily getting sick because of the immune system dysfunction to produce white blood cells. There are few immune proteins from the mother, including incomplete IgM formation, and the neonate's skin is thin and scratches easily, causing infection. The characteristics of preterm infants indicate their age at immaturity, which is different from those of full-term infants. As a result, these infants are at risk for both short-term and long-term health problems.

10. Neurobehavioral development: when the preterm infants are given as quickly as possible, the brain is easily getting fragile (Altimier et al., 2015).

Infants who are born preterm have unique characteristics that reveal their immaturities, which are distinct from those of term infants. As a result, they are vulnerable to health problems that affect both short-term and long-term health outcomes.

Health problems of preterm infants

Preterm infants with major health problems require specific care in the newborn intensive care unit after getting birth and typically stay in this unit for an extended period. Major health problems reported in preterm infants (Behrman et al., 2007; Ward et al., 2015; Chapman & Dorham, 2010; Gouyon et al., 2012; Pilliteri, 2014) are as follows:

1. Respiratory distress syndrome (RDS) is a developmental respiratory disorder that affects preterm infants because of a lack of lung surfactant. The most important intervention for newborns with RDS is oxygenation. Mechanical ventilation with endotracheal intubation is used to provide oxygen. To avoid oxygen toxicity complications such as bronchopulmonary dysplasia (BPD) and retinopathy of prematurity (ROP), these infants are typically weaned from mechanical ventilation as soon as possible (ROP). Nursing care for an infant with RDS necessitates meticulous nursing assessment and vital sign monitoring. Significant changes in vital signs must be accurately recorded and reported to the physician by the nurses.

2. Apnea of prematurity is commonly found in preterm infants. Consequently, the majority of preterm infants require cardiorespiratory (C-R) monitoring. The electrodes of the C-R monitor are frequently changed based on the NICU protocol, and new skin sites of the preterm infants are chosen each time to prevent its breakdown from the electrode adhesive. The C-R monitor is set to sound an alarm that responds when symptoms of an infant fail to breathe spontaneously for 20 seconds, the respiratory rate falls below 20 breaths per minute, or the heart rate drops below 100 beats per minute. The monitor’s alarm alerts nurses to an apnea or bradycardia spell in progress in the infant, which requires immediate attention to resolve.

3. Hyperbilirubinemia is commonly found in preterm infants because of their immature liver. The treatment of jaundice is determined by the underlying

causes. Phototherapy must be used to treat infants who are in the high-risk zone on the bilirubin risk chart. Hydration with an electrolyte solution is used to treat hyperbilirubinemia when the infant exhibits signs of dehydration, for example, dry skin and mucous membranes, poor fluid intake, concentrated urine, limited urine output, and irritability. Nurses must have special potential to look after them properly by observing signs and symptoms of jaundice, providing proper care when they get phototherapy, and detecting all severe complications after receiving this treatment as well.

4. Retinopathy of prematurity (ROP) is a common complication in preterm infants, leading to a high risk of visual impairment or blindness. Infants born extremely preterm are especially vulnerable. It is caused by immature retinal vasculature followed by hypoxia. During oxygen administration, the goal of treatment is to keep PaO_2 at no greater than 80 mmHg. To protect a preterm infants from developing ROP, they should be weaned off oxygen as soon as possible. Furthermore, they require being in an appropriate environment with the least amount of stimulation. As a result, nurses should reduce the intensity of the continuous bright lights in the infant's environment. During the day, a blanket is placed over the incubator. Naptime can be designated by dimming the lights and reducing other sounds.

5. Anemia of prematurity is exaggerated of the physiological anemia of infancy caused by suppressed hematopoiesis for 6 to 12 weeks after birth and is earlier in onset and symptomatic. Its causes are multifactorial, including blood loss from frequent blood sampling, the shorter red blood cell survival in preterm infants, suboptimal response to anemia, and an increased need for red blood cells with infant growth. Preterm infants frequently require red blood cell transfusions. Many of the most sickly and immature infants require multiple transfusions. Nursing care consists of blood transfusions, monitoring the side effects of the procedure, and obtaining and monitoring hemoglobin and hematocrit levels as directed by the physician.

6. Patent ductus arteriosus (PDA) is the most common cardiovascular abnormality in preterm infants, which is inversely proportional to gestational age (GA) and birth weight (Prescott & Keim-Malpass, 2017). The ductus arteriosus remains patent in approximately 50–70% of extremely low birth weight infants

(Benitz, 2016). Only 13% of infants born at 24 weeks of gestation have their ductus closed by the end of the first week in the extreme preterm population (Clyman et al., 2012). The PDA causes a left-to-right shunt of blood flow, leading to increased pulmonary blood flow and decreased systemic circulation. Significant shunting can cause a variety of symptoms, including apnea, respiratory distress, and heart failure.

7. Intraventricular hemorrhage (IVH). The most common and serious neurologic injury in preterm infants is intraventricular hemorrhage (IVH). Approximately half of all cases of IVH occur within the first 24 hours of birth, and up to 90% occur within the first 72 hours. Gestational age, very low birth weight, male sex, and low Apgar scores are all risk factors for IVH (Islam & Leung 2020). Extremely preterm infants are especially vulnerable to brain injury, whereas these complications are uncommon in infants born after 28 weeks of gestation. IVH is classified into four severity grades: Grade I (subependymal region and/or germinal matrix), Grade II (lateral ventricle extension without ventricular enlargement), Grade III (lateral ventricle extension with ventricular enlargement), and Grade IV (intraparenchymal hemorrhage), with grades 3–4 being classified as severe IVH (Annibale & Hill, 2018). The IVH grade 3 is IVH with ventricular dilatation; infants with IVH grade 3 may develop progressive hydrocephalus. In addition to intraventricular bleeding, IVH grade 4 indicates that there is an infarction in the brain parenchyma. An IVH is a subgroup of intracerebral hemorrhage (ICH) that can be minimal or extensive, with symptoms ranging from asymptomatic to seizure activity. The priority of nursing care centers is the recognition of infant seizures so that treatment can begin immediately.

8. Feeding intolerance. The immature gastrointestinal tract makes it difficult to digest food that is required for continued growth and development. Based on clinical and biological data (Montjaux-Regis et al., 2011), feeding intolerance is defined as the presence of digestive events such as abdominal distension, pregavage residuals, and necrotizing enterocolitis (NEC), and cholestasis. The treatment for feeding intolerance in preterm infants is to provide them with adequate nutritional requirements for growth. Nursing care monitors weight daily and assesses for signs of NEC such as abnormal vital signs, abdominal distention, abdominal discoloration, bowel loops, feeding intolerance, emesis, residuals, bloody stools, and behavioral

changes.

9. Infection and an immature immune system. Preterm infants have immature immune systems that are inefficient at fighting off the bacteria, viruses, and other organisms that can cause diseases. Intravenous antibiotics are used to support other organ systems in septic infants. Hand hygiene is critical in nursing care to prevent infection. In addition, nurses play an important role in the early detection of signs and symptoms of infection in preterm infants.

Preterm infants must be admitted to the NICU due to these health problems and complications, which are completely different from those in the mother's womb. They are exposed to inappropriate environmental stimulation, such as light and sound environments, medical touch, and pain-inducing nursing activities (Blackburn, 1998; Hunt, 2011). As a result, special attention in the NICU is required to have both short-term and long-term health outcome effects on preterm infants, particularly those related to their growth and development.

Preterm infant growth

Growth is expressed through changes in anthropometric measurements, including weight, length, and head circumference. Growth is dynamic during the neonatal period. It is characterized by initial weight loss followed by a recovery of the birth weight. The severity and duration of both phases were related to preterm gestational age. Therefore, preterm infants weighing less than 1000 grams will have their birth weight regained in the first week of life and thereafter progress at the same growth velocity as in the womb (Rugolo, 2005; LaHood & Bryant, 2007).

Growth of preterm infants in the NICU

Growth in preterm infants is gaining attention because it is associated with long-term neurodevelopment and overall health outcomes but promoting preterm infant growth in the NICU is extremely difficult. Stunted growth starts in the first few weeks of life. Although growth is an important aspect of preterm infant care in the NICU, it is unfortunate that growth is frequently a secondary concern when compared to stabilization and management of acute illness. As a result, promoting preterm infant growth, particularly in extremely preterm infants, is a difficult challenge in the NICU. Growth during the NICU, on the other hand, is associated

with long-term health outcomes. Slow growth velocity is associated with poor neurodevelopment outcomes (Steward, 2012).

Growth characteristics of preterm infants

Various factors influence prenatal and postnatal growth. The fetus's intrauterine growth is dependent on the nutrients supplied by the placenta, which can be affected by the maternal disease (Riddle et al., 2006). Infant postnatal growth differs from in utero growth for several reasons, including the extrauterine environment, different nutritional requirements, and morbidity associated with both prematurity and low birth weight (Mathew et al., 2017). Preterm infant growth patterns differ depending on gestational age, gender, weight, genetics, and coexisting morbidities (Bertino et al., 2011; LaHood & Bryant, 2007). Preterm infants with a history of intrauterine growth restriction, as well as those who are small for gestational age, have lower rates of catch-up growth and higher rates of weak growth than infants born at an appropriate weight for gestational age (Carlson, 2005). Many factors influence the quantity and quality of growth, particularly catch-up growth and body composition (Steward, 2012).

Growth assessment

The growth rate of preterm infants is different from that of full-term infants. The measurements or evaluations of the infant's head circumference, body weight, and body length are critical in determining the infant's growth (LaHood & Bryant, 2007).

1. **Head circumference (HC)** is the first parameter. It is the best predictor of catch-up growth and neurodevelopment, especially during the first 38 months of life, because it is a direct measurement of skull growth and an implied measurement of brain growth. Head growth in preterm and low birth weight infants is approximately 0.5 centimeters per week until three months of age, then slows to 0.25 centimeters per week from three to six months. Microcephaly can occur during the first few months of life if preterm infants have a head circumference growth rate of fewer than 0.5 centimeters per week. If preterm infants grow more than 1.25 centimeters in head circumference per week, they should be evaluated for hydrocephalus (Bernbaum et al., 2002). A standard tape is used to measure the head circumference. The circumference of the head is measured in centimeters and to the

nearest millimeter.

2. **Body length** is used as one indicator of growth. Body length, if accurately measured, reflects skeletal growth and fat-free mass (Pereira-da-Silva et al., 2019). It is the only measurement of bone growth, and there are fewer relevant factors that influence body length. Normally, body length increases by approximately 1.1 centimeters per week until term (Swanson & Berseth, 1987). Because of the infant's health status, measuring the length of extremely preterm infants can be quite problematic, and measuring length is more invasive than measuring weight and head circumference. An accurate measurement technique is essential for evaluating longitudinal growth, and it is preferable if the infant is measured by the same person.

3. **Bodyweight** is an important growth indicator that shows whether an infant is malnourished or overfed. The most commonly used anthropometric measurement in NICUs is weight. While the infant is unclothed and quiet, it should be weighed. A significant amount of infant motion can cause weight to be falsely increased (Kenner & Lott, 2014). Weight loss after birth is caused by changes in cellular fluid compartments. The expected postnatal weight loss is determined by the hydration status at birth; for example, intrauterine growth-restricted neonates typically lose less weight than eutrophic neonates. Environmental and nutritional factors both have a significant impact on postnatal weight loss (Jochum et al., 2018). The extremely preterm infant may lose more than 10 percent of his or her birth weight; this excessive weight loss can be caused by dehydration but can also be influenced by nutrition. It has been observed that extremely preterm infants with a gestational age of fewer than 26 weeks lost 16 percent of their birth weight, with a nadir on the sixth day of life, and regained birth weight at 18 days of life (Horemuzova et al., 2012). The desired weight gain is determined by the size of the infant, gestational age, and health conditions. For a giant baby in 33 weeks, it could be 20 grams per day. The current weight-gain recommendation is 15 grams per kilogram per day. This is the rate at which preterm infants gain back their birth weight (Ehrenkranz et al., 2011). Preterm birth has a growth rate of about 14 grams per kilogram per day. These initial growth patterns usually persist and are reflected in the attained weight of preterm infants (Steward, 2012).

However, to promote preterm infant growth, it is necessary to consider the factors affecting the growth of preterm infants. As a result, the new intervention should be developed based on the factors that influence preterm infant growth.

Factors affecting the growth of preterm infants

Many factors influence the growth of a preterm infant, including the following:

1. **Physiological weight loss.** In preterm and low birth weight neonates, initial physiological weight loss of roughly 7–15% of birth weight is common in the first seven days of life (Ndembo et al., 2021). Recovery occurs with an increase in body weight from roughly the tenth to the twenty-first day of life (Namiiro et al., 2012). Preterm infants lost more weight than term infants in the first week. Most infants lose some weight after birth, and this weight loss is considered physiological due to the loss of extracellular water upon leaving the water-based intrauterine environment (Fenton et al., 2013). In the first week of life, preterm infants lost an average of 90 grams at a negative growth rate of 12.80 grams per day (Singh et al., 2009). Preterm infants start to gain weight again after two weeks, and preterm infants with very low birth weight will require a more extended period, such as 3–8 weeks (Bernbaum et al., 2002). Preterm infants had a catch-up period with a growth rate range of 20 gm/day in the second week and 28-32 gm/day thereafter (Singh et al., 2009).

2. **Nutrition intake.** During NICU hospitalization, the growth velocity of extremely low birth weight infants has a significant and possibly independent effect on neurodevelopment and growth at the age of 18 to 22 months (Ehrenkranz et al., 2006). Evaluating growth in the NICU should take into consideration growth within the context of nutritional practices in the NICU (Ehrenkranz et al., 2011; Sakurai et al., 2008; Yoshida et al., 2011). Among other factors associated with the growth of preterm infants during initial hospitalization, Berry et al. (1997) included energy intake and protein intake.

When infants are exposed to sensory overload in their environment, their energy expenditure and nutritional requirements increase. Preterm infants, in general, have severely limited nutrient supplies and are less able to benefit from them. Therefore, preterm infants in the NICU exhibit cumulative protein and energy

deficiency throughout their hospitalization (Rugolo, 2005). Furthermore, enteral nutrition tolerance and nutritional intake are linked to preterm infant weight gain (Steward, 2012). For the first six weeks of life, the cumulative protein deficit was the primary determinant of postnatal growth. Cumulative nutritional deficiency in very preterm infants may be reduced after optimizing nutrition during the first weeks of life. Parenteral nutrition improved early dietary supply and initial weight loss significantly (Senterre & Rigo, 2012).

3. **Infant's health condition.** An infant's illness, in combination with other factors, affects the potential to establish an anabolic metabolism, which is essential for optimal growth and otherwise would lead to postnatal growth restriction (Fusch & Samiee-Zafarghandy, 2014).

As a result, promoting the infant's growth during the NICU stay in the first month of life is very important because it is associated with better neurodevelopmental outcomes in the later stages of the infant's growth (Belfort et al., 2011). Furthermore, preterm infants who catch up on growth would reduce the length of their NICU stay as well as reduce the cost of care (O'Brien et al., 2013). However, preterm birth has an impact not only on the infant's growth but also on the infant's neurobehavioral development.

Neurobehavioral development of preterm infants

An inconstancy in the development of preterm infants can lead to later difficulties that differ from those of healthy full-term infants in two important ways. First, preterm infants' bodily systems, including their immature central nervous system, must adapt to the extrauterine environment (CNS). Second, the interruption of intrauterine life has a significant impact on the infant's context. As a result, the preterm infant spends the last weeks or months of gestation in a NICU that is very different from the intrauterine or home environment of a healthy full-term infant (Leppert & Allen, 2012).

Consequently, the neurologic, neurobehavioral, and neurosensory development of preterm infants was affected. Therefore, preterm infants face greater challenges than term infants in demonstrating neurobehavioral development. Volpe et al. (2017) identifies six stages of human brain development and the times at

which they occur. It consists of the following stages: 1) primary neurulation (3-4 weeks of gestation), 2) pros encephalic development (2-3 months of gestation), 3) neuronal proliferation (3-4 months of gestation), 4) neuronal migration (3-5 months of gestation), 5) organization (5 months of gestation to years postnatal), and 6) myelination (birth to years postnatal). From 6 months of gestation to at least three years from the term, neurons continue to differentiate, and axons grow out and connect to dendrites to form synapses (Behrman et al., 2007). As a result, preterm infants are delivered while their CNS is not fully formed. The first three stages of CNS development were completed before the fourth month of gestation. The last three steps continue during the time many infants are in the NICU and have implications for the effects of the NICU environment and care (Blackburn, 2012; Volpe et al., 2017).

Neurodevelopment of preterm infants in NICU

Before the fourth month of gestation, the first three stages of CNS development (dorsal induction, ventral induction, and neurogenesis) were completed. The final three steps (neuron migration, organization, including synaptogenesis and arborization, and myelination) continue during many infants' duration of stay in the NICU and have implications for the effects of the NICU environment and care. In particular, areas of development during the last part of gestation that are especially important in considering the neurobehavioral vulnerabilities of ill or immature infants include (1) autonomic homeostatic control, (2) alterations in the germinal matrix and migration of neurons and glial cells, (3) CNS organizational processes, (4) development of the neocortex, and (5) growth of the cortex and cerebellum (Blackburn, 2018; du Plessis & Volpe, 2018).

The behavioral characteristics of immature infants, such as altered state regulation and increased and decreased tone, also reflect the developmental stage. Furthermore, alterations in primitive reflexes, increased irritability, immature inhibition, jerky movements, lower arousal, less ability to sustain alert states, more deficient coordination, altered autonomic regulation, and asymmetrical and uncoordinated posture, and movement are also observed (Blackburn, 2012).

Neurobehavioral development

The infant's neurobehavioral and neurosensory development is comprised of the neurologic and sensory systems, which are not separate entities but are interdependent. The central nervous system receives messages and interprets, integrates, and organizes them before sending them out to produce motor, language, or emotional responses. Every sensory experience is recorded in the brain, which results in a behavioral response, which leads to yet another sensory experience. The foundation for neurobehavioral and neurosensory development is this cyclic, interdependent action and reaction (Altimier & Phillips, 2013).

Preterm infants begin to achieve some degree of physiologic homeostasis at approximately 28 to 32 weeks of gestational age, with increasing control of the sympathetic system over their autonomic functioning. The infant develops more automatic stability with the addition of automatic controls. This autonomic stability is exemplified by reduced apnea and bradycardia. Over the next few months, as these infants progress toward more cortical control, their development is characterized by periods of temporary organization followed by periods of disorganization as new levels of maturation and control are acquired. Sleep-wake patterns, the proportion of transitional or unstable sleep, fragmented behavioral responses, and reflexes all reflect these periods of disruption in the infant (Spittle et al., 2014).

According to a review of the literature, there is a problem with neurobehavioral development, which indicates a neurological status (Schlappbach et al., 2012; Sullivan et al., 2012). The neurobehavioral scores of preterm infants were lower at term than those of healthy term infants (Jeng et al., 1998). This finding was consistent with the findings of Spittle (2016), who discovered that full-term infants performed better in terms of neurobehavioral and neurological development than moderate and late preterm infants. Furthermore, Gorzilio et al. (2015) discovered that preterm infants' neurobehavioral development was affected before term age due to acute stressful events during neonatal hospitalization. The findings of this study revealed that prematurity level and acute stressful events predicted motor development, vigor, alertness, and orientation in preterm infants. The motor development and vigor scores of moderately preterm infants were lower. They cried

with lower quality than late preterm infants.

Common behaviors and developmental characteristics of preterm infants

Preterm infants' developmental and behavioral characteristics must be considered according to four underlying principles (Hadley & West, 1999). To start with, each infant's responses, preferences, and tolerances are all different. Second, an infant's responses, choices, and endurance may alter throughout time, even from one moment to the next. Furthermore, preterm infants' behaviors can be used to communicate their needs and level of comfort. These behaviors can be found in one or more developmental subsystems, such as motor, autonomic, and arousal state levels. Finally, an infant's responses are influenced by the quality and techniques of caregiving. Movement, sleep-wake cycles/behavioral states, vision, hearing, touch, feeding, and social/emotional characteristics are common behaviors and developmental characteristics in preterm infant subsystems at particular postconceptional ages.

The following are the common behaviors and developmental characteristics of each preterm age (Hadley & West, 1999):

1. The infants with poor muscular tone are preterm infants aged 26–28 weeks postconception. Their sleep-wake cycles aren't clearly defined, and their behavioral states aren't well characterized either. Their taste and smell receptors may be functioning. The infant's eyes may open occasionally at 26–28 weeks after conception, although they usually do not focus. Around 28 weeks postconceptional age, the infants may begin to orient to soft sound sources and respond to and prefer the voice of their parents. They can't nipple feed and must start nonnutritive sucking at 28 weeks. The infant, on the other hand, is unable to engage in reciprocal social interaction and has a low tolerance for social stimuli. Furthermore, the behavioral organization for self-regulation efforts is restricted.

2. Preterm infants' quiet/deep sleep increases approximately 30 weeks postconceptional age in preterm infants aged 28–30 weeks postconception. Their eye-opening increases at approximately 30 weeks postconceptional age. Between 28 and 34 weeks postconceptional, their orienting behavior to soft sounds may increase. Their behavior in response to noise may be inconsistent. In general, infants

are incapable of reciprocal social interaction. They may become quiet and alert to their parents' voices.

3. The infant's movements are more controlled in preterm infants aged 30–32 weeks postconception. Around 32 weeks, infants exhibit the "silent alertness" stage. They may also focus on visual stimuli such as human faces for a brief period. Their behavior reflects a preference for human voices, and their responses to sound may become more consistent and organized. Their suck-swallow reflexes are maturing, but nipple feeding does not succeed for them. Hand-to-mouth activity and other coping behaviors in infants may increase to regulate themselves. At 32 weeks postconceptional, they become more awake and make occasional eye contact, which can enhance the parent-infant relationship and attachment processes.

4. Preterm infants aged 33–36 weeks postconceptional can self-regulate through posture and movement. Their behavioral states are more distinct. The rules governing their sleep and wake transitions become smoother. They may begin to awaken spontaneously before feeding. They improve the ability to maintain lid tightening in response to bright light. Their behavioral responses to the auditory environment are generally more consistent and organized. Infants are usually able to begin nipple feeding.

In conclusion, the functioning behaviors of infants can be used to estimate their current development at a given age (Als & Butler, 2011). In order to promote the neurodevelopment of preterm infants, it is necessary to study the factors affecting the neurodevelopment of preterm infants. The new intervention should be also developed based on the factors that influence preterm infant neurodevelopment.

Factors affecting neurodevelopment of preterm infants

Preterm infants' neurodevelopment is influenced by a variety of factors. The following are the most important factors:

1. Health problems. Physical illnesses such as preterm birth, birth asphyxia, infection, bronchopulmonary dysplasia, renal disease, subglottic stenosis, intraventricular hemorrhage, intracranial infection, and hypoglycemia harm the infant neurodevelopment (Rugolo, 2005). The preterm infant's organs are immature, and he or she is at risk of developmental delays (Brandt et al., 2003). The motor development, vigor, alertness, and orientation of preterm infants were predicted by

prematurity level and acute stressful events (Gorzilio et al., 2015). Illnesses in infants, such as pulmonary problems, cardiovascular problems, neurological problems, gastrointestinal problems, and so on, can affect the integrity and potential of the preterm infant's body in various aspects of development and intact organ function (Fusch & Samiee-Zafarghandy, 2014). Furthermore, respiratory illness had a marginal effect on the rate of low neurobehavioral development scores (Jeng et al., 1998).

2. **Nutrition.** Receiving parenteral nutrition for six weeks, whether full or partial, is a significant risk factor (OR=2.5) for developmental impairment in school-age children (Vohr et al., 2005). Organizational events for brain development can be influenced by nutritional factors. Longer-chain polyunsaturated fatty acids are essential for neurological and retinal development and can improve neurological and visual function in infants. As a result, the level of such fatty acids in the infant's diet may be a key determinant of the effects of breastfeeding on neuronal development (Volpe et al., 2017). Mother's milk is the best nutrition for preterm infants because it contains nutrients that promote rapid growth and development. It also provides nutrients that are beneficial to neuron development (Belfort, 2018; Moro & Arslanoglu, 2020; Volpe et al., 2017). Breast milk has a distinct lipid profile and protein fraction that has an impact on infants' neurological development (Chiurazzi et al., 2021; Volpe et al., 2017,). According to the meta-analysis, breastfeeding is associated with improved cognitive development in children (Horta et al., 2015). Furthermore, breastfeeding has been linked to improved performance on intelligence tests (Horta et al., 2015).

3. **NICU environment.** Preterm infants' neurodevelopment is influenced during NICU hospitalization, and their experience may have a significant impact on their brain's development and functioning (Altimier et al., 2015; Head, 2014; Volpe, 2009). Between 24 and 40 weeks of gestation, the infant's brain grows significantly while in the NICU (Pickler et al., 2010; Volpe, 2009). Multiple neurological events occur, such as the creation of synaptic and neuron connections, as well as the proliferation of essential structures such as the thalamus, cortex, and cerebellum, all of which are vulnerable to external and internal experiences (Volpe, 2009).

Environmental stimuli from the NICU environment, such as bright lights, loud noises, frequent disturbances, and specific painful medical procedures, are potentially dangerous stimuli affecting premature infants. The reactions of preterm infants to harmful stimuli affect both short-term and long-term outcomes, including growth and development (Sullivan et al., 2012), particularly for neurobehavioral developmental problems (Braga & Sena, 2012; Schlapbach et al., 2012). Acute traumatic events and prolonged stress can lead to early neurological injuries and changes in psychokinetic development, as well as long-term neurological development (Bouza, 2009). The continuous interplay of stimuli in the NICU affects an infant's still-developing brain and sensory systems when he or she is born prematurely. Events, incentives, and environmental factors can either support or interfere with neural development processes. When immature neural systems are stimulated out of turn or with inappropriate stimuli, neural interference can occur. Neurosensory background stimulation must be at a level that allows sensory systems to discriminate and accommodate meaningful signals or stimulation. This observation is extremely accurate for sound, touch, smell, position, and comfort, all of which are part of early neurosensory development and in utero learning, also known as NICU learning (Graven, 2006).

Infants, as well as staff and families, are affected by high noise levels in NICUs. Physiologic effects of loud transient noise include increased heart rate, blood pressure, and respiratory rate (RR), apnea and bradycardia, increased oxygen, and increased intracranial pressure (Wachman & Lahav, 2011). Noise also disrupts sleep, impairs hearing, and decreases oxygen saturation, all of which are detrimental to neurological development (Chen et al., 2009; Domanico et al., 2010; Graven, 2006; Krueger et al., 2007).

Preterm infants' visual development and sleep disturbances are affected by intense light exposure (Altimier & Phillips, 2013). The amount of light that enters the eye is controlled by the eyelids and the iris. Infants born before 32 weeks of gestation or less have thin eyelids and little or no pupillary constriction, allowing light to reach the retina faster than more mature infants, children, and adults (Graven, 2011; LeVay et al., 1980). As a result, the light and sound levels in the ward should be controlled to meet the standards established by the department's

sound level control, should not exceed 45 decibels, and the light level should be controlled within a range of 1-60 feet (White et al., 2013). Taking care of a preterm infant for 28 to 36 weeks should pay off. Protecting the sleep cycle, especially REM sleep, should be a priority when caring for a preterm infant for 28 to 36 weeks. During this period, the system is disrupted by intense stimulation from the NICU's sound, vibration, and other stimuli. Other senses have the potential to significantly inhibit the development of the visual system (Lickliter, 2011).

Changes in these environments should reduce their negative effects. It is essential to provide developmental care, such as interventions to reduce NICU stress. Controlling external stimuli (vestibular, auditory, visual, and tactile), groups of nursing care activities in the NICU, and positioning of the preterm infant are all possible components of these interventions. Developmental care can help to improve head circumference measurements, reduce the incidence of IVH and ventricular enlargement, and improve neurobehavioral and neurophysiological function (Als et al., 2003; McAnulty et al., 2009).

4. **Interactions between parents and infants.** When preterm infants are admitted to the NICU, they will be separated from their parents, which affects the interactions between parents and infants factor. As a result, it was limited to communication with their parent. The ultimate goal of ensuring neurodevelopment is supported by standard standards should be zero separation from parents, rather than simply preventing the effects of toxic stress (Boykova & Kenner, 2010). Mother-infant interaction has a significant impact on brain development, including brain structure and function (Altimier & Phillips, 2016). Tactile stimulation between mother and infant promotes maternal response and infant attachment (Hofer, 2006). Lower maternal sensitivity is associated with a small subcortical gray matter volume, which is similar in both sexes. Male infants who demonstrated higher levels of positive communication and engagement during early interactions, on the other hand, had smaller cerebellar volumes. These preliminary findings suggest that the variability in the interaction between mother and infant is related to differences in the infant's brain development (Sethna et al., 2017). When the quality and/or quantity of parental care for infants is limited, such as preterm infants in the NICU,

these unwanted experiences can lead to adverse changes in brain structure and function (Bystrova et al., 2009).

5. Caregiving experience. Experience during the critical periods of early childhood organizes connectivity within the developing brain and encourages neurologic maturation for the caregiving experience (Baroncelli et al., 2010). When a preterm infant is cared for in the NICU, his or her neurosensory development is overstimulated. Preterm infants' environments in the NICU are less predictable in terms of providing appropriate stimulation to support and enhance neuronal development: caregivers change frequently; medical procedures dictate touch and handling; and little care is provided based on infant cues (Pickler et al., 2010). Preterm infants in the NICU have potential maladaptive development (Als & Butler, 2011). They are unable to tolerate sensory overstimulation due to their immature central nervous system (Altimier & Phillips, 2013), resulting in their development permanently deviating from the normal process of neurobehavioral development (Rees et al., 2011). According to a study conducted by Buehler et al. (1995), preterm infants who received care based on their neurobehavioral capabilities were more organized in both motor and autonomic regulation, had better self-regulation, and were more able to calm themselves. Therefore, providing interventions that reduce inappropriate stimulation has the potential to promote more normal development.

As difficulties in mother-infant relationships and synchronization demonstrate, early social interactions constitute a risk situation for the development of preterm infants. Reproducing some of the uterine experiences through increased contact with the caretaker, such as through kangaroo therapy, is important for reducing mother-infant separation. Furthermore, preterm infants' motor patterns are influenced by biological factors such as interruption of normal brain maturation and focal brain injuries, as well as environmental factors such as postural constraints in the NICU (Sansavini et al., 2011). NICU nurses should seek to implement strategies that mimic the intrauterine environment and provide more appropriate incentives that promote the infant's state of alertness and responses to minimize adverse stimuli and support neuron maturation (Behrman et al., 2007). Preterm infants will be given equal opportunities in all aspects of development as their counterparts in

utero until they reach term age, according to NICU nurses (Fusch & Samiee-Zafarghandy, 2014).

In summary, factors influencing preterm infant growth and neurodevelopment, such as health problems, nutrition, the NICU environment, parent-infant interactions, and care experiences, must be considered for the development of preterm infant developmental care programs. In addition, nurses should encourage parents to have self-efficacy in caring for the infant.

Parental self-efficacy

The term “self-efficacy” refers to an individual’s belief in their ability to complete a given task successfully. Self-efficacy can influence how a person behaves by indicating whether they attempt a task, how much effort they put into the task, and how long they persevere in the face of obstacles and aversive experiences (Bandura, 1997). There are four principal sources that can influence self-efficacy attainment (Bandura, 1997) including 1) Performance Accomplishments: Because it is based on personal mastery experiences, this source of efficacy information is especially powerful. Personal evaluation data based on an individual’s accomplishments. Previous successes raise expectations of mastery, while repeated failures lower them. 2) Vicarious Experience: Acquired by observing others successfully perform activities. This is known as modeling, and it can instill in observers the expectation that they can improve their performance by learning from what they have observed. 3) Verbal Persuasion: Activities in which people are led to believe, through suggestion, that they can successfully complete specific tasks. Verbal persuasion techniques like coaching and giving evaluative feedback on performance are frequently used. 4) Physiological States: A person’s emotional or physiological states affect how they feel about their ability to perform particular tasks. A person’s ability to complete the tasks may be negatively judged as a result of emotional responses to such tasks (such as anxiety). Parental self-efficacy has received clinical and research attention (Jones & Prinz, 2005). Parental self-efficacy (PSE) is a multidimensional concept that is defined as parental beliefs or confidence in their ability to successfully carry out parenting tasks. It is a distinct, domain-specific concept captured by self-efficacy theory (Bandura, 1997; Jones & Prinz,

2005). As a result, parental self-efficacy is critical for parents to succeed in their roles (Vance & Brandon, 2017).

Mother's self-efficacy is an important concept for directing possible instruments related to the difficulties of the early mother-infant relationship and infant development (Teti & Gelfand, 1991). The mother's self-efficacy refers to her beliefs and expectations about her ability as a successful parent, as well as her ability to positively influence the infant's development and behavior (Coleman & Karraker, 2003). The long-term result of the mother-infant relationship, as well as the neurodevelopment and behavioral development of at-risk newborns, can be predicted by maternal self-efficacy in her parenting abilities (Aarnoudse-Moens et al., 2009; Jones & Prinz, 2005; Melnyk et al., 2001). The higher the parental self-efficacy (PSE), the more positive the parent's behaviors are. Inductive and non-harsh punitive discipline practices, parental involvement and monitoring, and responsiveness and warmth toward infants, children, and adolescents have all been demonstrated to have this relationship (Jones & Prinz, 2005). Parents who lack self-efficacy, on the other hand, are vulnerable to frustration, stress, and depression (Sanders & Woolley, 2005). PSE levels are also strong predictors of a child's social adjustment and academic achievement (Ardelt & Eccles, 2001). According to a study of preterm infant behavior, preterm infants are less likely to initiate interaction, less likely to pay attention and exhibit fewer positive emotions and more negative emotions than term-born infants. Furthermore, when compared to term infants, preterm infants exhibit less responsive behavior in parent-infant interactions and are viewed as less rewarding social partners. As a result, parents of preterm infants may have more difficulty developing a sense of mastery and self-efficacy in parenting tasks (Pennell et al., 2012). Parents report a lack of knowledge and skills in observing and interpreting specific preterm infant behaviors, which may have an impact on parents' confidence (Kenner & Lott, 1990). Furthermore, a lack of knowledge about how to interact with their preterm infants (Pinelli, 2000), combined with an inability to fully utilize their parental role (Obeidat et al., 2009; Shaw et al., 2006), can cause high stress in such parents. The parents' confidence will be harmed as a result of their high level of stress (Baker et al., 2007; Zahr, 1991).

Therefore, the promotion of parental self-efficacy could improve the interaction between parents and preterm infants, reduce parents' stress levels and facilitate the establishment of parent-infant relationships (Loo et al., 2003; Raines & Brustad, 2012). Also, intervention studies have noted that confidence can improve with formal support or teaching (Jang & Ju, 2020; Rutledge & Pridham, 1987; Yang et al., 2004). In addition, supporting parents to understand the behavior of preterm infants can promote parental confidence (Larocque et al., 2015). Using a parent education program could help parents increase their knowledge of infant behavior and understand their infants better (Larocque et al., 2015, Phianching et al., 2020). Knowledge and experiences that fathers received could increase their self-efficacy to be confident in interactions with their infants (Phianching et al., 2020). Promoting parental self-efficacy in parents of preterm infants is very important because when a preterm infant has been discharged to home, these preterm infants need constant care to promote growth and neurodevelopment, in which the person responsible for the attention is the parent (Wangruangsatid et al., 2019). However, promoting parental self-efficacy in caring for preterm infants, factors affecting parental self-efficacy need to be studied. The new intervention should be developed in responding to the factors that influence parental self-efficacy in caring for the infant.

Factors related to parental self-efficacy in preterm infant care in the NICU

There are several factors associated with parental self-efficacy in preterm care in the NICU. The following details are provided for each factor:

1. Parent factor

Parents of preterm infants frequently lack understanding of how to parent their infants while in the NICU, resulting in frequent misperceptions of their infants (Melnyk et al., 2006). Lazarus's and Selye's definition of stress is the inability to cope with a perceived (real or imagined) threat to one's mental, physical, emotional, and spiritual well-being, which results in a series of physiological responses and adaptations (Seaward, 2019). Thus, maternal stress is defined as the mother's inability to cope with the perceived threat of preterm infant birth to her emotional and behavioral attachment. Maternal stress of preterm infant birth, as defined, includes

stress from sights and sounds in the NICU and nursery unit, the preterm infant's appearance, and the relationship with the preterm infant, as well as the maternal role (Miles et al., 1993).

2. Infant factor

According to a review of studies of preterm infants' behavior, preterm infants are less likely to initiate interaction, pay less attention, and display fewer positive and more negative emotions than term-born infants. Furthermore, when compared to term infants, preterm infants exhibit less responsive behavior in parent-infant interactions and are perceived as less rewarding social partners. Therefore, parents of preterm infants may have more difficulty developing a sense of mastery and self-efficacy concerning parenting tasks (Pennell et al., 2012).

The medical severity of preterm birth during the visits may facilitate or impede physical closeness between mothers. Coppola and Cassibbab (2010) discovered that NICU mothers spoke less with their infants who had severe medical conditions and that the more serious the medical condition was, the more focused the mothers were on the infant.

3. Policy and environment of the hospital

The hospital's policies and environment may make it difficult for parents to participate in preterm infant care. Preterm infants are separated from their parents from birth and have less parental touch and contact during postnatal care in the nursery or NICU (Orapiriyakul et al., 2007). The nursery or NICU environment contains more overstimulation, such as excessive light, noise, and pain, which causes preterm infants in the incubator or bassinette to become stressed and lonely (Shah, 2010).

4. Health care provider

The nurses' encouragement to stay with the infant and the mother's satisfaction with participating in infant care were both statistically significant. Mothers who were satisfied with their participation in infant care had a higher chance of receiving a participation score (Afroozi et al., 2017). Furthermore, a previous study discovered the significance of nurses' roles in assisting mothers in caring for their hospitalized infants. According to the findings, the only factor found to be associated with mothers' participation in care was nurse support (Pronlerttaveekun, 2013).

Resources, information, emotions, and assessment were among the types of support provided. According to a phenomenological study conducted by Gasquoine (2005), positive responses from nurses such as smiling, greeting, providing information, assisting with infant care, and providing the mothers with understanding and encouragement could help the mothers feel encouraged and part of a caregiving team, instilling bravery and confidence in providing care as well as having greater participation in caring for their infant.

As previously stated, many factors inhibited parental self-efficacy in preterm infant care in the NICU, including preterm infant factor, parent factor, hospital policy and environment, and healthcare provider. To enhance parental self-efficacy in preterm infant care, the parent factor, hospital policy and environment of the hospital, and healthcare provider must be concerned about factors for developing nursing support interventions because factors related to preterm infants are unmodifiable variables, except parent and environmental factors.

Synactive Theory

Als et al. (1982, 1986) established the synactive development (SDT) model to better understand how the fetus and newborn infant's neurobehavioral capacities are organized. This model describes the infant's emerging behavioral and organizational abilities. This model explains the infant's emerging behavioral and organizational abilities. This model assumes that infants actively communicate through their behavior, which becomes an important pathway for understanding stress or stability thresholds. The infant's behavior not only provides the main path of communication but also provides the foundation for the structure of developmental assessment and the provision of developmentally appropriate care (Als, 1986).

This synactive theory of development provides a model for identifying the degree of behavior differentiation as well as infants' ability to organize and control their behavior. Focusing is not about assessing skills; rather, it is a unique way for each infant to deal with the world around him or her. The synactive theory of development identifies both the range of neonatal behavior as the infant matures and the infant's ability to regulate behavior. This model is based on the assumption that

behavior is the primary means by which the infant communicates both functional stability and the limits of stress (Als, 1986; Lawhon & Als, 2010).

Synactive theory of development identifies development as an interactive and hierarchical process including five subsystems: 1) autonomic, 2) motor, 3) state organization, 4) attention and interaction, and 5) self-regulation. Infants saw to be continually interacting with the environment through five subsystems. These subsystems mature simultaneously, and within each subsystem, a developmental sequence can observe. Therefore, at each stage of development, new tasks and organizations are learned against the backdrop of previous development. The subsystems are interdependent and interrelated. For example, physiologic stability provides the foundation for motor and state control; the infant cannot respond socially to caregivers until motor and state control is achieved. The loss of integrity in one subsystem can influence the organization of other subsystems in response to environmental demands. In the preterm, less organized infant, the interplay of the system, continuously influences each other. In healthy full-term infants, these systems are synchronized and function smoothly. Thus, full-term infants can regulate their autonomic, motor, state, and attentional systems with ease and without apparent stress. However, less mature infants tend to be able to tolerate only one or minimal activity at a time and may quickly lose control if their thresholds are exceeded. Instability in the autonomic system can see in the pattern of respiration (pauses, tachypnea), color changes (red, pale, dusky, mottled), and various visceral signs (regurgitation, twitching, stooling).

Motor response development is closely related to state organization (Als et al., 1994), which is assessed by observing the infant's tone and posture (flexed, extended, hyper-flexed, and flaccid); specific movement patterns of the extremities, head, trunk, and face; and level of activity. Understanding the state system encompasses noting the available range of states of consciousness (sleep to arousal, awake to alert, crying), how well each state is defined (in terms of behavioral and physiologic parameters), transitions between states, and the quality of organization of these states. Initially, states may be poorly defined, particularly in the immature infant (Whitehead et al., 2018). Sleep and wake states, for example, maybe accompanied by jerky body twitches and fussing. Furthermore, the immature infant

may not be able to achieve clearly defined states as seen in the mature infant. Preterm infants are unstable and fragile at first, with abrupt changes in their autonomic, motor, and state systems. These infants often have a minimal response to handling or other sensory input until they reach a threshold, at which point they develop a cascade of responses that includes several color changes, flaccidity, bradycardia, and apnea. The infant's responses become more variable as he or she grows and matures, and the infant is less likely to decompensate (Als, 1986). The attentional/interactive system is responsible for the infant's ability to orient and focuses on sensory stimuli such as faces, sounds, or objects, i.e., the external environment. The system covers a wide range of abilities in states of consciousness, such as how well periods of alertness are defined and how transitions into and out of alertness are handled. At first, this alertness may be brief, with a dull expression or a glassy-eyed stare. As this system matures, the infant will be able to interact more easily and for longer periods. Social responsiveness necessitates that the infant maintains some awake and alertness level (Als, 1986). The self-regulatory system encompasses the behaviors that the infant employs to maintain the integrity and balance of the other subsystems, integrate the other systems, and move smoothly between states.

In conclusion, it appears that the development process is one of stabilization and integration of some subsystems, which allows differentiation and occurrence of others, which provides feedback to the integrated system. The entire system was reopened and transformed to a new degree of more differentiated integration as a result of this process, allowing the next newly emerging subsystem to differentiate and drive toward actualization and realization (Als, 1986). It is possible to establish and implement a plan of care to support the infant's emerging neurodevelopmental organization and reduce stress by observing and assessing the newborn infant's responses to the caregiver and other aspects of the environment across these five subsystems of behavioral functioning.

The Neonatal Integrative Developmental Care Model

The "Neonatal Integrative Developmental Care (NIDC) Model" is a new developmental care model that purposes to promote healthy development and prevent infant disabilities (Altimier & Phillips, 2013). This model was developed to simplify aspects of the world of developmental care (Gibbins et al., 2008), and it incorporates important concepts from the core measures of neonatal developmental care. Altimier and Phillips (2013) recategorized the five newborn core measures first introduced (Coughlin et al., 2009), which included 1) protected sleep, 2) pain and stress assessment and management, 3) activities of daily living (positioning, feeding, and skincare), 4) family-centered care, and 5) healing environment. To provide a more practical guide for NICU staff in delivering developmental care to preterm infants in the NICU, five core measures were expanded into seven distinct family-centered developmental core measures of neuroprotective neonatal care. This expansion allows for more emphasis on developmentally appropriate positioning and handling, optimizing nutrition and feeding, and protecting skin, all of which are critical components of providing developmental neonatal care through neuroprotective interventions.

Interventions known as neuroprotective strategies are used to support the developing brain or to facilitate the brain following a neuron injury in a way that minimizes neuronal cell death and permits the brain to heal by developing new connections and functional pathways. Neuroprotective interventions, such as family-centered developmental care, support the promotion of normal growth and development as well as the prevention of disabilities in preterm infants (Altimier & Phillips, 2013). Altimier and Phillips (2016) recently changed the term neuroprotective strategies (Altimier & Phillips, 2013) to neuro supportive care, to recommend a more proactive approach rather than waiting until brain injury or developmental delay occurs before intervening. The seven neuroprotective core measures have been kept, but to increase the efficiency of implementing these neuroprotective interventions in the NICU, more information has been added to each activity of the core measure. In order to provide neuroprotective family-centered developmental care to preterm infants and their families in the NICU, maternal roles are also incorporated into every core measure. A major concern was

also educating, coaching, and mentoring parents to become active participants in their infant's care and to support their infant's developmental goals (Altimier & Phillips, 2016).

The IDC model describes seven neuroprotective cores for family-centered developmental care as follows (Altimier & Phillips, 2013; 2016):

1. **Healing environment:** the healing environment, which minimizes the impact of the artificial extra uterine NICU environment on the developing infant's brain, is the first neuroprotective core measure described in the model. It entails managing the physical environment of space, privacy, and safety, as well as the sensory environment of temperature, touch, proprioception, smell, taste, sound, and light, to ensure the stability of the infant's autonomic, sensory, motoric, and state regulatory systems. Through maternal participation in caring for preterm infants, neuroprotective interventions are included in the six senses of care for infants. During intermittent kangaroo mother care (I-KMC), a midline, flexed, contained position reduces movement, promotes sleep to reduce energy expenditure, and increases growth hormone released; thus, brain plasticity is promoted.

2. **Partnering with families:** partnering with families is the second core measure. Parents will be considered vital members of the caregiving team, with access to their infant 24 hours a day. Parents will be supported in their role as the most important caregivers for their infants. The NICU environment will educate families on how to understand their infant's behavioral cues, how to provide developmentally appropriate positioning and handling, and how to provide active listening as parents process their shock, anger, and grief over the loss of a normal pregnancy and/or normal healthy term infant, assisting them in healing the wounds of interrupted bonding with their infants. The concept of partnering with families in the NICU implies that the family has the most influence over the health and well-being of an infant. Compassionately delivered family-integrated care with zero separation and skin-to-skin contact is the ideal model of care to encourage normal development, attachment, and bonding while also empowering parents to be equal partners on the caregiving team.

3. **Positioning and handling:** position and handling are the third core measure. The goal of this care is to maintain the infant's autonomic stability

throughout position changes, handle activities to avoid position deformity and provide care based on the infant's cues. In the NICU, therapeutic positioning is a fundamental mainstay that can influence not only neuromotor and musculoskeletal development, but also physiologic function and stability, skin integrity, thermal regulation, bone density, sleep facilitation, and brain development. Positioning the infant in a developmentally appropriate flexed position similar to the fetal position and placing them in a blanket "nest" provides feelings of security as well as boundaries to push up against (Mefford & Alligood, 2011; Zimmerman & Bauersachs, 2012). Handling infants should be done slowly and modulated, with the infant's extremities flexed and contained. Infant-driven cues should be used for optimal caregiving practices to help reduce energy expenditure, allowing energy to be saved for growth.

4. **Safeguarding sleep:** to promote normal sleep patterns, the fourth core measure is to safeguard sleep. The following are some neuroprotective strategies for NICU infants: 1) protect sleep cycles, especially REM sleep, 2) avoid sleep interruptions, 3) protect the eyes from direct light exposure, 4) provide some daily exposure to light, preferably shorter wavelengths for entrainment of the circadian rhythm, 5) protect sleep cycles, 6) avoid high doses of sedative drugs, and 7) provide developmental care appropriate for the infant's age and maturation. The goal of this care is to assess the sleep-wake state before beginning any caregiving activities, as well as to extend uninterrupted sleep periods. Assessing the sleep-wake state and promoting noiseless sleep are examples of neuroprotective care. All activities encourage the infant to rest and, as a consequence, energy conservation, promoting healing and growth.

5. **Minimizing stress and pain:** to promote self-regulation and neurodevelopmental organization, the fifth core measure is to minimize stress and pain. Reducing abnormal stress responsiveness, which helps preserve existing neuroplastic capacity, is one of the many neurologic benefits of minimizing stress in preterm infants. In the NICU, the purpose of this care is to promote self-regulation, and neurodevelopmental organization, and to reduce excessive stress and pain. Non-pharmacological support, including kangaroo mother care and facilitated tucking, is included in neuroprotective interventions, as are all minor invasive interventions.

All of these activities minimize stress and energy expenditure, which improve preterm infants' healing and growth. A systematic review of 51 randomized controlled trials found sufficient evidence to recommend kangaroo care, non-nutritive sucking, and swaddling/facilitated tucking interventions, as well as rocking/holding for pain reactivity and immediate pain-related regulation, which influence positive neurobehavioral states (Ramachandran & Dutta, 2013).

6. **Protecting skin:** the sixth core measure is protecting skin, which maintains the infant's skin integrity from birth until discharge. The purpose of this care is to provide developmentally appropriate infant massage. Developmentally appropriate infant massage promotes relaxation, bonding, and attachment in infants. One study used mothers as therapists and found that both professionals and mothers performing preterm infant massages had similar results.

7. **Optimizing nutrition:** the seventh core measure is optimizing nutrition, which is accomplished by individualizing all feeding care practices. This care is designed to promote breastfeeding. Infant characteristics that promote breastfeeding, provide support, and encourage mothers to maintain expressed breast milk (EBM) supply are all important for maintaining nutritional intake and supporting growth.

In six countries, the NIDC model was tested across the parent-child care continuum and received positive feedback. The readiness to practice developmental care, the availability of the resources required to implement developmental care, and the representation of developmental care as a standard of care were all put to the test as part of the NIDC model. According to a qualitative study (Altimier, 2011), nurses' input supported this approach, stressing the necessity of family involvement as a critical developmental principle. Parents should be involved in all core measures to be a member of the team working to promote the health of their infants. Further testing in well-designed research studies will help to ensure that developmentally supportive practices are successfully integrated (Altimier, 2011).

Review of neurodevelopmental care interventions

From the literature reviews, it was found that many types of interventions related to preterm infant neurodevelopmental care (Benzies, et al., 2013; Brecht et al., 2012; Brett et al., 2011; Burke, 2018; Puthussery et al., 2018; Vanderveen et al., 2009) as follows:

1. Characteristics of intervention

From the reviews, the effectiveness of interventions provided during NICU hospitalization, including developmental care intervention, positioning, clustering of nursery care activities, modification of external stimuli, and individualized developmental care intervention (Symington & Pinelli, 2006). It includes the Newborn Individualized Developmental Care and Assessment Program (NIDCAP) (Als et al., 2011), Maternal Participation Program (MPP) (Namprom et al., 2018), Mother-Infant Transaction Program (MITP) (Milgrom et al., 2013), Modifies environment. In essence, sound and light such as NICU noise reduction (Almadhoob & Ohlsson, 2020), skin to the skin contact (Conde-Agudelo & Díaz-Rossello, 2016), and early intervention related to parent's participation or involvement in their infant care (Vanderveen et al., 2009), The parent participation in the NICU can mitigate stressful exposures. Facilitated tucking, breastfeeding, and skin-to-skin care have shown to decrease stress and pain experienced in this population (Castral et al., 2008; Cignacco et al., 2007; Liaw et al., 2012), and brain development can be optimized by having parents engage in the NICU (Pineda et al., 2018).

It can be classified into four characteristics, including psychosocial intervention, modifying the environment, psycho-education, and health care professional and family support. Also, it found two types of interventions, which were single interventions and comprehensive interventions.

2. Durations of interventions

The interventions range in duration from 30 minutes to continuously until NICU discharge (Aita et al., 2021). The length of time was based on the complexity of the intervention and the outcome. The intervention doses were determined by the type of preterm infant, with older preterm infants receiving fewer doses than younger preterm infants. It can be concluded that there were various durations and treatments because the durations and doses of the interventions varied depending on

the complexity of the intervention, the type of preterm infant, and the outcome measurement. Additionally, a comprehensive intervention duration and dose of two hours per sessions for four times within one week was found to promote neurobehavioral development in preterm infants (Namprom et al., 2018).

3. Intervention components

The intervention components classified according to Benzies et al. (2013) have been organized intervention components based on a bioecological framework into three categories: 1) parent education consisting of aspects such as teaching, sensitization, training, or awareness creation; 2) parent psychosocial support consisting of guidance, encouragement, or other forms of support; and 3) infant support/therapeutic developmental interventions consisting of infant care or therapy elements. These are three critical components for improving parent and preterm infant outcomes.

According to Burke (2018)'s study, parent education is a component of all interventions. The most effective and efficient way of educating and getting parents involved in developmental care needs to be a priority. Using three key elements as a guideline for developing and testing interventions for parents of preterm infants was recommended. Besides, a systematic review of the effectiveness of therapeutic behavioral interventions for parents of low-birth-weight preterm infants by Brecht et al. (2012) indicated short-term intervention to improve parent-infant interaction. The findings of this review reinforce the importance of early intervention, holding/touching, and parent involvement as keys to success. Given that parent education is a component of all interventions, determining the most efficient and efficacious way of educating and getting parents involved in developmental care needs to be a priority.

4. Outcome measurements

In this review, the outcome measurement was divided into three groups, 1) Infant outcomes include neurobehavioral development, length of stay, and growth, which includes weight gain, head circumference, and brain structure; 2) parent outcomes include parenting stress, maternal anxiety, and maternal self-efficacy; and 3) parent-infant outcomes including preterm infant growth, neurobehavioral development, and parental stress. The results of the interventions showed that some

of the programs could enhance preterm infant growth and neurobehavioral development, and some could improve parent-infant interaction.

In summary, there is still a gap in research, which are a few studies that include all three crucial components (parent education, parent psychosocial support, and therapeutic infant development support) in the intervention to measure parent and infant outcomes. Yet, there hasn't been one program that could promote parental participation, increase parental self-efficacy, and enhance preterm infant growth and neurobehavioral development together. Moreover, most of the programs were developed by other countries, and they might not fit into our Thai context. Furthermore, Thai mothers reported participating in their preterm infant care in NICU at a moderate level, Thai parent desire to be close to their preterm infants but lack of confidence in providing care for their preterm infants, and no comprehensive intervention specifically for parental participation in caring for preterm infants in Thailand.

Therefore, the researcher's purpose is to conduct a mixed-method design to develop and test the effectiveness of the comprehensive preterm infant developmental care program on parental self-efficacy, growth, and the neurobehavioral development of preterm infants during hospitalization. The development of a further intervention to enhance the growth and neurobehavioral development of preterm infants and increase parental self-efficacy should integrate the synactive theory (Als, 1982), the neonatal integrated developmental care model (Altimier & Phillips, 2013; 2016), research evidence, and the perspective of parents through in-depth interviews. The mixed-method design would be applied to a deep understanding of the context of parent participation in preterm infant developmental care in the NICU by a qualitative method and test the effectiveness of this intervention by a quantitative method.

The new intervention for enhancing preterm infant growth and neurobehavioral development and parental self-efficacy was developed based on the synactive theory of development, the neonatal integrative developmental care model (NIDC), research evidence, and parents' perspective that is a comprehensive preterm infant developmental care program (CPIDCP). The CPIDC program consisted of six stages divided into four sessions, which included: 1) creating a

trusting relationship and goal setting, 2) understanding the context of the parents and preterm infants, 3) coaching the parents to develop their self-efficacy in preterm infant care, 4) promoting and supporting of therapeutic infant development, 5) providing the parents' psychosocial support and 6) reflecting and evaluating. This program's intervention was conducted in 4 sessions within one week. The outcomes will be measured three times at pre-intervention (day 0), post-intervention (day 14), and follow-up (day 28). The researcher expects that this program will provide good outcomes for preterm infants and parents by improving growth, neurobehavioral development, and parental self-efficacy.

CHAPTER 3
RESEARCH METHODOLOGY

This chapter presented the research method of this study, including research design, population and sample, the settings, research instrumentations, and a description of the intervention, protection of human rights, data collection procedures, and data analyses.

Research design

A mixed-method was used to develop an intervention for comprehensive preterm infant developmental care (CPIDC) and tested its effects on parental self-efficacy, preterm infant growth, and neurobehavioral development. The intervention in the current study was developed based on a synactive theory, related research evidence, and the perspectives of parents in a Thai family context. Moreover, the new developed intervention was initially tested through a pilot study to shape the intervention. After that, the effectiveness of the intervention was tested with a randomized control trial.

Research phases

In the current study, the new intervention was developed and tested, comprising two phases. The first phase was intervention development, starting with gathering an understanding of the current situation through interviews. The data gathered from interviews was then formulated and the intervention was created, thereafter the pilot study was conducted to test the feasibility of the intervention. The second phase was an investigation of the new developed intervention's effectiveness using a quantitative research design approach.

Phase I: Intervention development

1. Understanding the current situation of the preterm infant developmental care during NICU hospitalization.

This phase focused on understanding the current situation of parents' participation in preterm infant developmental care during NICU hospitalization. An

in-depth interview with the parents was conducted to explore their needs, beliefs, and competency of participation in hospitalized preterm infants.

2. Formulating the new intervention

The new intervention, the CPIDC program was then developed based on the integration of related theoretical, scientific knowledge, and research evidence. The gathered perspectives from parents were also integrated into the formulation of the CPIDC program. With the integration of such perspectives, it was presumed that the intervention was improved and more suitable for use in a Thai context.

3. Pilot study

A pilot study was conducted to test the feasibility of the CPIDC program. The program was revised based on gathered qualitative and quantitative data via a pilot study. The participants in this step were ten parents with their preterm infants (known as parent-preterm infant dyads) who were currently hospitalized in the NICU at Chonburi hospital. The participants were chosen using a convenience sampling technique, and they were asked to apply the CPIDC program to their care of the preterm infant. After completion of the program, they were in-depth interviewed and asked to reflect on their participation in the program.

Phase II: The effectiveness test of the new intervention

The revised CPIDC program was tested for effectiveness including parental self-efficacy, preterm infant growth, and neurobehavioral development. A two-group pre-posttest and a follow-up randomized control trial were applied and conducted in this phase.

Population and sample

Phase I: Intervention development

The target populations of this study were parents of preterm infants in the post-partum period when they visited their infants in the NICU at Chon Buri Hospital. They were recruited for this study.

Participants: A purposive sampling technique was used to select the participants, the inclusion criteria were set to recruit them from the target population including: a father or mother who has a preterm infant with a gestational age of between 28–32 weeks whose currently hospitalized in the NICU for the first time,

had a Clinical Risk Index for Babies (CRIB) score ≤ 15, and had a birth weight less than 2,500 grams, had an age ≥ 18 years, has no experience of caring for premature birth, and communicates in Thai fluently. The number of participants in this phase was ten parents, based on the saturation of data.

Phase II: The effectiveness test of the new intervention

The target population of this study was parent-preterm infant dyads who were presently receiving healthcare services in the NICU at Chon Buri Hospital.

The participants were recruited from the target population and subsequently randomly assigned to the experimental group and the control groups based on the following inclusion criteria:

Inclusion criteria: 1) a father and mother having preterm infant hospitalized in the NICU, age ≥ 18 years, had no experiences of caring for premature birth, and was able to speak, read, write, and understand Thai fluently, 2) a preterm infant with gestational age between 28 - 32 weeks, birth weight less than 2,500 gram, absence of critical conditions such as intraventricular hemorrhage (grades III and IV) or having no evidence of severe birth asphyxia or congenital anomalies, had a singleton pregnancy, being the first time hospitalized in NICU with Clinical Risk Index for Babies (CRIB) score ≤ 15, had parents participation in the study.

Exclusion criteria: Exclusion criteria including infant's worsening conditions such as RR > 60 bmp or < 30 bmp or apnea, HR> 180 bpm or > 20% persist ≥ 10 minutes, BT >37.5 or < 36.5, BP < 5^{th} percentile or systolic BP < 2 SD.

Discontinuation criteria for participant: Discontinuation criteria included 1) infant death before the end of the program or, 2) the parent was not able to continue in any session of the intervention.

The sample sizes

A G* Power program version 3.1.9.4 was used to calculate the sample size. In the current study, repeated measures ANOVA (within-between interaction) was considered for use as a statistical method. The level of significance at .05 with power at .80 was set, selected the effect size from a previous study (d = .52) was also set (Namprom et al., 2018). The effect size was calculated by mean: $\bar{X}_E$ (experimental group) – mean: $\bar{X}_C$ (control group)/ standard deviation: *SD* (control

group) (Glass, 1976). From the previous study (Namprom et al., 2018), mean growth velocity of preterm infants from day 14 to day 28 in the experimental group was 16.68 and in the control group was 13.65 (*SD* = 5.86) as a result the effect size was .52. The effect size was then transformed into *F* tests by the converting effect size program, which was equal to .26 (Lenhard & Lenhard, 2016). According to the sample size calculation, 36 persons were identified. To adjust the number of participants, drop out, or missing data, an additional 25% was added to the sample size, thus a total of 46 parent-preterm infant dyads was the minimum number to be recruited (Suresh & Chandrashekara, 2012). Lastly, they were randomly assigned into two groups, comprising 23 participants in each group.

Recruitment Procedures

Recruitment procedures were performed at the NICU I and II, as follows: 1) parents and their preterm infants on the first few days of the infants' admission date were approached and screened for their eligibility, 2) the researcher verified the potential participants who met the inclusion criteria, they were then informed on a one-to-one basis about the study's purpose, method, and participation in the current study. Voluntary participants were asked if they had any questions or concerns, and then the consent form was signed once they agreed to participate. After obtaining the consent form, the participants who met the inclusion criteria and agreed to participate in the study were randomly assigned to experimental and control groups.

Randomization procedures

This study was a cluster randomized controlled trial that included activities such as setting the ward environment, where all wards had to be organized, and caring for the neurodevelopment of preterm infants with nurses. To prevent contamination, it was necessary to randomize the wards rather than the individuals, which was a practical reason for using group randomization rather than individual randomization (Cook et al., 2016; Harris, 2021; Moberg & Kramer, 2015). The randomization was performed at the NICU by research assistants. There were two types of research assistants in the current study, which were: 1) the research assistant A (RA-A) randomly assigned the sample, and 2) the research assistant B (RA-B) collected the data. The RA-A prepared slips of paper with "E" represented as the experimental group, and "C" represented as the control group. The RA-A drew the letters "E" and "C" on the paper, 1 piece each

in a closed box. This randomization was drawn from NICU I and II, and either NICU I or II was the experimental group or the control group by the RA-A using simple random sampling without replacement technique. The participants were then allocated to the control or experimental group from the NICU setting. To minimize bias, the allocation is blinded to the enrolled RA-B and participants. The RA-B was blinded to the study group and had no accessibility to the data or information regarding group allocation.

The setting of the study.

Chon Buri Hospital was chosen as the study setting. This hospital is the healthcare facility providing tertiary care services for the population who lives in Chonburi Province mainly and those who live in provinces surrounding the eastern part of Thailand, with 850 inpatient beds. The NICU I and II at Chon Buri Hospital receive both term and preterm infants with health problems after birth who need intensive treatment, close monitoring, and observation. These infants are needed to be diagnosed and treated as soon as possible, and special medical equipment is required to monitor any changes in their symptoms. Some infants may need emergency procedures such as umbilical catheterization, chest drainage, and blood exchange. The care of this group of patients requires a specialized expert team working at the NICU, including four neonatologists who rotate the cycle of care for each ward, one person per month, three residents covering both NICUs, and nineteen registered nurses per ward, and four nurse aids per ward.

The principles of holistic newborn care are applied in both NICUs in accordance with the Infant Care Criteria Department of Health. Each NICU has eight beds for ill infants and provides kangaroo care activities in each NICU. The ratio of nurses to ill infant care in the NICU is 1:1 to –1:2, depending on the infant's condition. The most common patient groups were preterm infants with low birth weight and requiring ventilator support. Both NICUs care for ill infants up to one month of age and weigh less than 2,500 grams. The room temperature in the NICUs was controlled by the air conditioner, which is adjusted to 25 degrees Celsius. For the light control, NICU nurses use the blanket cover incubator to protect the light and turn off the light once per shift, lasting 1 hour each time. Sound control: NICU nurses

control the volume of the monitoring equipment and telephone. Every infant patient who has been hospitalized in the NICU is kept in an incubator to maintain their body temperature. The majority of infant patients' airway is maintained with an endotracheal tube and a ventilator due to the symptoms affecting their respiratory system, so the vital signs and oxygen saturation must be closely monitored. In addition, all infants who are able to consume milk receive their mother's milk via orogastric tube feeding. NICU nurses inform parents about the visit rules, which allow them to visit for 24 hours and inquire about the infant's condition over the phone when the mother was discharged to her home. Moreover, they provide information about breastmilk collection, breastfeeding, and breast pumping and encourage parents to visit their ill infants as often as they could. Preterm infants are further transferred to a sick newborn unit when they have stable physiological conditions and no intubation is needed. Preterm infants in this setting receive healthcare from the same health care providers for 28 days after birth.

Research instrumentations

The instruments in this study consisted of instruments for 2 phases, which were described as below.

Phase I: Intervention development

The instruments for data collection of the intervention development phase consisted of 2 parts, including a demographic data record form for parents and an interview guide for participants' perceptions.

1. Demographic data record form

The parent's general information contained a record form of demographic characteristics of the father or mother. The required data in this form included age, current marital status, education, occupation, monthly income, intention to plan pregnancy, antenatal care, complications in pregnancy, type of delivery, separation time, number of children, experiences of a preterm infant care, and significant person.

2. An interview guide of participants' perception

The interview guide was developed based on the synactive theory, the neonatal integrative developmental care model, and a review of related literatures regarding enhancing the neurobehavioral development of the preterm infant. It was

used for interviewing purposes and to help explore the parent's needs, beliefs, and competencies for participation in preterm infant care during hospitalization. They were interviewed with a semi-structured interview method. Examples of interviews included 1) How do you plan to visit your preterm infant? What do you do when you visit your preterm infant? Why do you do that? 2) How do you plan to participate in your preterm infant during NICU hospitalization? Please descript this. How do you feel when you participate in your preterm infant care? 3) What kind of health care service in NICU do you need to improve for helping you participate in your preterm infant developmental care? 4) What is the obstacle to participation in developmental care between you and your preterm infant? And why? 5) What are the strategies or factors that will help you to participate in your preterm infant care? And why? The interviewed data were collected for analysis of the current situation of parent participation in preterm infant developmental care during hospitalization. Each interview was recorded with an audiotape length of approximately 45-60 minutes per case. The transcriptions were immediately done right after the interviews were completed.

Phase II: The effectiveness test of the new intervention

In this phase, the research instruments were used to collect the data and conducted the intervention. The details of such instruments were described below.

1. Instruments for data collection

1.1 The infant's demographic data record form comprised information including gestational age, gender, birth weight, type of feeding, diagnosis, complications, duration of hospitalization, and duration of NICU stay. Infants' data were collected from medical records by the researchers. The Clinical Risk Index for Babies (CRIB) was used to assess the severity of the infant's illness. The CRIB was developed by The International Neonatal Network (1993), and the CRIB scores were given for birth weight, gestational age, the maximum and minimum fraction of inspired oxygen, maximum base excess during the first 12 hours, and the presence of congenital malformations. Higher total scores indicated the more severity of an infant's illness. The scores were further classified into four levels as follows: level 1: 0 to 5 points; level 2: 6 to 10 points; level 3: 11-15 points, and level 4: above 15 points.

1.2 The parent's demographic data record form included age, current marital status, education, occupation, monthly income, intention to plan pregnancy, antenatal care, complications in pregnancy, type of delivery, separation time, number of children, the experience of preterm infant care, and significant person.

1.3 The Neonatal Neurobehavioral Examination (NNE) (Morgan et al., 1988) was used to measure the neurobehavioral functions of preterm infants with increasing age. It consists of 27 items divided into three sections: 1) tone and motor patterns, 2) primitive reflexes, and 3) behavioral responses. Each section comprised nine items scored on three-point scales (1-3) of rating, 3 = response expected at term (37-42 weeks), 2 = response expected at 32-36 weeks of gestation, and 1 = response expected before 32 weeks of gestation. In the behavioral responses section, each subtest was also given a cluster score. The subtest was assigned a cluster score of 3 if two of the three items in the subtest were scored as 3, a score of 1 if two of the three items were scored as 1, and a score of 2 for all other combinations. The total score ranged from 27 to 81. The higher overall score indicated better gestational maturation and neurobehavioral status. The reliability of the NNE Scale subsection was tested by the developers and ranged from .93 to .97, which indicated good reliability. This instrument was used with the permission of the developers.

1.4 Preterm infant growth measurements consisted of the body weight, head circumference, and length of a preterm infant. The instruments that were used to measure the growth of preterm infants were described as follows:

1.4.1 A digital weight scale: A digital weight scale was used to measure an infant's weight, Seca model 727 in grams, the accuracy is ±2 grams. A gram was used as the measuring unit with the precision of two decimal digits. The scale was used to measure the bodyweight of preterm infants by the research assistant and the measurement was done at the same time daily, and a tare function where the scale could be reset to zero. Moreover, for accuracy and precision, this equipment was calibrated with the measuring instruments according to the ISO/IEC 17025 standard by medical technicians from N Health company. This equipment had passed the calibration criteria and was re-calibrated once every year according to the standards of the measuring instrument. Weight gain was the gram unit of weight over a specified time between the initial weight (W1) and the weight at the second time (Wn). To

calculate the weight gain, a formula of weight gain (grams) = Wn - W1 was used. The weight gain velocity was calculated as (Wn-W1)/(Dn-D1), and the growth velocity as GV = [1000 x ln (Wn/W1)]/(Dn-D1). The higher score indicated better growth.

1.4.2 A measuring tape: It was used to measure the head circumference and length of preterm infants in centimeters. The higher number of centimeters indicated better growth. To minimize the error of measurement, the equipment was used to measure, and the measurement was done at the same time daily by the same assessor. To calculate the length gain, a formula of length gain (centimeters) = Ln -L1 was used, and the head circumference gain (centimeters) = Hn - H1.

1.5 The Perceived Maternal Parenting Self-Efficacy (PMP S-E) was developed by Barnes and Adamson-Macedo (2007). The researcher translated it into the Thai language. The scale measures mothers' perceptions of their ability to understand and care for their hospitalized preterm neonates. The scale consists of 20 items divided into four subscales: caretaking procedures, evoking behaviors, reading behaviors, and signaling and situational beliefs. Each item was answered on a 4-point scale from 1 = strongly disagree, to 4 = strongly agree. The total score was in the range of 20–80. The higher scores indicated a higher level of maternal self-efficacy. The internal consistency reliability of the PMP S-E tool was .91. The external/test-retest reliability of the scale measured at 10 days was .96. This instrument was used and translated with the permission of the developer.

2. Instruments for intervention

2.1 The Comprehensive Preterm Infant Developmental Care Program (CPIDCP) was developed by the researcher based on synactive theory (Als, 1982), the conceptual framework of the NIDC model (Altimier & Phillips, 2013; 2016), related research evidence, and perspectives of parents. The pilot study was applied to test the feasibility and acceptability of the intervention for modification. The CPIDC program consisted of six stages divided into four sessions, which included: 1) creating a trusting relationship and goal setting, 2) understanding the context of the parents and preterm infants, 3) coaching the parents to develop their self-efficacy in preterm infant care, 4) promoting and supporting of therapeutic infant development, 5) providing the parents' psychosocial support and 6) reflecting and evaluating. This

program's intervention was conducted in 4 sessions within one week. The program started on day 1 or day 2; subsequent days were 3, 5, and 7. The details of this program were clearly described in the session of the description of the intervention.

2.2 My preemie handbook was developed by the researcher and provided to parents of preterm infants with the aim of guiding and supporting them in caring for preterm infants. The "My Preemie" handbook could be accessible via mobile application by QR code scanning, therefore the parents could use it easily and conveniently. The printed manual of the "My Preemie" handbook was also distributed to the parents who cannot access the application, and the manual can also assist them in opening the link and accessing the application completely. This handbook was given to the participants on the first to the second day after the admission of the preterm infant to the NICU. The contents of the "My Preemie" handbook include: 1) Preterm infant characteristics, 2) Catch up on the growth of the preterm infant, 3) Development of preterm infant characteristics, 4) Parental participation in caring for preterm infant activities, 5) Breastfeeding, 6) Intermittent kangaroo parent care, 7) Promoting odor, test sucking, and swallowing reflex, 8) Sleep-wake pattern, 9) Positioning and handling, 10) Stress and stability cues, 11) Minimizing stress and pain, and 12) Infant massage.

2.3 The preemie developmental care handbook was provided to guide and support the nurses in caring for preterm infants. The "Preemie developmental care" handbook was accessible via mobile application by QR code scanning; therefore, the nurses could use it easily and conveniently. A printed manual was distributed to assist those who were not able to access the application in opening the link and accessing the application completely. This handbook was developed by the researcher through literature reviews and its contents focused on the NICU environment arrangement.

2.4 The preterm infant development daily plan, entitled "My Lovely Preemie," was designed by the researchers. This tool aimed to record the progression of preterm infant growth and development in a day. It could also be used to monitor or check whether the parents visit their preterm infant and participate in the preterm infant's care. A daily parent could form a good bonding attachment with their preterm infant.

The instruments for data collection (demographic data record form, interview guide of participants' perception) and instruments for intervention (CPIDC program, my preemie handbook, preemie developmental care handbook, and preterm infant development daily plan) were verified by five experts, consisting of two neonatologists, two pediatric nursing instructors, and one advanced practice nurse in pediatric nursing. The experts verified the instruments with consideration of content, appropriate language, and arrangement. The instruments were then revised according to the experts' recommendations.

After being improved from the perspective of the parents, the CPIDC program was returned for verification by five experts.

Translation instrument

The Perceived Maternal Parenting Self-Efficacy (PMP S-E) questionnaire was translated into Thai by using the translation and back-translation method (Yu et al, 2004; Sousa & Rojjanasrirat, 2010). This cycle was continued until the culturally equivalent meaning was achieved between the original and Thai languages. The process of back-translation includes a cycle of four steps as follows:

1. Forward translation of the original instrument into the target language. The English questionnaire was translated into Thai by two bilingual health professionals. They translated the contents to convey the precise meaning, and statements from the original measures. The Thai linguistic usages were applied in a way that captured and clearly relayed the main subjects or ideas from the English originals.

2. Two reviewers compared two translated versions of the instrument and both translated versions with the original instrument. The translated version of PMP S-E and the original version was compared by the major advisor and researcher for ambiguities and discrepancies in wording, sentences, meaning, linguistic congruence, and cultural relevancy. Any ambiguities and discrepancies were resolved by asking the two translators from step 1 and the two reviewers from step 2. This process produced the initial Thai version of PMP S-E.

3. Backward translation of the Thai version of PMP S-E into English. The revised Thai version of the PMP S-E questionnaire was blindly translated back into

English by two bilingual health professionals. Likewise, translators had no previous knowledge of the original instrument.

4. Comparison of the original instrument and the back-translated version. Both versions of the instrument were compared by the major advisor and a researcher for words, consistency of grammar, structure, and cultural relevancy. The major advisor and researcher discussed until they agreed that the two versions of the instrument were matching and had no errors in meaning.

Psychometric properties of research instrument

Reliability

The measuring outcome instruments of this study were the Neonatal Neurobehavioral Examination (NNE), and the Perceived Maternal Parenting Self-Efficacy (PMP S-E). The reliability of NNE was tested with an inter-rater method among three preterm infants for confirmation of the agreement or consistency among scores from all research assistants. The inter-rater process was conducted by the researcher and research assistants, who independently used the scale to examine the same preterm infants at the same time. The calculation index of agreement of inter-rater observer reliability of .90 is acceptable (Morgan et al., 1988). The inter-rater reliability of NNE, which was obtained in this study, was .93.

An internal consistency reliability, using Cronbach's coefficient was tested on 15 parents of a preterm infant for evaluating the reliability of the Perceived Maternal Parenting Self-Efficacy (PMP S-E). The Cronbach's alpha reliability of the PMP S-E was .94.

Description of intervention

The Comprehensive Preterm Infant Developmental Care Program (CPIDCP) was developed by the researcher based on synactive theory (Als, 1982), the conceptual framework of the NIDC model (Altimier & Phillips, 2013; 2016), related research evidence, and perspectives of parents. The details of each developmental stage were described below:

Stage 1: Creating a trusting relationship and goal setting

The objectives of this stage were to build a trusting relationship between the researcher and the parents of a preterm infant, to create parents' awareness of being

an essential person to their preterm infant, and setting goals for preterm infant developmental care. The researcher introduced herself, described the objectives of the study, and outlined the program. The information regarding the NICU policy and NICU environment were then provided to ensure the preterm infant condition. According to the perspective of parents, family support enhances their participation in preterm infant developmental care; fathers expressed a need for preterm infant care information alongside mothers. Therefore, in each session, the researcher invited fathers to participate in this study alongside mothers, then informed fathers about preterm infant care and invited them to interact with their infants. Furthermore, the researcher informed mothers and fathers about medical equipment for preterm infants. Then, the researcher explained the importance of parents as an essential person for their infants while in hospitalization. Furthermore, they receive more information regarding the goal setting for the parent based on reality about parent participation in preterm infant developmental care and being encouraged to set a group of care for their preterm infant via line application to share their experiences. Moreover, the Line application was used to contact with the parents in case they have any questions or points of concern about participation in preterm infant care.

Stage 2: The understanding context of the parents and preterm infants

The objective of this stage was to understand the parents' expectations, needs, and reading preterm infant cues. In this stage, the parents were encouraged to express their feeling about the situation of their preterm infant. The feeling expression was presumed to help the parents to understand their feelings, participation in preterm infant care, preterm infant cues and their response to their preterm infant, and their infant problems in this situation. The researcher listened deeply with sympathy and respect for the belief and ability of the parents. After that, they were asked to discuss with the researchers regarding the obstacles to participation in caring for preterm infants during NICU hospitalization. They were encouraged to identify and assess their individual need for involvement in their preterm infant care during hospitalization.

Stage 3: Coaching the parents to enhance parents' confidence in preterm infant care

The objective of this stage was to enhance the parents' knowledge and self-efficacy in preterm infant care. This stage consisted of coaching and practicing exercises. The educational training, including the healing environment, positioning and handling, safeguarding sleep, minimizing stress and pain, protecting skin, and optimizing nutrition were provided. The parent practiced following the teaching topics each day. The parents practiced training tactics including demonstration and return demonstration strategies. Each practice was focused on one-by-one coaching between the researcher and the parent, and the practice was taken in a hospital private room and at bedside care.

Stage 4: Promoting and supporting therapeutic infant development

The objective of this stage was to enhance the neurobehavioral development of preterm infants. The researcher promoted therapeutic infant development care collaboratively with staff nurses to organize activities to enhance the development of infants. The activities of nurses in therapeutic infant development care consisted of:

1. Optimizing nutrition; NICU nurses promoted and fed mother's milk to hospitalized preterm infants. Provided the taste and smell of breast milk, if available, with gavage feeding. Ensure that the infant receives adequate nutrition and fluids.
2. Healing environment; For the NICU environment arrangement, the researchers asked the NICU staff for cooperation to put a blanket over the incubator to prevent light that would interfere with the sleep pattern of the infant and set a timer to turn the light on and off, cyclic like day and night, as well as to measure and record light intensity once per shift. The sound was also controlled; the researcher also asked the NICU staff for cooperation to measure and record the sound pressure level in the wards once per shift. Controlled the volume of the monitoring equipment, telephone, and requested cooperation to refrain from using a personal mobile phone in the ward. Provided care in an incubator until the infant can maintain its own temperature. Facilitated skin-to-skin contact (SSC) and encouraged zero-separation between parents and infants.
3. Safeguarding sleep; Avoid sleep interruptions caused by bright lights, loud noises, and unnecessary disturbing activities. Protected quiet sleep states by

providing flexibility in the timing of care and recording the sleep of the infant once per shift. Set time for a quiet time in the NICU by setting the alarm sounds of various medical devices to a low level and turning off the lights in the ward. Set time for a quiet time for 1-2 hours at a time as follows: 12.00-13.00, 21.00-22.00, 3.00-5.00.

4. Positioning and handling; NICU nurses arranged a preterm infant's position by maintaining a midline, flexed, contained, and comfortable position at all times utilizing appropriate positioning aids and boundaries (nest). Reposition the infant with care and minimally every 4 hours.

5. Minimizing stress and pain; Provided individualized care in a manner that anticipates, prioritizes, and supported the needs of infants to minimize stress and pain. Performed the pain assessment to evaluate the need for pharmacologic support, provide non-pharmacologic support with all minor invasive interventions, provided positioning to promote comfort, and provided nursing care with a gentle and soft touch.

6. Protecting skin; Minimizing the use of adhesives and using caution when removing adhesives to prevent epidermal stripping. Avoid soaps and routine use of emollients.

In addition, the parents were allowed to visit and participate in caring for the preterm infant. The researcher gave the "Preemie developmental care" handbook to the nurse staff. This handbook was provided to the nurse staff to guide the intervention process.

Stage 5: Providing the parents' psychosocial support

The objective of this stage was to support the parents in their participation in preterm infant care. The researcher planned and set the time for the parents to provide care for their infant and reduce parent stress. The researcher assisted, facilitated, and encouraged parents to be involved in their infant's care. The researcher stayed by the parents' bedsides to assist them if they lacked confidence in their caring abilities or had difficulty performing caring activities. The researcher assisted in care practices through repeated training and facilitated participation in implementing care practices. The researcher provided emotional support to the parents, positive feedback, one-to-one support through Line application, and telephone counseling depending on the availability of communication devices.

Stage 6: Reflecting and evaluating

The objective of this stage was to reflect on and evaluate the program. The parents were invited to reflect on the received activities of the program. Finally, the researchers discussed the findings, gave the commendation, and thanked them for participating in the program.

Research assistant training

The research assistants B (RA-B) had to get a master's degree or certificate in neonatal nurse practitioner training and got at least 2 years of work experience in a NICU. Prior to initiating RA training, the researcher discussed the preterm infant neurodevelopment examination with the experts in the field to ensure the scoring was accurate and precise. The researcher described the meaning of each item and gave the manual of instrument administering to the RA- B. Then, the inter-rater reliability was tested by the researcher and the RA-B by collecting the neonatal neurobehavioral development data independently and concurrently from the same three preterm infants at the same time, from which the inter-rater reliability of .93 was obtained.

Control threat of internal and external validity

1. Maturation may be a threat for preterm infants because they improve their development over time. It was difficult to assess the impact of an intervention in a one-group design. The addition of a control group, whose maturation was identical to that of the intervention group could prevent the threat of maturation.

2. Because the data collecting duration was approximately one month's corrected age of the preterm newborn, which was considered a long time causing a risk of mortality. Therefore, there was a high possibility that the study might be dropped. As a result, prior to beginning data collecting, a good relationship with participants was established. The researcher created strategies to encourage both groups of parents to participate until the study was completed, such as giving praise and motivating them to do so.

3. The threat of resentful demoralization possibly occurred because the control group might think that they did not receive the same level of nursing care as those in the experimental group. The control group might have thought they received valuable standard routine care, whereas the experimental group did not know the beneficial outcome. Therefore, the participants in both groups might feel that they

received unequal nursing care. The threat of demoralization was prevented by providing the information prior to a random assignment to classify the participants into experimental and control groups.

4. The threat of data contamination might be possible because participants from the control and experimental groups had been admitted at the same time. The parents in both groups have met and discussed each other due to the fact that the control group ward and the experimental group ward are just next door. Furthermore, nurses in the control and experimental groups share the same living room, allowing them to discuss developmental care techniques, which might have an impact on the study's outcome. This threat could be reduced by separating the experimental group's implementation area from the private room.

Protection of human rights

After the research project proposal was approved by the Institutional Review Board committee, Burapha University (code G-HS 102/2563), Chon Buri Hospital (code 150/63/O/q), and Thai Clinical Trial Registry Code (TCTR20210513004), the researchers informed the participants about the research purposes, processes, and benefits of this study. When they were willing to participate in the study, the informed consent was signed. Furthermore, the participants were informed that the data obtained from them would be kept confidential and they were allowed to ask any questions and share their opinions openly. Participants' potential risks and benefits were notified and prepared in order to protect them from any potential threats. After the study was published, the data was destroyed. They were informed that if they had any concerns during the study and needed to stop participating, they had the right to do so at any time without explanation.

Data collection procedures

Preparation

1. Data was collected after receiving approval from the Institutional Review Board committee, Burapha University, and Chon Buri Hospital.

2. The researcher sent a letter to Chon Buri Hospital's Director to get permission to contact the participants and use the setting for data collection procedures.

3. The researcher contacted the head nurse of NICU I and NICU II in Chon Buri Hospital to explain the details of the research project in both phases and the pilot study.

4. The researcher explained the details of the research project including the research objectives, data collection procedure, benefits, and risks. Then the participants were asked to sign the consent form.

The data collection for this study was divided into two phases, including the intervention development phase and the effectiveness test of the new intervention phase. The details of each phase were described as follows:

Phase I: Intervention development

In this phase, qualitative data were collected by the researcher to gain a deeper understanding of the current situation of the preterm infant developmental care during NICU hospitalization. The procedures in this phase were described below:

1. In the first month of data collection, the in-depth interview was conducted to collect qualitative data from the parents regarding their needs, beliefs, and competency in participating in preterm developmental care by using the interview guide. The researcher conducted face-to-face, audiotape, and semi-structured interviews, and the length of each interview was approximately 45–60 minutes per participant. Face-to-face interviews were usually performed to offer the researcher an opportunity to interpret non-verbal cues through the observation of body language such as eye contact and facial expressions, thereby enhancing the interviewer's understanding of what was being said. In the end, it permits the researcher to probe and explore the meanings and understanding (Ryan et al., 2009). The researcher spent four to eight hours in the NICU each day to get familiar with the nurses to perform subsequent observations of their participation in the infant care behavior of parents. Moreover, the documentary data sources consist of nurses' notes and other medical records were used to support the data.

2. Synthesize the gathered qualitative data derived from the parents' perspectives into the new intervention aimed to promote the neurobehavioral development of preterm infants.

3. Pilot study was performed before an effectiveness test of the new intervention to confirm feasibility. Qualitative and quantitative data were collected at this stage for shaping the intervention and confirmation about the feasibility (Thabane et al., 2010). In the pilot study, 10 parent-preterm infant dyads in Chon Buri Hospital were asked to participate after the study was approved by the Institutional Review Board committee, Burapha University, and Chon Buri Hospital. The participants who met the inclusion criteria were recruited. The intervention and measurements were administered in 2 weeks, which were in sessions 1- 4 of the CPIDC program. The parents who participated in the pilot study were asked to indicate the effect of the CPIDC program and how long the period took them to complete the questionnaire. They were also asked to share if they had any questions or concerns about the study. Thereafter, the researcher conducted an in-depth interview with the participants to explore their opinion of the feasibility and acceptability of this program after finishing this intervention.

Phase II: The effectiveness test of new intervention

To prevent any bias in this phase, the research assistants were asked to collect the data. Besides, the research assistants B (RA-B) who collected the data were also blind to group assignment. The procedures of data collection in this phase were the preparation stage, implementation stage, and evaluation stage.

Preparation stage

1. The researcher contacted the staff who work in two NICUs to explain the purpose and procedures of this study.

2. The researcher prepared the room and materials for the parents and their preterm infants, such as a handbook, a daily plan of preterm infant growth and neurobehavioral development.

3. The research assistant A recruited the preterm infants who met the inclusion criteria from the registration books of the NICUs at Chon Buri Hospital. The research assistant A drew the letters "E" and "C" on the paper, 1 piece each in a closed box. The research assistant A randomly assigned either the NICU-I or NICU-II

to be the experimental group or control group using a simple random sampling without replacement technique. Then, the participants were assigned to the experimental group (23 cases) and the control group (23 cases).

4. The researcher trained all nurses who provided care for preterm infants in the experimental group and provided the preemie developmental care handbook to guide and support nurses in caring for the preterm infants.

Implementation stage

The participants were placed into an experiment group and a control group and were scheduled for the CPIDC program.

1. For pretest test, research assistants B assessed parental self-efficacy by the Perceived Maternal Parenting Self-Efficacy (PMP S-E), preterm body weight, head circumference, length, and neonatal neurobehavioral development, were measured by the Neonatal Neurobehavioral Examination (NNE) in both the control group and experimental group in the first week (at the baseline).

2. In the control group, the parent-preterm infant dyads received usual care until they were discharged one by one. In the experimental group, the parent-preterm infant dyads received usual care by NICU staff with the CPIDC program administered by a researcher one-by-one.

2.1 The control group

The participants received usual care from the NICU staff, including orienting about the rules in the unit, presenting the progress of the illness, breast pumping, and the way to keep breast milk for their preterm infant. The NICU nurses provided information about breastmilk collection, breastfeeding, and breast pumping and encouraged the parents to visit their infants as often as they could. They also encouraged the parents to touch and talk with their preterm infants and had a kangaroo care activity. Furthermore, the NICU staff used a nest to provide the preterm infant with boundaries (considered similar to the womb), mouth care with mother’s milk, feeding with mother milk, using protection light, turning off the light once per shift for 1 hour each time, protecting sleep, providing the preterm infant with as much rest as possible, and not disturbing the preterm infant when it was not necessary, reducing the pain by such as wrapping the preterm infant, soft touching the preterm infant, or providing the hand to mouth position for the preterm infant.

2.2 The experimental group

The participants received the CPIDC program, which contained activities of one week's duration, including six stages within four sessions as follows:

Session 1: On day 1 or 2 (60 minutes), the intervention focused on creating a trusting relationship and goal setting, understanding the context of the parents and preterm infants, and promoting and supporting therapeutic infant development (stage 1, 2, 4). The researcher introduced herself and described the objectives and outlines of the program. The researcher provided information to the parents about the NICU environment and policy and explained the importance of parents as essential person for their infant while in hospitalization. In each session, the researcher invited fathers to participate in this study alongside mothers, then informed fathers about preterm infant care and invited them to interact with their infants. Furthermore, the researcher informed mothers and fathers about medical equipment for preterm infants. The researcher guided the goal setting for the parents based on the reality of the parents' participation in preterm infant developmental care. The parents were encouraged to express their feelings about the situation of their preterm infant. The expression of feelings assisted the parents in understanding their feelings, participation in preterm infant care, preterm infant cues and their response to their preterm infant, and their infant problems in this situation. Furthermore, the researchers listened deeply with sympathy and respect for the belief and ability of the parents. After that, the researchers discussed the obstacles when participating in caring for preterm infants during NICU hospitalization. The researchers encouraged the parents to identify and assess their individual needs for involvement in their preterm infant's care during hospitalization. Then, the researchers worked collaboratively with the NICU nurses to organize activities to promote infant development.

Session 2: Day 3 (90 minutes). The intervention focused on coaching the parents to develop their self-efficacy in preterm infant care, promoting and supporting therapeutic infant development, providing the parents psychosocial support, and reflecting and evaluating (stages 3-6). The researchers provided education training including the healing environment and optimizing nutrition as follows: 1) breast pumping, 2) breastfeeding, 3) effect of mother milk odor, 4) mouth care with mother

milk, 5) a parent soft touch such as kangaroo care, and 6) mother voice. The researchers provided the handbook and preterm infant development daily plans to guide the participants in their preterm infant care. Then, the researcher provided the parents with practice on these topics. The parents practiced training tactics including demonstration and return demonstration strategies. Each practice was performed on one-by-one coaching between the researcher and participant in a private room and/or at bedside care. The researchers guided the goal setting for the parents based on the reality of parent participation in preterm infant developmental care. The researcher also planned and set the time for the parents to care for their preterm infant and reduce the parents' stress. Lastly, the parents were asked to reflect and evaluate the activities of this session and then the researchers gave them comments, and suggestions, and thanked them for their participation in the program.

Session 3: Day 5 (90 minutes). The intervention focuses on coaching the parents to develop their self-efficacy in preterm infant care, promoting and supporting therapeutic infant development, providing the parents psychosocial support, and reflecting and evaluating (stages 3-6). The researchers provided educational training including safeguarding sleep, positioning, and handling comprised of 1) preterm infant's sleep stage, and 2) position of preterm infant and handling. Then, the researchers provided the parents with practice on these topics. The parents practiced training tactics including demonstration and return demonstration strategies. Each practice was performed on one-by-one coaching between the researcher and participant in a private room and/or at bedside care. The researcher also planned and set the time for the parents to care for their preterm infant and reduce the parents' stress. Lastly, the parents were asked to reflect and evaluate the activities of this session and then the researchers gave them comments, and suggestions, and thanked them for their participation in the program.

Session 4: On day 7 (90 minutes). The intervention focused on coaching the parents to develop their self-efficacy in preterm infant care, promoting and supporting therapeutic infant development, providing the parents psychosocial support, and reflecting and evaluating (stages 3-6). The researcher provided educational training including minimizing stress and pain, and protecting the skin comprised of 1) how to release stress and pain for the preterm infant, 2) how to read

infant's behavioral cues related to stress and pain, and 3) how to provide comfort such as facilitated tucking, and how to protect their skin. Then, the researchers provided the parents with practice on these topics. The parent practiced training tactics including demonstration and return demonstration strategies. Each practice was performed on one-by-one coaching between the researcher and participant in a private room and/or at bedside care. The researcher also planned and set the time for the parents to care for their preterm infant and reduce the parents' stress. Lastly, the parents were asked to reflect and evaluate the activities of this session and then the researchers gave them comments, and suggestions, and thanked them for their participation in the program.

Evaluation stage

After the completion of the intervention, the data collection was conducted as described below.

1. In the post-intervention evaluation, the research assistant B assessed parental self-efficacy using the perceived maternal parenting self-efficacy (PMP S-E), preterm body weight, head circumference, length, and neonatal neurobehavioral development using the Neonatal Neurobehavioral Examination (NNE) in both the control and experimental groups at week 2 (day 14).
2. In the follow–up evaluation, the research assistant B assessed parental self-efficacy using the Perceived Maternal Parenting Self-Efficacy (PMP S-E), preterm body weight, head circumference, length, and neonatal neurobehavioral development data using the Neonatal Neurobehavioral Examination (NNE) in both the control and experimental groups at week 4 (day 28).

A summary of the recruitment and data collection plan is shown in figure 2.

Table 1 Activities of Comprehensive Preterm Infant Developmental Care Program

Principles	Activities	Times
Stage 1: Creating a trusting relationship and goal setting **Aim:** - Establishing a relationship between the researcher and parents - Setting goals about preterm infant developmental care	1. Introducing the researcher to the parents. 2. Describing objectives and outlines of the program. 3. Providing information to the parents about NICU environment and policy. 4. Providing information about preterm infant care for father alongside mothers and inviting fathers to interact with their infants. 5. Providing information about medical equipment for preterm infants to mothers and fathers. 6. Explaining the importance of parents as an important person for their infant while in hospitalization. 7. Setting a goal based on reality about parent participation in the preterm infant developmental care. 8. Encouraging the parents to set up a group of care for their preterm infants via line application to share their experiences. 9. Praising the parents visiting or competing.	15 minutes

Table 1 (Continued)

Principles	Activities	Times
Stage 2: Understanding context of the parents and preterm infants **Aim:** To understand the parent expectation and need, and reading preterm infant cue	1. Encouraging the parents to express their feeling about the situation of their preterm infants 2. Helping the parent to understand their feeling, participation in the preterm infant care, preterm infant cues, and their response to their preterm infant, and their infant problems in this situation. 3. Discussing the obstacles to participation in caring for the preterm infant during NICU hospitalization. 4. Encouraging the parents to identify and assess their individual need for the involvement in their preterm infant care during hospitalization.	35 minutes
Stage 3: Coaching the parents to enhance parents' confidence in preterm infant care **Aim:** To enhance parent knowledge and parent self-efficacy in preterm infant care	1. Providing educational training including optimizing nutrition, healing environment, safeguarding sleep, positioning, and handling, minimizing stress and pain, and protecting skin. 2. The researcher will conduct a demonstration in six topics. 3. The parents will perform the return demonstrations in six topics.	60 minutes

Table 1 (Continued)

Principles	Activities	Times
Stage 4: Promoting and supporting therapeutic infant development **Aim:** To enhance neurobehavioral development of preterm infant	1. Promoting therapeutic infant development care by collaborating with NICU nurses to organize activities to promote infant development including optimizing nutrition, healing environment, safeguarding sleep, positioning and handling, minimizing stress and pain, and protecting skin 2. Encouraging the parents to visit and participate in their preterm infant care while hospitalization	10 minutes
Stage 5: Providing the parents psychosocial support **Aim:** To support parent participate in their preterm infant care	1. Planning and set the time for the parents in providing care for their infant and reducing parent stress. 2. Facilitating and encouraging the parent to involve their infant care.	10 minutes
Stage 6: Reflecting and evaluating **Aim:** To reflect and evaluate the program.	1. The researcher will invite the parents to reflect on the activities of the program. 2. The researcher will give the commendation and thank to them for participating in the program.	10 minutes

Data analyses

The data was analyzed based on the type of data and the objectives of the study. The details of the data analysis were summarized as follows:

1. Qualitative data were analyzed by analytic procedures of Marshall and Rossman (2006). The analytic procedures fall into seven phases that consist of a) organization the data, b) immersion in the data, c) generating categories and themes,

d) coding the data, e) offering interpretations through analytic memos, f) searching for alternative understandings, and g) writing the report or other format for presenting the study.

2. A statistical software program was used to analyze quantitative data, and the statistical significance level was set at .05.

2.1 Descriptive statistics, including frequency, percentage, mean, and standard deviation, were used to analyze and describe the demographic characteristics of the parents and preterm infants.

2.2 Chi-square, Fisher's exact tests, and an independent *t*-test were used to evaluate the differences between the experimental and the control groups.

2.3 An independent *t*-test was performed to evaluate the experimental and control groups on weight gain velocity and growth velocity on the 14^{th} day from birth (T1), the 28^{th} day from day 14 (T2), and the 28^{th} day from birth (T3).

2.4 Two-Way Repeated Measures ANOVA (one-between and one-within) was employed to test the differences in scores of parental self-efficacy, preterm infant growth (weight gain, length gain, and head circumference gain), and neurobehavioral development of the preterm infant between the experimental and control groups at pre-intervention (T1), post-intervention (T2), and follow-up (T3). Additionally, Bonferroni-corrected pairwise *t*-tests were employed to test for changes over time within the experimental group in mean scores in parental self-efficacy, preterm infant growth (weight gain, length gain, and head circumference gain), and the neurobehavioral development of the preterm infant at pre-intervention (T1), post-intervention (T2), and follow-up (T3). Prior to data analysis, four assumptions of the repeated measure of ANOVA were tested, which consisted of 1) normality of the variables was tested using Shapiro-Wilk's test ($p > .05$), visual inspection of the participant's histogram, normal Q-Q plots, and box plots. Fisher's measure of skewness was calculated by dividing the skewness value by the standard error of skewness; 2) outliers of the variables consisted of the univariate outliers of variables were tested by Box-plot, and the multivariate outliers of variables were tested by using Mahalanobis distance with chi-square; 3) Mauchly's test was used to test sphericity for equality of variance for the within-subjects effect; and 4) Levene's test was used to test homogeneity of variance for the between-subjects design.

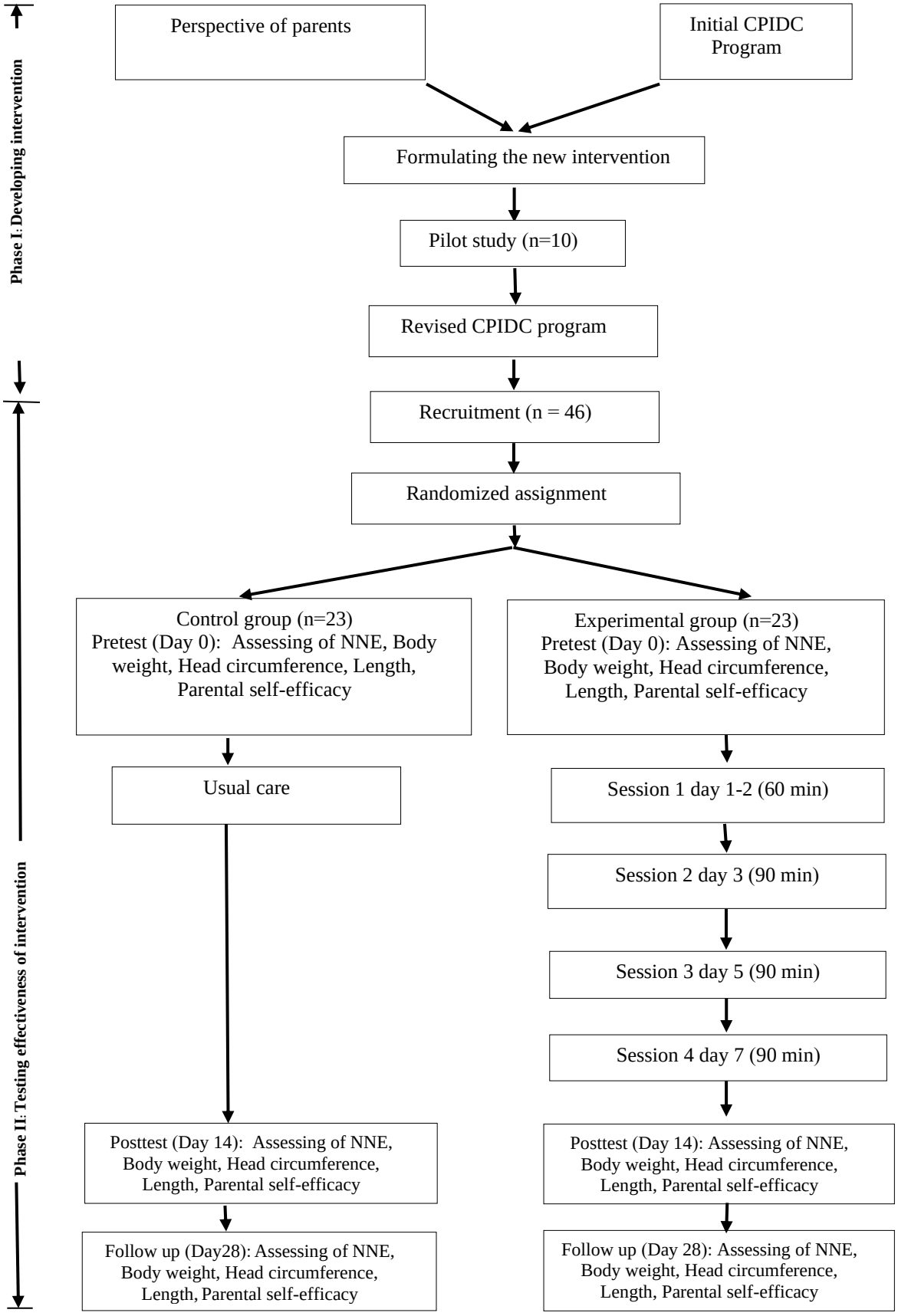

Figure 2 Recruitment and data collection plan

CHAPTER 4
RESULTS

This chapter presents the research findings concerning the development of a comprehensive preterm infant developmental care (CPIDC) program for parents and preterm infants in Chonburi Province, Thailand. The research results include two parts: the development of the CPIDC program and the verification of the CPIDC program on preterm infant growth, preterm infant neurobehavioral development, and parental self-efficacy.

Part 1: Development of CPIDC program

The results of this section are presented in three parts: 1) perspectives of parents towards participation in preterm infant developmental care, 2) formulating the new intervention, and 3) pilot study for revising and testing effectiveness of CPIDC program.

1. Perspectives of parents towards participation in preterm infant developmental care

This part focused on understanding the current situation of the preterm infant developmental care during NICU hospitalization from ten parents having preterm infants treated in NICU. Researcher conducted in-depth interviews with 5 mothers and 5 fathers. The age of parents was 23-39 years and the mean age was 30 ± 5.54 years. The majority were married (90%), employed by private companies (80%), less than bachelor's degree (90%), and income lower than 30,000 bath per month (90%). Half of them were nuclear family and the other half were extended family. The majority of parents were planned for pregnancy (80%) and antenatal care (90%). Half of them were normal labor and the other half cesarean section, with 30% having first infant and grandmother support (60%). All of parents were non-experience of having preterm infant. The gestational age of preterm infants was 28-32 weeks by Ballard score, with mean of 30.6 ± 1.35 weeks. All of the infants had Clinical Risk Index for Babies (CRIB) scores less than 10. More than half of preterm infants were boys (60%). The body weight was 830-1660 grams, with mean of 1356.5 ± 224.883 grams. At birth, all infants were appropriate for gestational age

(AGA) according to the classification of infant size by gestational age. All of preterm infants were diagnosed with respiratory distress syndrome (RDS).

The results of this part are described as follows:

The overarching theme expressed in the overall temporal meaning of parental participation in the developmental care of preterm infants during hospitalization was “Collaborative participation as a key to success for promote parental participation in developmental care of preterm infants during NICU hospitalization”. This overarching theme had been generated from the 3 themes that consist of 1) parental factors, 2) health care service factors, and 3) family factors.

1) Parental factors: These related to preterm infant developmental care had been generated in 5 categories including 1) barriers of parental participation, 2) parental instinct to make participation, 3) feelings of parents toward their preterm infants, 4) lack of confidence, and 5) parent desire.

Barriers of parental participation: Parents needed to have close attention for caring of their infant and concerned with health problem of their infant and miss them during the separation time because their babies in NICU. Mothers who had cesarean section with health condition had a limited activity and waited for health recovery, visiting time limited for work, house was far from hospital, and fear the NICU environment, some parents address that:

“The NICU environment made me cry because there are many medical equipment that I fear. It made my heart trembling with fear.” (36 years old father)

“My house is far from the hospital. If my husband is busy, I can’t come to visit my baby because I can’t drive a car. In addition, I would like to be stronger because I had a caesarean section, then I could take the bus to the hospital by myself.” (31 years old mother)

“While my baby was kept in the incubator, I didn’t dare to ask the nurse about how I could touch my baby or not. I’m afraid that I will disturb the working time of the nurses. I never had a sick baby, so I don’t know how to do for him.” (34 years old mother)

“I have limited time because I must work every day.” (39 years old father)

"I asked for a wheelchair to visit my baby as soon as I recovered after my caesarean section, but the nurse don't allow me because it was the first day of cesarean section…..I waited until I returned to home" (31 years old mother)

Parental instinct to make participation: Parents thought that father and mother's instinct made them a confidence to participate in their infant care, that let them try everything to do for their infant. Moreover, they felt their infant need support from them, some parents address that:

"I think my love and bonding gives me confidence that I can take care of my baby." (23 years old mother)

"I thought it was my mother's instinct that gave me the confidence that I could take care of my baby… I tried everything to get more breast milk for my baby." (31 years old mother)

"I think the self-confidence comes from being a father. Therefore, I have to pay attention to every detail of my baby." (31 years old father)

"I believed in myself that I can look after him. I've had experience with raising my child." (23 years old mother)

"I think it's probably from the experience of raising the oldest child. Because I raised all my children by myself, it probably came from my father's instinct." (25 years old father)

Feelings of parents toward their preterm infants: Parents felt fear, shocked, worried, guilty, suffering because preterm infants had many types of medical equipment on the body, small size, less responsiveness, all of infant keep in incubator, and their condition change every hour. In addition, parents felt sad, worried, guilty, and afraid when they knew their babies were preterm infants and treated in NICU that made them unexpected to participate in their infant care, some parents address that:

"I can't accept it because it not my expected. She's very small. I can't make up my mind, will she survive? What will happen next to her? Even if her weighs more, will she be strong? I think everything could happen because she was born prematurely, right? (28 years old mother)

"I was suffering from his condition. Why was his condition so

serious? He was a small baby, why he needs many medical equipment? (31 years old mother)

"I worried about my baby and fear that he will get hurt when he gets a blood drawn by a nurse or doctor and undergoes various procedures. In addition, I was worried about the infection because he was born prematurely." (31 year old father)

"I feel bad to see my baby on a ventilator. I think he must be tired. I feel pity for him. If it's possible, I'd like to be a substitute for him." (34 year old mother)

"His symptoms had to use a ventilator, I felt very uncomfortable. I was worried that he was hurt and got dangerous from ventilator…. He had to be intubated and I felt pain for him." (25 years old father)

"Since my baby was born, I never had a chance to hold him. I need to hold him in my chest once, but I wanted him to get well soon." (31 years old father)

Lack of confidence: Parents understood that the preterm infant in NICU can't be touch, hold, and could not participate in their infant care. Parents felt low confidence to look after their infant because their babies were preterm infant and treated in NICU. Moreover, they thought their infant more get risks from they participated, that inhibited them to participate in their infant care, some parents address that:

"I don't have any confidence in caring for this baby, even though I've had experience raising two children, I can not apply to this baby because she was born prematurely." (28 years old mother)

"I could only stand outside watching my baby and listen to the nurse or doctor about his condition." (34 years old mother)

"It didn't know what I can do for my baby while she is in NICU." (39 years old father)

"I understood that my baby was safe in the incubator, and I can not hold or hug him." (31 years old father)

"It's very risky for me to get involved in my baby care, because the visiting her like this, I might be able to bring germs to her." (28 years old mother)

Parent desire: Parents preferred to participate in their preterm infant developmental care as much as they can. Parents need to be close with their baby

and required to participate in their baby care as much as they can if the medical staffs allow, and some parents address that:

"I want to take care of my baby in everything to make him better and be safe as much as possible. I want to hug and hold him by myself. I wish I could feed him and let me send him to sleep by myself." (23 years old mother)

"In my baby's difficult time, I realize that my baby really need many kinds of support so I want to touch my baby, just would like him to know that I am here." (31 years old mother)

"I wish the hospital would have a special room that I could feed and look after my baby there privately and I could spend much time with my baby." (31 years old mother)

"I would like to take care my baby more, but I could not. Anyway, I am relieved because my baby has been looked after by a good team of nurses and doctors. However, I would like to participate in caring of my baby more if the medical staffs let me in." (31 years old father)

2) Health care service factors: These had been generated into 2 categories consisted of 1) appreciate and trust in medical health service and health care provider, and 2) parent need support from nurse in terms consulting, coaching, and training to participate in their preterm infant developmental care.

Appreciate and trust in medical health service and health care provider: Parents believed health care providers are experts in preterm infant care with medical technology. Parent also appreciated that nurses provide humanized care for their hearts. There is a good visiting policy. These could promote parents to participation in their infant care. On the other hand, it could inhibit parents to participation in their infant care because parents might feel that nurses already provide the best care for their infants, parents shouldn't involve. Therefore, it should be concerned about this part before promote parent to participation in their infant care, some parents address that:

"The NICU2 staffs are very nice, they are very good-natured and give us a clear answer when we ask, what medicine did our baby take today and how much oxygen did our baby receive? They gave us all the details about our baby." (31 years old father)

"I could see how the nurses at NICU looked after my child with all of their hearts. Despite it was just their duties to look after my baby in their shift, they could just keep working in their shift and stop when the shift is over. Wonderfully, my baby got better and stayed away from threatening conditions because of their helps." (28 years old of mother)

"I could see that the other babies in the NICU had been looked after by the nurse staff intensively and delicately, so I relied on their services and I truly believed that they were going to look after my child very well." (31 years old father)

"I could see that the other babies in the NICU had been looked after by the nurse staffs intensively and delicately, so I relied on their services and I truly believed that they were going to look after my child very well." (31 years old father)

"I believe that my baby will be safe in here, because I can see so many advanced medical instruments and lots of technologies in the NICU." (26 years old father)

"I see the nurses and doctors are looking after the babies in the NICU every one hour. So, I am not worried about my child and my child is getting better now." (34 years old mother)

"I am impressed so much that despite this hospital is just a charity government hospital, but it has many high technology medical instruments even more than luxurious private hospitals. Moreover, the medical staff has accepted my baby to be treated in this hospital despite the other private hospital refused my baby because my baby condition severity. Their medical staffs have been taking care my child very well, even though my baby is very small" (28 years old mother)

Parent need support from nurse: Nurses should provide consulting, coaching, and training to participate in their preterm infant developmental care. Parents required information from nurses about preterm infant care during hospitalization. They need to participation in their infants developmental care under supervision from healthcare provider such as how to touch while the infants on ventilator, feeding, bathing, hold, and everything that nurse allowed them to do with

their infants. Moreover, parents want to learn how to take care of their baby together, some parents address that:

"I wish I could open the incubator door correctly so that I will not damage the incubator and I can look after my baby in the incubator by inserting my hands into the incubator correctly. I really need someone or a nurse staff to teach me about using the incubator and some medical devices basically." (34 years old mother)

"I need someone to give me an advice on taking care a premature baby, including telephone counseling when my baby discharged back home." (28 years old mother)

"If my baby condition is getting better, I will have much more willing to learn techniques and knowledges in baby care from nurse staffs. If nurse staffs teach me about baby care techniques and let me try to practice under their supervision, I will have more confidence." (39 years old father)

"I would like a nurse to teach me and my wife both about taking care of our baby so that I can help my wife to look after our baby." (36 years old father)

3) Family factor: It had been generated in one category, which family support enhancing parent to participation in preterm infant developmental care.

Family support: Family support is enhancing parent to participation in preterm infant developmental care. Mothers felt relieved about their infant condition when their husband had psychosocial support, took care for mothers in daily life, and helped for carrying breast milk to their infant. Moreover, fathers learned about infant care from their wife to support in taking care their baby. In addition, most of grandmothers will support and plan to help the mothers to take care their infants at home that would increase self-efficacy of mothers to participation in their preterm infant developmental care, some parents address that:

"I so happy when I see my baby having only an oxygen mask. A week ago my husband said that our baby had many ventilation tubes and a lot of medical wires, however my husband was keeping telling me that they are helping our baby, please rely on them, they are making our baby better." (31 years old mother)

"I can always look after my baby because my husband has asked

me to quit my job in order to spend more time with my baby. Whatever my baby's condition is, getting better or getting worse, I can spend all of my time with him. Hopefully my baby's condition will be much improved soon so that I can go back to work." (34 years old mother)

"My husband helped bringing the breast milk to the hospital for our baby". (23 years old mother)

"I learned to take care of baby from my wife because she was taught by doctors and nurses. So, when our baby come home, I can help her to take care of our baby." (36 years old father)

"Grandmother will help me to take care of my baby which gives me the confidence to take care of my baby." (31 years old mother)

From the perspective of fathers and mothers about parental participation in the developmental care of preterm infant during NICU hospitalization that presented they needed to close interaction with their infant. However, parent have less confidence to participate in developmental care for preterm infants. They needed supported from nurses to help them understand their infant's behaviors, and promote preterm infant development care such as touch, hold, feeding, skin to skin, even though their infants in NICU.

2. Formulating the new intervention

The CPIDC program was developed based on the integration of theoretical knowledge, research evidences, and perspective of parents who had preterm infants treated in neonatal intensive care units.

The development of the CPIDC program from scientific of theory and research evidence was presented in six stages divided into four sessions, which included: 1) creating a trusting relationship and goal setting, 2) understanding context of the parents and preterm infants, 3) coaching the parents to develop their self-efficacy in preterm infant care, 4) promoting and supporting of therapeutic infant development, 5) providing the parents psychosocial support and 6) reflecting and evaluating. This program's intervention was conducted in 4 sessions, which covered 6 stages within one week. The program started on day 1 or day 2; subsequent days were 3, 5, and 7. Then, the researcher formulated the new intervention by integrating the perspectives of parents who had preterm infants

treated in neonatal intensive care units. As a result, the CPIDC program consisted of 6 stages in 4 sessions, all of which were conducted within one week, as with theory and evidence. According to the results from the parents' perspective, the researcher added more activities in this program, such as fathers expressing a need for preterm infant care information alongside mothers. Therefore, in each session, the researcher invited fathers to participate in this study alongside mothers, then informed fathers about preterm infant care and invited them to interact with their infants. Furthermore, the researcher informed mothers and fathers about medical equipment for preterm infants. The details of the integration of parents' perspectives into the CPIDC program are shown in Table 2.

Table 2 The integration of parents' perspectives in the CPIDC program

Perspective of parents	**Activities**
1. Parent need information about medical equipment.	1. Providing information about medical equipment for preterm infants to mothers and fathers (stage 1).
2. Father need information about preterm infant care.	2. Providing information about preterm infant care for father and inviting fathers to interact with their infants (stage 1,4).
3. Parents appreciate and trust in medical service and health care provider.	3. Explaining the significance of parents interacting with health care providers while visiting their infants in order to encourage and promote parents to participate in their infant's care. (It was the same activity in which the theory and evidence were presented in stage 1, 4).
	4. Explaining the importance of parents as an important person for their infant while in hospitalization (It was the same activity in which the theory and evidence

Table 2 (Continued)

Perspective of parents	Activities
	were presented in stage 1).
4. Parent fear, worry, sad, pity, suffering about their preterm infant during NICU hospitalization.	5. Encouraging the parents to express their feeling about the situation of their preterm infants (It was the same activity in which the theory and evidence were presented in stage 1, 2). 6. Helping the parent to understand their feeling, participation in preterm infant care, preterm infant cues and their response to their preterm infant, and their infant problems in this situation (It was the same activity in which the theory and evidence were presented in stage 1, 2).
5. Barriers of parental participation in preterm infant developmental care.	7. Discussing the obstacles of participation in caring for preterm infant during NICU hospitalization (It was the same activity in which the theory and evidence were presented in stage 2). 8. Encouraging the parents to identify and assess their individual need for the involvement in their preterm infant care during hospitalization (It was the same activity in which the theory and evidence were presented in stage 2).
6. Parent need support from nurse	9. Facilitating and encouraging the parent to involve their infant care (It was the same activity in which the theory and evidence were presented in stage 5).

Table 2 (Continued)

Perspective of parents	Activities
	10. Consulting, coaching, and training parent to participate in their preterm infant developmental care (It was the same activity in which the theory and evidence were presented in stage 3,4,5)

3. Pilot study the CPIDC program

Qualitative and quantitative data were used for revising the CPIDC program and tested for feasibility (Thabane et al., 2010). In this step, 10 parent-preterm infant dyads in Chonburi hospital were asked to participate after the study approved from the Institutional Review Board committee, Burapha University, and Chon Buri Hospital. The participants who met the inclusion criteria were recruited for enrolling and receiving the CPIDC program. Then, the participants were asked to reflect related to participation in the CPIDC program

Feasibility of the program was determined by all of participants, and the problem of implementation of the program. The results showed the length of stay of preterm infant in NICU was 5-38 days and the duration time of admitted in hospital was 32-68 days. Therefore, the period of time of CPIDC program that the researcher developed based on the integration of related theoretical and scientific knowledge, research evidence, and perspectives from parents is proper.

Acceptability of the program was determined by participants' ratings on the CPIDC program evaluation questionnaire and by participants' comments. All of participant accepted and satisfied the CPIDC program in Table 3.

Table 3 Acceptability rating scores of the CPIDC program (n = 10)

Variables	Agree		Disagree	
	n	**%**	***n***	**%**
1. CPIDC program help me to increase self-efficacy in caring my baby	10	100	0	0
2. CPIDC program help me to increase knowledge about promoting the growth of my baby	10	100	0	0
3. CPIDC program help me to increase knowledge about promoting the neurobehavioral development of my baby	10	100	0	0
4. CPIDC program help me to increase skill to promoting the growth of my baby	10	100	0	0
5. CPIDC program help me to increase skill to promoting the neurobehavioral development of my baby	10	100	0	0
6. It is easy to read and understand language in handbook	10	100	0	0
7. It is easy to use daily plan	10	100	0	0
8. Time period of CPIDC program is appropriate	10	100	0	0
9. I'm satisfied with CPIDC program	10	100	0	0

Part 2: Verification the CPIDC program on preterm infant growth, preterm infant neurobehavioral development, and parental self-efficacy

This section's findings are presented in five parts: 1) The CONSORT flow diagram, 2) characteristics of participants in the experimental and control groups, 3) descriptive statistics of preterm infant growth, preterm infant neurobehavioral development, and parental self-efficacy between the experimental and control

group, 4) comparisons of preterm infant growth, preterm infant neurobehavioral development, and parental self-efficacy between experimental and control groups and 5) examine the effectiveness of the CPIDC program on preterm infant growth and neurobehavioral development, and parental self-efficacy.

1. The CONSORT flow diagram

The 46 parent-preterm infant dyads in this study were assessed for eligibility criteria and invited to participate in the research project. They were all willing to participate in the research project and had not declined to participate. Forty-six participants were randomly assigned to the experimental group (23 cases) and the control group (23 cases). The CPIDC program was given to the experimental group. There was no drop-out rate among the experimental group participants during the post-intervention and follow-up period. While the control group received the usual care. There was no drop-out rate among the participants in the control group during the post-intervention and follow-up period too. As a consequence, the results were analyzed on an experimental group of 23 participants and a control group of 23 participants, as shown in Figure 3.

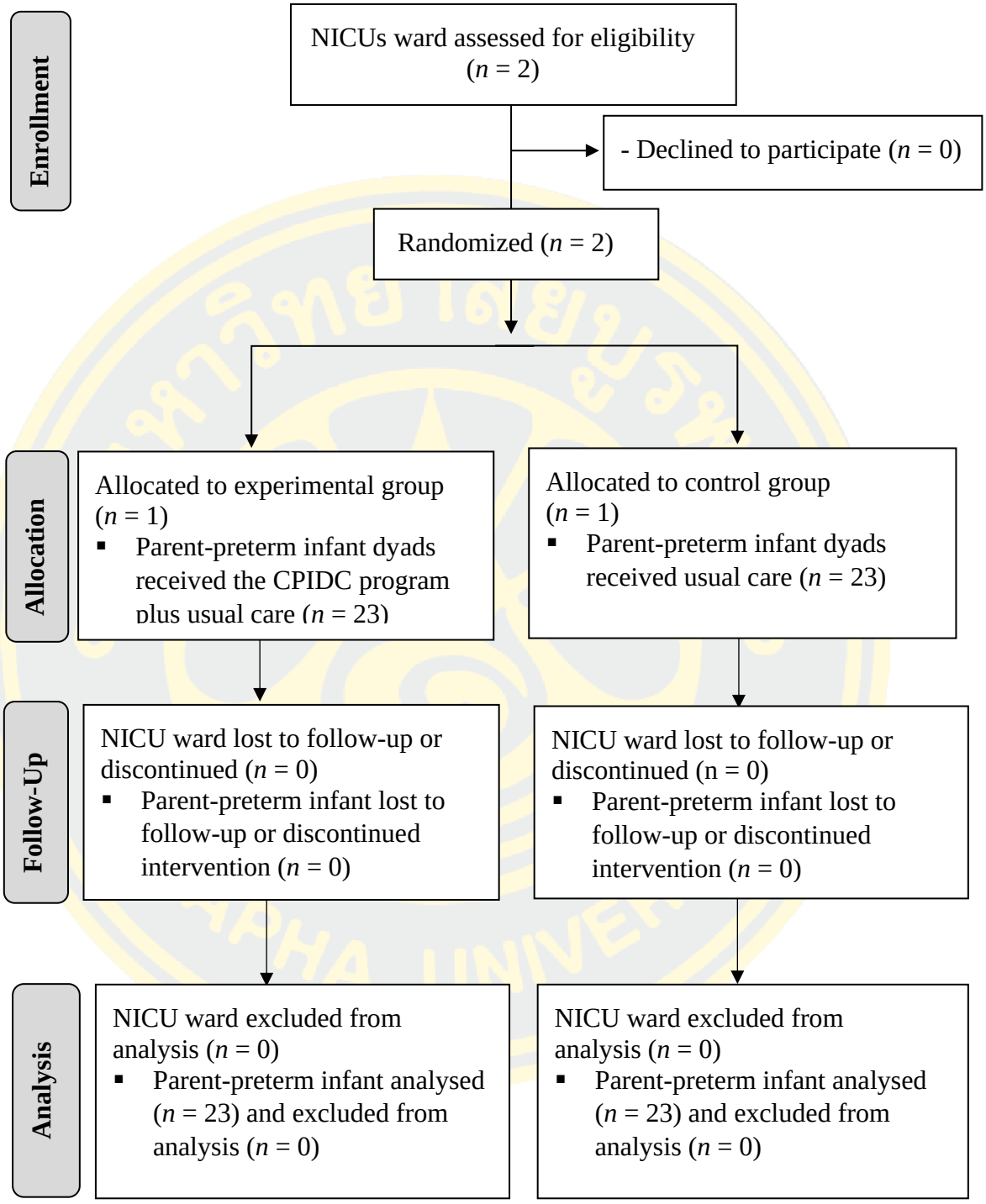

Figure 3 The CONSORT flow diagram of the progress through the phases of a parallel randomized trial of two groups

2. Characteristics of participants in the experimental and control groups

This study had 46 eligible parent-preterm infant dyads. All of them were invited to participate and sign the inform consents. In this research data collection process, no dropped out participants were found. Therefore, the participants of this study were randomly assigned into the experimental group (23 parent-preterm infant dyads) and the control group (23 parent-preterm infant dyads).

2.1 Parent characteristics

In experimental group, the relationship of all participants with the infant was the mother of the infant. There were 23 mothers with their mean age of 32.22 years old (SD = 7.19), 69.57% had below bachelor's degree education, almost of them were employee or worker during the time of pregnancy (91.30%), and 47.83% had family income ≤ 20,000 baht/ months. More than one half of families were nuclear families (56.52%) background. About 56.52% of mothers were single in marital status. Most of mothers planned to get pregnant (69.57 %), all of them had antenatal care (100%), and 65.22% had on complication during pregnancy. About 56.22% of mothers were not first order of infant, but all of them had no experience of having preterm infant (100%). Most of them gave delivery by cesarean section (60.87%). The grandmothers supported to care preterm infants at home (43.48%). The range of separation time between mother and preterm infant was 2-5 days with mean 3.33 (*SD* = 1.06) days.

In the control group, the relationship of all participants with the infant was the mother of the infant. There were 23 mothers with their mean age of 28.78 years old (SD = 6.24), 78.26% had below bachelor's degree education, almost of them were employee or worker during the time of pregnancy (82.61%), and 43.48% had family income 20,001-30,000 baht/ months. More than one half of families were nuclear families (56.52%) background. About 60.87% of mothers were married in marital status. Most of mothers planned to get pregnant (65.22%), almost of them had antenatal care (91.30%), and 60.87% had on complication during pregnancy. About 60.87% of mothers were first order of infant, but all of them had no experience of having preterm infant (100%). Most of them gave delivery by normal labor (52.17%). The grandmothers supported to care preterm

infants at home (56.52%). The range of separation time between mother and preterm infant was 2-6 days with mean 3.78 (*SD* = 0.90) days.

Parent characteristics between the experimental and the control groups were compared by using chi-square test and Fisher's exact test for categorical data, and *t*-test for continuous data to determine their differences. There were no statistically significant differences of parent characteristics between experimental and control groups ($p > .05$) which the details were shown in the Table 4.

Table 4 The demographic characteristics of parents in experimental and control groups

Characteristics	**Experimental group (*n*=23)**		**Control group (*n*=23)**		**Statistic value**	***p*-value**
	n	**%**	***n***	**%**		
Age (year)					1.730	.091[a]
Range	18 - 46		18 - 42			
$\bar{X} \pm SD$	32.22 ± 7.19		28.78 ±6.24			
Education					0.451	.502[b]
< Bachelor's degree	16	69.57	18	78.26		
≥ Bachelor's degree	7	30.43	5	21.74		
Occupation					0.767	.665[b]
Employee	21	91.30	19	82.61		
Unemployed	2	8.70	4	17.39		
Family income (Baht/month)					1.003	.606[b]
≤ 20,000	11	47.83	8	34.78		
20,001 - 30,000	7	30.43	10	43.48		
≥ 30,001	5	21.74	5	21.74		

Note [a] =Independent t-test, [b] =Chi-square test, [c]= Fisher's Exact test

Table 4 (Continued)

Characteristics	Experimental group (*n*=23)		Control group (*n*=23)		Statistic value	*p*-value
	n	%	*n*	%		
Type of family					0.000	1.000[b]
Nuclear family	13	56.52	13	56.52		
Extended family	10	43.48	10	43.48		
Marital status					1.394	.238[b]
Married	10	43.48	14	60.87		
Single	13	56.52	9	39.13		
Plan to pregnancy					0.099	.753[b]
Planned	16	69.57	15	65.22		
Unplanned	7	30.43	8	34.78		
Antenatal care						.489[c]
No	0	0	2	8.70		
Yes	23	100	21	91.30		
Complication during pregnancy					0.093	.760[b]
No	15	65.22	14	60.87		
Yes	8	34.78	9	39.13		
Number of children					1.394	.238[b]
1	10	43.48	14	60.87		
≥ 2	13	56.52	9	39.13		
Type of delivery					0.789	.375[b]
Normal labor	9	39.13	12	52.17		
Cesarean section	14	60.87	11	47.83		

Note [a] =Independent t-test, [b] =Chi-square test, [c]= Fisher's Exact test

Table 4 (Continued)

Characteristics	Experimental group (*n*=23)		Control group (*n*=23)		Statistic value	*p*-value
	n	%	*n*	%		
Significant person helping to care infant					0.783	.376[b]
Husband	13	56.52	10	43.48		
Grandmother	10	43.48	13	56.52		
Separation time (day)					-1.571	.123[a]
Range	2-5		2-6			
$\bar{X} \pm SD$	3.33 ± 1.06		3.78 ±.90			

Note [a] =Independent t-test, [b] =Chi-square test, [c]= Fisher's Exact test

2.2 Preterm infant characteristics

In experimental group, there were 23 preterm infants with girl majority (56.52%). Most of them had CRIB score of 0 – 5 (65.23%). The mean of preterm infant gestational ages were 30.83 weeks (*SD* = 1.34), and the most of gestational age were 32 weeks (43.48%). More than one half of infants (56.52%) were very preterm infants (< 32 weeks). The mean of body weight at birth 1472.83 grams (*SD* = 431.15), and 47.83% of infant were low birth weight (< 2500 grams). At birth, 82.61% of infants were appropriate for gestational age (AGA). The mean of length at birth were 39.67 centimeters (*SD* = 4.15) and mean of head circumference at birth were 27.30 centimeters (*SD* = 2.49). About 60.87% of the infants had an Apgar score of 7-10 in the first minute. In the fifth minute, most of infants had an Apgar score of 7-10 (78.26%). In the tenth minute, all of infants had an Apgar score of 7-10 (100%). All of preterm infants were diagnosed with respiratory distress syndrome (100%) and hyperbilirubinemia (100%), apnea of prematurity (30.43%), feeding intolerance (34.78%), patent ductus arteriosus (47.83%), anemia (30.43%), and no intraventricular hemorrhage. All of preterm infants (100%) were provided total parenteral nutrition (TPN), lipid, and breast milk. Length of stay in hospital of

preterm infants was 41.43 days (*SD* = 13.45). In addition, the length of stay in NICU was 12.35 days (SD = 11.58).

In the control group, there were 23 preterm infants with boy majority (69.57%). Most of them had CRIB score of 6 – 10 (56.52%). The mean of preterm infant gestational ages were 30.65 weeks (*SD* = 1.30), and most of the gestational age (30.43%) were 31 weeks and 32 weeks. About 73.91% were very preterm infants (< 32 weeks). The mean of body weight at birth 1372.17 grams (*SD* = 312.15), and 56.52% of infant were very low birth weight (< 1500 grams). At birth, 95.65% of infants were appropriate for gestational age (AGA). The mean of length at birth were 39.24 centimeters (*SD* = 3.55) and mean of head circumference at birth were 27.30 centimeters (*SD* = 2.88). About 52.17% of the infants had an Apgar score of 7-10 in the first minute. In the fifth minute, almost of infants had an Apgar score of 7-10 (86.96%). In the tenth minute, all of infants had an Apgar score of 7-10 (100%). All of preterm infants were diagnosed with respiratory distress syndrome (100%) and hyperbilirubinemia (100%), apnea of prematurity (30.43%), feeding intolerance (30.43%), patent ductus arteriosus (52.17%), anemia (30.43%), and intraventricular hemorrhage (8.70%). All of preterm infants (100%) were provided total parenteral nutrition (TPN), lipid, and breast milk. Length of stay in hospital of preterm infants was 43.35 days (*SD* = 14.42). In addition, the length of stay in NICU was 14.17 days (*SD* = 10.30).

Preterm infant characteristics between the experimental and the control groups were compared by using chi-square test and Fisher's exact test for categorical data, and *t*-test for continuous data to determine their differences. There were no statistically significant differences of preterm infant characteristics between experimental and control groups ($p > .05$) which the details were shown in the Table 5.

Table 5 The demographic characteristics of preterm infant in experimental and control groups

Characteristics	Experimental group (*n*=23)		Control group (*n*=23)		Statistic value	*p*-value
	n	%	*n*	%		
Gender					3.185	.074[b]
Boy	10	43.48	16	69.57		
Girl	13	56.52	7	30.43		
Gestational age					0.459	.648[a]
Range	28-32		28-32			
$\bar{X} \pm SD$	30.83 ± 1.34		30.65 ± 1.30			
28 weeks	2	8.69	1	4.36		
29 weeks	2	8.69	4	17.39		
30 weeks	4	17.39	4	17.39		
31 weeks	5	21.75	7	30.43		
32 weeks	10	43.48	7	30.43		
CRIB score					2.190	.139[b]
0 - 5	15	65.23	10	43.48		
6 - 10	8	34.77	13	56.52		
Range	5 - 9		5 - 9			
Infant's gestational age					1.533	.216[b]
Very preterm (< 32wks)	13	56.52	17	73.91		
Moderate preterm (32 - <34wks)	10	43.48	6	26.09		

Note [a] =Independent t-test, [b] =Chi-square test, [c]= Fisher's Exact test

Table 5 (Continued)

Characteristics	Experimental group (*n*=23)		Control group (*n*=23)		Statistic value	*p*-value
	n	%	*n*	%		
Birth weight (gram)					0.907	.369[a]
Range	680-2260		850-1955			
$\bar{X}$	1472.83		1372.17			
SD	431.15		312.15			
Infant's birth weight					3.189	.203[b]
LBW (< 2500)	11	47.83	7	30.43		
VLBW (< 1500)	7	30.43	13	56.52		
ELBW (< 1000)	5	21.74	3	13.04		
Infant's size						.346[c]
SGA	4	17.39	1	4.35		
AGA	19	82.61	22	95.65		
Length (At birth)					0.381	.705[a]
Range	32-48		34-45			
$\bar{X}$	39.67		39.24			
SD	4.15		3.55			
Head circumference (At birth)					0.000	1.000[a]
Range	23-33.5		23-31			
$\bar{X}$	27.30		27.30			
SD	2.49		2.88			
Apgar score in 1 minutes					0.354	.552[b]
0 - 6	9	39.13	11	47.83		
7 - 10	14	60.87	12	52.17		

Note [a] =Independent t-test, [b] =Chi-square test, [c]= Fisher's Exact test

Table 5 (Continued)

Characteristics	Experimental group (*n*=23)		Control group (*n*=23)		Statistic value	*p*-value
	n	%	*n*	%		
Apgar score in 5 minutes						.699[c]
0 - 6	5	21.74	3	13.04		
7 - 10	18	78.26	20	86.96		
Apgar score in 10 minutes						
7 - 10	23	100	23	100		
Health problem						
RDS	23	100	23	100		
Hyperbilirubinemia	23	100	23	100		
Apnea of prematurity					0.000	1.000[b]
Yes	7	30.43	7	30.43		
No	16	59.57	16	59.57		
Anemia					0.000	1.000[b]
Yes	7	30.43	7	30.43		
No	16	59.57	16	59.57		
IVH						.489[c]
Yes	0	0	2	8.70		
No	23	100	21	91.30		
PDA					0.087	.768[b]
Yes	11	47.83	12	52.17		
No	12	52.17	11	47.83		
Feeding intolerance					0.044	.833[b]
Yes	8	34.78	7	30.43		
No	15	65.22	16	59.57		

Note [a] =Independent t-test, [b] =Chi-square test, [c]= Fisher's Exact test

Table 5 (Continued)

Characteristics	Experimental group (*n*=23)		Control group (*n*=23)		Statistic value	*p*-value
	n	%	*n*	%		
Nutrition type						
TPN, lipid, breast milk, formula milk	23	100	23	100		
Length of stay in NICU					-0.656	.575[a]
Range (day)	3 - 38		2 - 38			
$\bar{X} \pm SD$	12.35 ± 11.58		14.17 ± 10.30			
Length of stay in hospital					-0.465	.644[a]
Range (day)	29 - 68		29 -70			
$\bar{X} \pm SD$	41.43 ± 13.45		43.35 ± 14.42			

Note [a] =Independent t-test, [b] =Chi-square test, [c]= Fisher's Exact test

3. Descriptive statistics of outcome variables

In this study, the outcome variables consisted of preterm infant growth, preterm infant neurobehavioral development, and parental self-efficacy. Means and standard deviations were used to describe these variables.

3.1 Preterm infant growth

In this part described mean scores and standard deviations of growth among preterm infants three-time measured in experimental and control groups. Preterm infant growth consists of weight, length, and head circumference. Moreover, this part showed mean scores and standard deviations of preterm infant weight gain, length gain, and head circumference gain among three-time measured in experimental and control groups.

In the experimental group, mean scores of preterm infant body weight at birth (T1), 14th day (T2), and 28th day (T3) were 1472.83 (*SD* = 431.15), 1584.35 (*SD* = 448.68), and 1945.65 (*SD* = 493.95), respectively. Mean scores of preterm infant length at birth (T1), 14th day (T2), and 28th day (T3) were 39.67 (*SD* = 4.15),

40.76 (*SD* = 4.01), and 41.98 (*SD* = 3.93), respectively. Mean scores of preterm infant head circumference at birth (T1), 14th day (T2), and 28th day (T3) were 27.30 (*SD* = 2.49), 28.17 (*SD* = 2.49), and 29.26 (*SD* = 2.49), respectively. The details are shown in Table 6.

For the control group, mean scores of preterm infant body weight at birth (T1), 14th day (T2), and 28th day (T3) were 1372.17 (*SD* = 312.15), 1473.70 (*SD* = 303.35), and 1765.43 (*SD* = 373.79), respectively. Mean scores of preterm infant length at birth (T1), 14th day (T2), and 28th day (T3) were 39.24 (*SD* = 3.55), 40.02 (*SD* = 3.58), and 41.00 (*SD* = 3.63), respectively. Mean scores of preterm infant head circumference at birth (T1), 14th day (T2), and 28th day (T3) were 27.30 (*SD* = 2.88), 27.93 (*SD* = 2.29), and 28.89 (*SD* = 2.09), respectively. The details are shown in Table 6.

The results showed the preterm infant body weight, length, and head circumference of both groups increased over time, as presented in Table 6.

Table 6 Means and standard deviations of preterm infant growth for both of experimental and control groups

Growth	**Time measured**	**Experimental group (*n*=23)**		**Control group (*n*=23)**	
		$\bar{X}$	***SD***	$\bar{X}$	***SD***
Weight	T1	1472.83	431.15	1372.17	312.15
	T2	1584.35	448.68	1473.70	303.35
	T3	1945.65	493.95	1765.43	373.79
Length	T1	39.67	4.15	39.24	3.55
	T2	40.76	4.01	40.02	3.58
	T3	41.98	3.93	41.00	3.63
Head circumference	T1	27.30	2.49	27.30	2.88
	T2	28.17	2.49	27.93	2.29
	T3	29.26	2.49	28.89	2.18

In the experimental group, mean scores of preterm infant weight gain at the 14th day from birth (T1), at the 28th day from day 14th (T2), and at the 28th day from birth (T3) were 111.52 (*SD* = 98.83), 361.30 (*SD* = 85.46), and 472.83 (*SD* = 143.24), respectively. Mean scores of preterm infant length gain at 14th day from birth (T1), at 28th day from day 14th (T2), and at 28th day from birth (T3) were 1.09 (*SD* = .51), 1.22 (*SD* = 0.52), and 2.30 (*SD* = 0.72), respectively. Mean scores of preterm infant head circumference gain at the 14th day from birth (T1), at the 28th day from day 14th (T2), and at the 28th day from birth (T3) were 0.87 (*SD* = 0.46), 1.09 (*SD* = 0.36), and 1.96 (*SD* = 0.50), respectively. The details as presented in Table 7.

For the control group, mean scores of preterm infant weight gain at the 14th day from birth (T1), at the 28th day from day 14th (T2), and at the 28th day from birth (T3) were 101.52 (*SD* = 86.94), 291.74 (*SD* = 109.08), and 393.26 (*SD* = 139.93), respectively. Mean scores of preterm infant length gain at the 14th day from birth (T1), at the 28th day from day 14th (T2), and at the 28th day from birth (T3) were 0.78 (*SD* = 0.25), 0.98 (*SD* = 0.44), and 1.76 (*SD* = 0.56), respectively. Mean scores of preterm infant head circumference gain at the 14th day from birth (T1), at the 28th day from day 14th (T2), and at the 28th day from birth (T3) were 0.63 (*SD* = 0.48), 0.96 (*SD* = 0.47), and 1.59 (*SD* = 0.51), respectively. The details as presented in Table 7.

The results showed the mean scores of preterm infant weight gain, length gain, and head circumference gain in the experimental group were higher than in the control group among three time periods. Anyway, it was also found that the mean scores of preterm infant weight gain, length gain, and head circumference gain of experimental and control groups showed a trend toward increasing over time, as presented in Table 7.

Table 7 Means and standard deviations of preterm infant weight gain, length gain, and head circumference gain for both of experimental and control groups

Variable	Time measured	Experimental group (*n*=23)		Control group (*n*=23)	
		$\bar{X}$	*SD*	$\bar{X}$	*SD*
Weight gain					
	T1	111.52	98.83	101.52	86.94
	T2	361.30	85.46	291.74	109.08
	T3	472.83	143.24	393..26	139.93
Length gain					
	T1	1.09	0.51	0.78	0.25
	T2	1.22	0.52	0.98	0.44
	T3	2.30	0.72	1.76	0.56
Head circumference gain					
	T1	0.87	0.46	0.63	0.48
	T2	1.08	0.36	0.96	0.47
	T3	1.96	0.50	1.59	0.51

3.2 Preterm infant neurobehavioral development

In this part described mean scores and standard deviations of preterm infant neurobehavioral development among three-times measured in experimental and control groups.

For the experimental group, mean scores of preterm infant neurobehavioral development at baseline (T1), 14th day (T2), and 28th day (T3) measured by the Neonatal Neurobehavioral Examination (NNE), were 37.30 (*SD* = 5.64), 48.83 (*SD* = 4.93), and 60.57 (*SD* = 4.91), respectively. The mean scores of its three subscales of the three times were also calculated. Tone and motor pattern had mean scores of 12.65 (*SD* = 2.60), 16.17 (*SD* = 1.85), and 20.35 (*SD* = 2.17). Primitive reflexes had mean scores of 12.96 (*SD* = 1.58), 16.09 (*SD* = 1.81), and

19.26 (*SD* = 1.36). Behavioral responses had mean scores of 11.70 (*SD* = 2.03), 16.57 (*SD* = 1.50) and 20.96 (*SD* = 1.58), respectively.

For the control group, mean scores of preterm infant neurobehavioral development at baseline (T1), 14th day (T2), and 28th day (T3) measured by the Neonatal Neurobehavioral Examination (NNE), were 35.78 (*SD* = 5.34), 48.83 (*SD* = 4.93), and 50.87 (*SD* = 5.29), respectively. The mean scores of its three subscales of the three times were also calculated. Tone and motor pattern had mean scores of 11.96 (*SD* = 2.25), 13.91 (*SD* = 1.98), and 17.74 (*SD* = 1.57). Primitive reflexes had mean scores of 12.27 (*SD* = 1.63), 14.13 (*SD* = 1.89), and 17.04 (*SD* = 1.92). Behavioral responses had mean scores of 11.57 (*SD* = 1.83), 13.78 (*SD* = 1.86), and 16.09 (*SD* = 2.13), respectively.

It showed that the preterm infant neurobehavioral development of both groups was increasing over time, as presented in Table 8.

Table 8 Means and standard deviations of preterm infant neurobehavioral development for both of experimental and control groups

Neurobehavioral development	**Time measured**	**Experimental group (*n*=23)**		**Control group (*n*=23)**	
		$\bar{X}$	***SD***	$\bar{X}$	***SD***
Total score	T1	37.30	5.64	35.78	5.34
	T2	48.43	4.93	41.83	5.55
	T3	60.57	4.91	50.87	5.29
Subscale score					
Tone and motor patterns	T1	12.65	2.60	11.96	2.25
	T2	16.17	1.85	13.91	1.98
	T3	20.35	2.17	17.74	1.57
Primitive reflexes	T1	12.97	1.58	12.26	1.63
	T2	16.09	1.81	14.13	1.89
	T3	19.26	1.36	17.04	1.92

Table 8 (Continued)

Neurobehavioral development	Time measured	Experimental group (*n*=23)		Control group (*n*=23)	
		$\bar{X}$	*SD*	$\bar{X}$	*SD*
Behavioral responses	T1	11.70	2.03	11.57	1.83
	T2	16.57	1.50	13.78	1.86
	T3	20.96	1.58	16.09	2.13

3.3 Parental self-efficacy

In this part was described mean scores and standard deviations of parental self-efficacy among three-time measured in experimental and control groups.

For the experimental group, mean scores of parental self-efficacy at pre-intervention (T1), post-intervention (T2), and follow up (T3), as measured by PMP S-E, were 57.30 (*SD* = 12.58), 71.09 (*SD* = 7.58), and 77.26 (*SD* = 5.19), respectively. Mean scores of its four subscales of the three times were also calculated. Care taking procedures had mean scores of 11.39 (*SD* = 2.78), 13.96 (*SD* = 1.99), and 15.26 (*SD* = 1.14). Evoking behavior had mean scores of 20.30 (*SD* = 5.41), 25.09 (*SD* = 2.97), and 27.09 (*SD* = 2.00). Reading behavior or signaling had mean scores of 15.61 (*SD* = 4.51), 20.48 (*SD* = 2.84), and 23.04 (*SD* = 1.92). Means scores of situational beliefs were 10.00 (*SD* = 1.60), 11.57 (*SD* = .95), and 11.87 (*SD* = .46), respectively.

For the control group, mean scores of parental self-efficacy at pre-intervention (T1), post-intervention (T2), and follow up (T3), as measured by PMP S-E, were 56.74 (*SD* = 16.25), 62.43 (*SD* = 11.93), and 66.30 (*SD* = 13.19), respectively. Mean scores of its four subscales of the three times were also calculated. Care taking procedures had mean scores of 11.35 (*SD* = 3.35), 12.61 (*SD* = 2.64), and 12.96 (*SD* = 2.80). Evoking behavior had mean scores of 20.04 (*SD* = 6.19), 21.96 (*SD* = 4.51), and 23.43 (*SD* = 4.70). Reading behavior or signaling had mean scores of 15.70 (*SD* = 5.32), 17.43 (*SD* = 4.15), and 19.43 (*SD* = 4.47). Means

scores of situational beliefs were 9.65 (*SD* = 2.55), 10.44 (*SD* = 1.65), and 10.48 (*SD* = 1.83), respectively.

It showed that the parental self-efficacy of both groups was increasing over time, as presented in Table 9.

Table 9 Means and standard deviations of parental self-efficacy for both of experimental and control groups

Parental self-efficacy	**Time measured**	**Experimental group (*n*=23)**		**Control group (*n*=23)**	
		$\bar{X}$	***SD***	$\bar{X}$	***SD***
Total score	T1	57.30	12.58	56.74	16.25
	T2	71.09	7.58	62.43	11.93
	T3	77.26	5.19	66.30	13.19
Subscale score					
Care taking procedures	T1	11.39	2.78	11.35	3.35
	T2	13.96	1.99	12.61	2.64
	T3	15.26	1.14	12.96	2.80
Evoking behavior	T1	20.30	5.41	20.04	6.19
	T2	25.09	2.97	21.96	4.51
	T3	27.09	2.00	23.43	4.70
Reading behavior or signaling	T1	15.61	4.51	15.70	5.32
	T2	20.48	2.84	17.43	4.15
	T3	23.04	1.92	19.43	4.47
Situational beliefs	T1	10.00	1.60	9.65	2.55
	T2	11.57	0.95	10.44	1.65
	T3	11.87	0.46	10.48	1.83

4. Comparison of pre-intervention scores of outcome variables between experimental and control groups

At pre-intervention, the differences in scores of the outcome variables, including preterm infant growth (birth weight, length, and head circumference), preterm infant neurobehavioral development, and parent self-efficacy, between the experimental and control groups were compared by using independent *t*-tests. The results showed no significant difference in mean scores of preterm infant growth and infant neurobehavioral development, and parent self-efficacy at pre-intervention between experimental and control groups ($p > .05$) indicated that there were similar groups at pre-intervention. The details presented in Table 10.

Table 10 Comparison of mean scores of outcome variables between experimental and control groups at pre-intervention (T1)

Outcome variables	Experimental group (n=23)		Control group (n=23)		t	df	p-value
	$\bar{X}$	SD	$\bar{X}$	SD			
Birth Weight	1472.83	431.15	1372.17	312.15	0.907	44	.369
Length (at birth)	39.67	4.15	39.24	3.55	0.381	44	.705
HC (at birth)	27.30	2.49	27.30	2.88	0.000	44	1.000
Neurobehavioral development	37.30	5.63	35.78	5.34	0.940	44	.352
Parental self-efficacy	57.30	12.58	56.74	16.25	0.132	44	.896

5. Examine the effectiveness of the CPIDC program on preterm infant growth and neurobehavioral development, and parental self-efficacy

Two-way repeated measures ANOVA (one-between and one-within) was performed to examine the difference in mean scores of preterm infant growth (weight gain, length gain, and head circumference gain), neurobehavioral development, and parental self-efficacy between the two groups and over time.

Testing assumption of repeated measures ANOVA

1. Normality of the variables

Test for univariate normality of the data of control and experimental groups were 3 time of measurements showed normality by using Shapiro-Wilk's test ($p >$. 05), visual inspection of the participant's histogram, normal Q-Q plots, and box plot. Fisher's measure of skewness that calculated by dividing the skewness value by the standard error of skewness. Value is above -1.96 and below +1.96 indicates that the distribution is significantly normal. The results showed that the total scores of preterm infant growth consist of weight gain, length gain, head circumference gain (at the 14th day from birth (T1), at the 28th day from day 14th (T2), and at the 28th day from birth (T3), preterm infant neurobehavioral development (at baseline (T1), 14th day (T2), and 28th day (T3), and parental self-efficacy (at pre-intervention (T1) and follow-up (T3)) were normally distributed for both the experimental and control groups. The total scores of parental self-efficacy in T3 was not normally distributed for the experimental group but it can be violated because *F*-test is robust.

2. Outlier of the variables

The univariate outliers of variable were tested by Box-plot, which showed that the experimental group had cases outlier (Case No. 36 for data of weight gain at day 14th from birth, Case No. 38 for data of weight gain at day 28th from birth, Case No. 42, 30 at Time 1, Case No. 25, 27, 28, 29 and 32 for data of parental self-efficacy at Time 3). The control group had cases outlier (Case No. 1 and 8 for data length gain at the 28th day from day 14th (T2), Case No. 14 for data of weight gain at the 28th day from day 14th (T2). The multivariate outliers of variable were tested by using Mahalanobis distance with chi-square. There was no multivariate outlier by probability of values (Mahalanobis values < .001). Therefore, the total sample size was 23 cases per each group (experimental group 23 cases and control group 23 cases).

3. Sphericity

The sphericity tested about equality of the variance for test of within-subjects effect by Mauchly's test. The preterm infant weight gain, length gain, head circumference gain, neurobehavioral development, and parental self-efficacy

founded that the Mauchly's sphericity test was significant ($p < .05$). It indicated that the homogeneity of variance-covariance matrices was not equal. As a results, the sphericity assumption was not met. Therefore, the Greenhouse-Geisser was selected to report the results of repeated measure ANOVA.

4. Homogeneity of variance

The homogeneity of variance was tested by the Levene's test for the between-subject design. The results founded that the homogeneity of variance for the between-subjects was no significant ($p > .05$). It was indicated that the variance of dependent variable between groups was equal. Therefore, the homogeneity of variance assumption was met. In this study founded only parental self-efficacy at follow up (T3) was significant, therefor the homogeneity of variance assumption was met. However, the *F*-test is generally robust to violations of the assumption as long as group sizes are equal. Therefore, it can be accepted to violate this minor assumption.

5.1 Preterm infant growth

Two-way repeated measures ANOVA (one-between and one-within) was used to analyze the mean difference in total scores of preterm infant growth (weight gain, length gain, and head circumference gain) between two groups and over time. For comparisons of the differences between each pair of times, Bonferroni-corrected pairwise *t*-tests were used. In addition, an independent *t*-test was used to determine the mean differences in mean scores of weight gain velocity and growth velocity.

5.1.1 Weight gain

Two-way repeated measures ANOVA (one-between and one-within) was used to analyze the mean difference in total scores of weight gain between experimental and control groups at the 14th day from birth (T1), the 28th day from day 14 (T2), and the 28th day from birth (T3). For comparisons of the differences between each pair of times, Bonferroni-corrected pairwise *t*-tests were used.

The results showed that the main effect of the CPIDC program on mean preterm infant weight gain was not statistically significant between the experimental and control groups ($F_{1, 44} = 3.631$, $p > .05$, $\eta^2_p = .076$). Furthermore, mean weight gain scores were compared between groups and time points, and no

statistically significant differences in interaction (time*group) were discovered ($F_{1.693, 74.512} = 2.810$, $p > .05$, $\eta^2_p = .060$). However, there were significant differences in weight gain mean scores within groups when measured at three time points, however ($F_{1.693, 74.512} = 220.282$, $p < .001$, $\eta^2_p = .975$), indicating that mean weight gain scores differed over time within groups (Table 11).

It could be interpreted that the preterm infants who received the CPIDC program was not difference in weight gain than those who did not receive it.

Table 11 Repeated measure ANOVA of preterm infant weight gain scores

Source	*SS*	*df*	*MS*	F^d	*p*-value	η^2_p
Weight gain						
Within subject						
Time	2550904.348	1.693	1506333.754	220.282	<.001	.834
Time*Group	32534.783	1.693	19212.105	2.810	.075	.060
Error time	509527.536	74.512	6838.203			
Between subject						
Group	97069.565	1	97069.565	3.631	.063	.076
Error	1176228.986	44	26732.477			

[d] = Greenhouse-Geisser was used to adjust the degree of freedom, η^2_p = Partial Eta Squared

As illustrated in the interaction plot in Figure 4, the mean scores of weight gain of the experimental and control groups showed a trend toward increasing overtime. However, the mean scores of weight gain of the experimental group were higher than those of the control group at the 28th day from day 14 and the 28th day from birth.

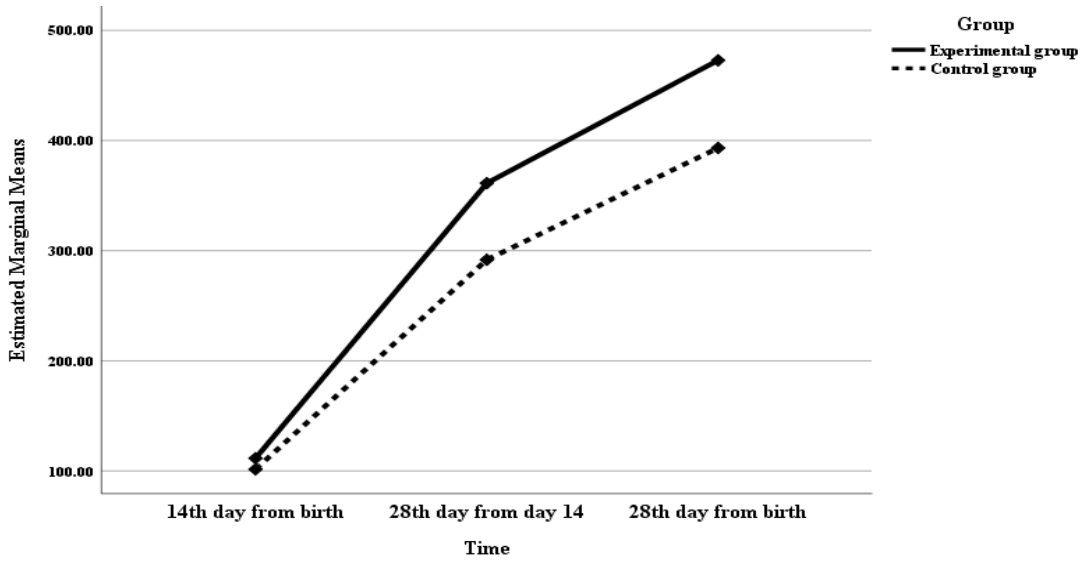

Figure 4 Comparisons of estimated marginal means of weight gain

The simple effect of group at each time point (between-subjects) revealed that the weight gain scores between the experimental and control groups was a statistically significant different at 28th day from 14th day (T2) ($F_{1,44} = 5.797$, $p < .05$, $\eta^2_p = .116$), while at 14th day from birth (T1) and at 28th day from birth (T3) were not statistically significant different between the experimental and control groups ($F_{1,44} = 0.133$, $p > .05$, $\eta^2_p = .003$, $F_{1,44} = 3.631$, $p > .05$, $\eta^2_p = .076$, respectively) (Table 12).

This finding demonstrated that at the 28th day from the 14th day, preterm infants in the experimental group had higher weight gain than those in the control group.

Table 12 Simple effect of group on weight gain scores at each point of times (between subjects simple effects)

Source	*SS*	*df*	*MS*	*F*	*p*-value	η^2_p
At 14th day from birth (T1)						
Between subjects	1150.000	1	1150.000	0.133	.717	.003
Error	381143.478	44	8662.352			
At 28th day from day 14 (T2)						
Between subjects	55652.174	1	55652.174	5.797	.020	.116
Error	422441.304	44	9600.939			
At 28th from birth (T3)						
Between subjects	72802.174	1	72802.174	3.631	.063	.076
Error	882171.739	44	20049.358			

η^2_p = Partial Eta Squared

For the simple effect of time (within-subjects), there were statistically significant differences in the experimental group for at least one pair of times ($F_{2,44}$ = 153.904, p < .001, η^2_p = .875) (Table 13). Bonferroni-corrected pairwise *t* tests indicated that the mean score of weight gain at the 28th day from birth (T3) was statistically significant higher than at the 28th day from day 14 (T2) and the 14th day from birth (T1) (M_{diff} = 111.522, *SE*= 20.607, p < .001, M_{diff} = 361.304, *SE*= 17.891, p < .001, respectively). In addition, the weight gain at 28th day from day 14 was significantly higher than 14th day from birth (M_{diff} = 249.783, *SE*= 24.336, p < .001) (Table 14).

It could be interpreted that the preterm infants who received the CPIDC program had higher mean scores of weight gain at the 28th day from day 14 and the 28th day from birth than at the 14th day from birth. Preterm infants in the CPIDC program increased their weight gain over time.

Table 13 Simple effect of time on weight gain scores in the experimental and control groups (within subjects simple effects)

Source	*SS*	*df*	*MS*	*F*	*p*-value	η^2_p
Experimental group						
Between subjects	601855.0725	22				
Interval	1574497.826	2	787248.9	153.904	<.001	.875
Error	225068.841	44	5115.201			
Total	2401421.739	68				
Control group						
Between subjects	574373.913	22				
Interval	1008941.304	2	504470.7	78.031	<.001	.780
Error	284458.696	44	6464.97			
Total	1867773.913	68				

η^2_p = Partial Eta Squared

Table 14 Bonferroni pairwise comparisons of the mean differences in weight gain between each pair of time differences within the experimental and control groups

Time		M_{diff}	*SE*	*p*-value	95% CI for Difference[b]	
					Lower	upper
Experimental group						
T1	T2	-249.783	24.336	<.001	-312.842	-186.723
T1	T3	-361.304	17.819	<.001	-407.477	-315.132
T2	T3	-111.522	20.607	<.001	-164.919	-58.125
Control group						
T1	T2	-190.217	26.766	<.001	-256.836	-123.599
T1	T3	-291.739	20.431	<.001	-342.592	-240.887
T2	T3	-101.522	19.407	<.001	-149.825	-53.219

b. Adjustment for multiple comparisons: Bonferroni.

5.1.2 Head circumference gain

Two-way repeated measures ANOVA (one-between and one-within) was used to analyze the mean difference in total scores of head circumference gain between experimental and control groups at the 14th day from birth (T1), the 28th day from day 14 (T2), and the 28th day from birth (T3). For comparisons of the differences between each pair of times, Bonferroni-corrected pairwise *t*-tests were used.

The results showed that the main effect of the CPIDC program on mean preterm infant head circumference gain was a statistically significant between the experimental and control groups (($F_{1, 44} = 6.125$, $p < .05$, $\eta^2_p = .122$). On the contrary, mean head circumference scores were compared between groups and time points, and no statistically significant differences in interaction (time*group) were discovered ($F_{1.304, 57.364} = 1.056$, $p > .05$, $\eta^2_p = .023$). However, there were significant differences in mean head circumference gain scores within groups when measured at three time points ($F_{1.304, 57.364} = 82.512$, $p < .001$, $\eta^2_p = .652$), indicating that mean head circumference gain scores differed over time within groups (Table 15).

It could be interpreted that the preterm infants who received the CPIDC program was increased head circumference gain than those who did not receive it.

Table 15 Repeated measure ANOVA of preterm infant head circumference gain scores

Source	*SS*	*df*	*MS*	F^d	*p*-value	η^2_p
HC gain						
Within subject						
Time	25.764	1.304	19.762	82.512	<.001	.652
Time*Group	0.330	1.304	0.253	1.056	.328	.023
Error time	13.739	57.364	0.240			
Between subject						
Group	2.094	1	2.094	6.125	.017	.122
Error	15.043	44	0.342			

[d] = Greenhouse-Geisser was used to adjust the degree of freedom, η^2_p = Partial Eta Squared

As illustrated in the interaction plot in Figure 5, the mean scores of head circumference gain of the experimental and control groups showed a trend toward increasing overtime. However, the mean scores of head circumference gain of the experimental group were higher than those of the control group at the 14th day from birth, the 28th day from day 14 and the 28th day from birth.

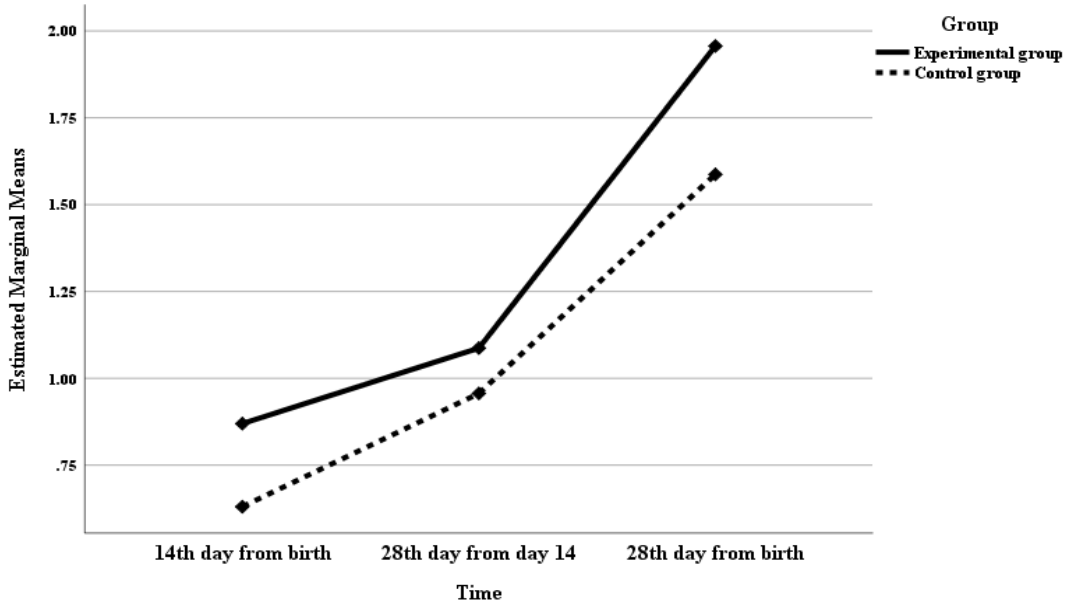

Figure 5 Comparisons of estimated marginal means of head circumferences gain

The simple effect of group at each time point (between-subjects) revealed that the difference in head circumference gain scores between the experimental and control groups was statistically significant at the 28th day from birth (T3) ($F_{1,44} = 6.125$, $p < .05$, $\eta^2_p = .122$), while at 14th day from birth (T1) and at 28th day from day 14 (T2) were not statistically significant different between the experimental and control groups ($F_{1,44} = 2.978$, $p > .05$, $\eta^2_p = .063$, $F_{1,44} = 1.106$, $p > .05$, $\eta^2_p = .025$, respectively) (Table 16).

This finding demonstrated that at the 28th day from birth, preterm infants in the experimental group had a higher head circumference gain than those in the control group.

Table 16 Simple effect of group on HC gain scores at each point of times (between subjects simple effects)

Source	*SS*	*df*	*MS*	*F*	*p*-value	η^2_p
At 14th day from birth (T1)						
Between subjects	0.658	1	0.658	2.978	.091	.063
Error	9.717	44	0.221			
At 28th day from day 14 (T2)						
Between subjects	0.196	1	0.196	1.106	.299	.025
Error	7.783	44	0.177			
At 28th day from birth (T3)						
Between subjects	1.571	1	1.571	6.125	.017	.122
Error	11.283	44	0.256			

η^2_p = Partial Eta Squared

For the simple effect of time (within-subjects), there were statistically significant differences in the experimental group for at least one pair of times ($F_{2,44}$ = 59.613, $p < .001$, η^2_p = .730) (Table 17). Bonferroni-corrected pairwise *t* tests indicated that the mean score of head circumference gain at 28th day from birth (T3) was statistically significant higher than at the 28th day from day 14 (T2) and at the 14th day from birth (T1) (M_{diff} = 0.870, *SE*= 0.098, $p < .001$, M_{diff} = 1.087, *SE*= 0.088, $p < .001$, respectively). On the contrary, the head circumference gain at the 28th day from day 14 (T2) was not statistically significant higher than at the 14th day from birth (T1) (M_{diff} = 0.217, *SE*= 0.153, $p > .05$) (Table 18).

It could be interpreted that the preterm infants who received the CPIDC program at the 28th day (T3) had higher mean scores of head circumference gain than at the 28th day from day 14 (T2) and at the 14th day from birth (T1). Preterm infants in the CPIDC program increased their head circumference gain over time.

Table 17 Simple effect of time on HC gain scores in the experimental and control groups (within subjects simple effects)

Source	*SS*	*df*	*MS*	*F*	*p*-value	η^2_p
Experimental group						
Between subjects	7.275	22				
Interval	15.217	2	7.609	59.613	<.001	.730
Error	5.616	44	0.128			
Total	28.109	68				
Control group						
Between subjects	7.768	22				
Interval	10.877	2	5.438	29.458	<.001	.572
Error	8.123	44	0.185			
Total	26.768	68				

η^2_p = Partial Eta Squared

Table 18 Bonferroni pairwise comparisons of the mean differences in HC gain between each pair of time differences within the experimental and control groups

Time		M_{diff}	*SE*	*p*-value	95% CI for Difference[b]	
					Lower	upper
Experimental group						
T1	T2	-0.217	0.153	.488	-0.598	0.164
T1	T3	-1.087	0.088	<.001	-1.305	-0.869
T2	T3	-0.870	0.098	<.001	-1.113	-0.626
Control group						
T1	T2	-0.326	0.153	.116	-0.707	0.055
T1	T3	-0.957	0.088	<.001	-1.175	-0.738
T2	T3	-0.630	0.098	<.001	-.874	-0.387

b. Adjustment for multiple comparisons: Bonferroni.

5.1.3 Length gain

Two-way repeated measures ANOVA (one-between and one-within) was used to analyze the mean difference in total scores of length gain between experimental and control groups at the 14th day from birth (T1), the 28th day from day 14 (T2), and the 28th day from birth (T3). For comparisons of the differences between each pair of times, Bonferroni-corrected pairwise *t*-tests were used.

The results showed that the main effect of the CPIDC program on mean length gain was a statistically significant between the experimental and control groups ($F_{1, 44} = 8.165$, $p < .01$, $\eta^2_p = .157$). On the contrary, mean length scores were compared between groups and time points, and no statistically significant differences in interaction (time*group) were discovered ($F_{1.622, 71.348} = 2.302$, $p > .05$, $\eta^2_p = .050$). However, there were significant differences in length gain mean scores within groups when measured at three time points ($F_{1.622, 71.348} = 125.892$, $p < .001$, $\eta^2_p = .741$), indicating that mean length gain scores differed over time within groups (Table 19).

It could be interpreted that the preterm infants who received the CPIDC program was increased length gain better than those who did not receive it.

Table 19 Repeated measure ANOVA of preterm infant length gain scores

Source	*SS*	*df*	*MS*	F^d	*p*-value	η^2_p
Length gain						
Within subject						
Time	32.286	1.622	19.911	125.829	<.001	.741
Time*Group	0.591	1.622	0.364	2.302	.118	.050
Error time	11.290	71.348	0.158			
Between subject						
Group	4.529	1	4.529	8.165	.006	.157
Error	24.406	44	0.555			

[d] = Greenhouse-Geisser was used to adjust the degree of freedom, η^2_p = Partial Eta Squared

As illustrated in the interaction plot in Figure 6, the mean scores of length gain of the experimental and control groups showed a trend toward increasing overtimes. However, the mean scores of length gain of the experimental group were higher than those of the control group at the 14th day from birth, the 28th day from day 14, and the 28th day from birth.

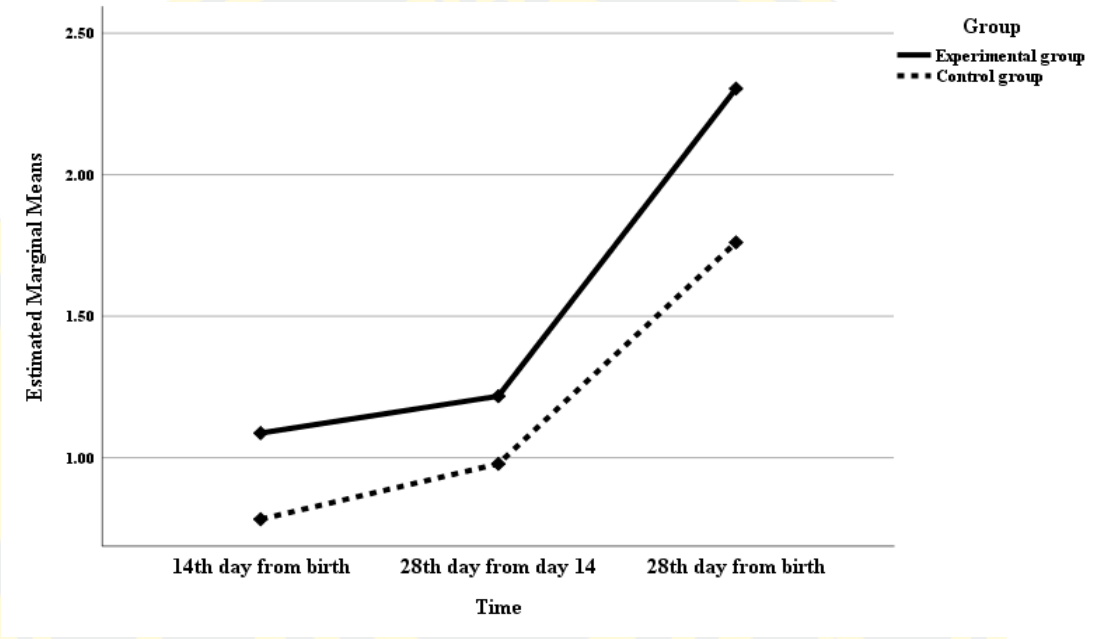

Figure 6 Comparisons of estimated marginal means of length gain

The simple effect of group at each time point (between-subjects) revealed that the length gain scores between the experimental and control groups were statistically significant different at 14th day from birth (T1) and at 28th day from birth (T3) ($F_{1,44} = 6.474$, $p < .05$, $\eta^2_p = .128$, $F_{1,44} = 8.165$, $p < .01$, $\eta^2_p = .157$, respectively), while at 28th day from day 14 (T2) was not statistically significant different between the experimental and control group ($F_{1,44} = 2.805$, $p > .05$, $\eta^2_p = .061$) (Table 20).

This finding demonstrated that at 14th day from birth and at 28th day from birth, preterm infants in the experimental group had higher length gain than those in the control group.

Table 20 Simple effect of group on length gain scores at each point of times (between subjects simple effects)

Source	*SS*	*df*	*MS*	*F*	*p*-value	η^2_p
At 14th day from birth (T1)						
Between subjects	1.065	1	1.065	6.474	.015	.128
Error	7.239	44	0.165			
At 28th day from day 14 (T2)						
Between subjects	0.658	1	0.658	2.850	.098	.061
Error	10.152	44	0.231			
At 28th from birth (T3)						
Between subjects	3.397	1	3.397	8.165	.006	.157
Error	18.304	44	0.416			

η^2_p = Partial Eta Squared

For the simple effect of time (within-subjects), there were statistically significant differences in the experimental group for at least one pair of times ($F_{2,44}$ = 56.875, $p < .001$, η^2_p = .721) (Table 21). Bonferroni-corrected pairwise *t* tests indicated that the mean score of length gain at the 28th day from birth (T3) was statistically significant higher than at the 28th day from day 14 (T2) and at the 14th day from birth (M_{diff} = 1.807, *SE*= 0.085, $p < .001$, M_{diff} = 1.217, *SE*= 0.100, $p < .001$, respectively). On the contrary, the length gain at the 28th day from day 14 (T2) was not statistically significant higher than at the 14th day from birth (M_{diff} = 0.130, *SE*= 0.128, $p > .05$) (Table 22).

It could be interpreted that the preterm infants who received the CPIDC program at the 28th day from birth (T3) had higher mean scores of length gain than those at the 28th day from day 14 (T2) and the 14th day from birth (T1). Preterm infants in the CPIDC program increased their length gain over time.

Table 21 Simple effect of time on length gain scores in the experimental and control groups (within subjects simple effects)

Source	*SS*	*df*	*MS*	*F*	*p*-value	η^2_p
Experimental group						
Between subjects	15.159	22				
Interval	20.551	2	10.275	56.875	<.001	.721
Error	7.949	44	0.181			
Total	43.659	68				
Control group						
Between subjects	9.246	22				
Interval	12.326	2	6.163	81.176	<.001	.787
Error	3.341	44	0.076			
Total	24.913	68				

η^2_p = Partial Eta Squared

Table 22 Bonferroni pairwise comparisons of the mean differences in length gain between each pair of time differences within the experimental and control groups

Time		M_{diff}	*SE*	*p*-value	95% CI for Difference[b]	
					Lower	upper
Experimental group						
T1	T2	-0.130	0.128	.937	-0.448	0.187
T1	T3	-1.217	0.100	<.001	-1.467	-0.968
T2	T3	-1.087	0.085	<.001	-1.297	-0.876
Control group						
T1	T2	-0.196	0.128	.397	-0.513	0.122
T1	T3	-0.978	0.100	<.001	-1.228	-0.729
T2	T3	-0.783	0.085	<.001	-0.993	-0.572

b. Adjustment for multiple comparisons: Bonferroni.

5.1.4 Weight gain velocity

An independent *t*-test was used to examine the difference in mean scores of weight gain velocity between experimental and control groups at the 14th day, 28th day from birth, and 28th day from day 14. The results showed that there was no statistically significant difference in weight gain velocity mean scores between experimental and control groups on the 14th day from birth (t =.364, p >.05) and the 28th day from birth (t = 1.905, p >.05), as shown in Table 23.

It could be concluded that preterm infants who received the comprehensive preterm infant developmental care program had no significantly mean scores of weight gain velocity than those who received the usual care at the 14th day from birth and the 28th day from birth.

However, there was a statistically significant difference in weight gain velocity between experimental and control groups at 28th day from 14th day (t = 2.407, p < .05) as shown in Table 23.

It could be concluded that preterm infants who received the comprehensive preterm infant developmental care program had significantly higher mean scores of weight gain velocity than those who received the usual care at the 28th day from the 14th day.

Table 23 Comparison of mean weight gain velocity between experimental and control groups

Weight gain velocity (g/d)	**Experimental group (*n*=23)**		**Control group (*n*=23)**		***t***	***df***	***p*-value**
	$\bar{X}$	***SD***	$\bar{X}$	***SD***			
From birth							
At 14th day	7.97	7.06	7.25	6.21	0.364	44	.717
At 28th day	16.89	5.11	14.05	5.00	1.905	44	.063
From day 14							
At 28th day	25.81	6.10	20.84	7.80	2.407	44	.020

5.1.5 Growth velocity

An independent *t*-test was used to examine the difference in mean scores of growth velocity between experimental and control groups at the 14th day, 28th day from birth, and 28th day from day 14. The result revealed that the mean scores of growth velocity were no statistically significant difference between the experimental and control groups at the 14th day from birth (t = -0.054, p > .05) and the 28th day from birth (t = 1.504, p >.05), as shown in Table 24.

It could be concluded that preterm infants who received the comprehensive preterm infant developmental care program had no significantly mean scores of growth velocity than those who received the usual care at the 14th day from birth and the 28th day from birth.

However, there was a statistically significant difference in growth velocity between experimental and control groups at 28th day from 14th day (t = 2.291, p < .05), as shown in Table 24.

It could be concluded that preterm infants who received the comprehensive preterm infant developmental care program had significantly higher mean scores of growth velocity than those who received the usual care at the 28th day from the14th day.

Table 24 Comparison of mean growth velocity between experimental and control groups

Growth velocity (g/kg/d)	**Experimental group (*n*=23)**		**Control group (*n*=23)**		***t***	***df***	***p*-value**
	$\bar{X}$	***SD***	$\bar{X}$	***SD***			
From birth							
At 14th day	5.29	4.42	5.36	4.47	-0.054	44	.957
At 28th day	10.32	2.83	9.09	2.71	1.504	44	.140
From day 14							
At 28th day	15.34	3.67	12.81	3.81	2.291	44	.027

5.2 Preterm infant neurobehavioral development

Two-way repeated measures ANOVA (one-between and one-within) was used to analyze the mean difference in total scores of preterm infant neurobehavioral development between experimental and control groups at baseline, post-intervention (day 14), and follow-up (day 28). For comparisons of the differences between each pair of times, Bonferroni-corrected pairwise *t*-tests were used.

The results showed that the main effect of the CPIDC program on mean preterm infant neurobehavioral development score was statistically significant between the experimental and control groups ($F_{1, 44}$ = 16.155, p <.001, η^2_p = .269). In addition, there were significant differences in neurobehavioral development mean scores within groups when measured at three time points ($F_{1.692,74.427}$ = 1689.099, p < .001, η^2_p = .975). Furthermore, mean preterm infant neurobehavioral development scores were compared between groups and time points, and statistically significant differences in interaction (time*group) were discovered ($F_{1.692,74.427}$ = 99.520, p < .001, η^2_p = .644), indicating that mean preterm infant neurobehavioral development scores differed over time between experimental and control groups (Table 25).

It could be interpreted that the participants who received the CPIDC program had a statistically significant increasing in preterm infant neurobehavioral development better than those who did not receive it.

Table 25 Repeated measure ANOVA of total scores of preterm infant neurobehavioral development

Source	*SS*	*df*	*MS*	F^d	*p*-value	η^2_p
Neurobehavioral development						
Within subject						
Time	8475.536	1.692	5010.618	1689.099	<.001	.975
Time*Group	399.014	1.692	235.892	79.520	<.001	.644
Error time	220.783	74.427	2.966			
Between subject						
Group	1272.181	1	1272.181	16.155	<.001	.269
Error	3464.870	44	78.747			

[d] = Greenhouse-Geisser, η^2_p = Partial Eta Squared

As illustrated in the interaction plot in Figure 7, the mean scores of neurobehavioral development of the experimental and control groups were a trend toward increasing overtimes. However, the experimental group's mean scores of neurobehavioral development had higher than the control group's group at 14th day and 28th day.

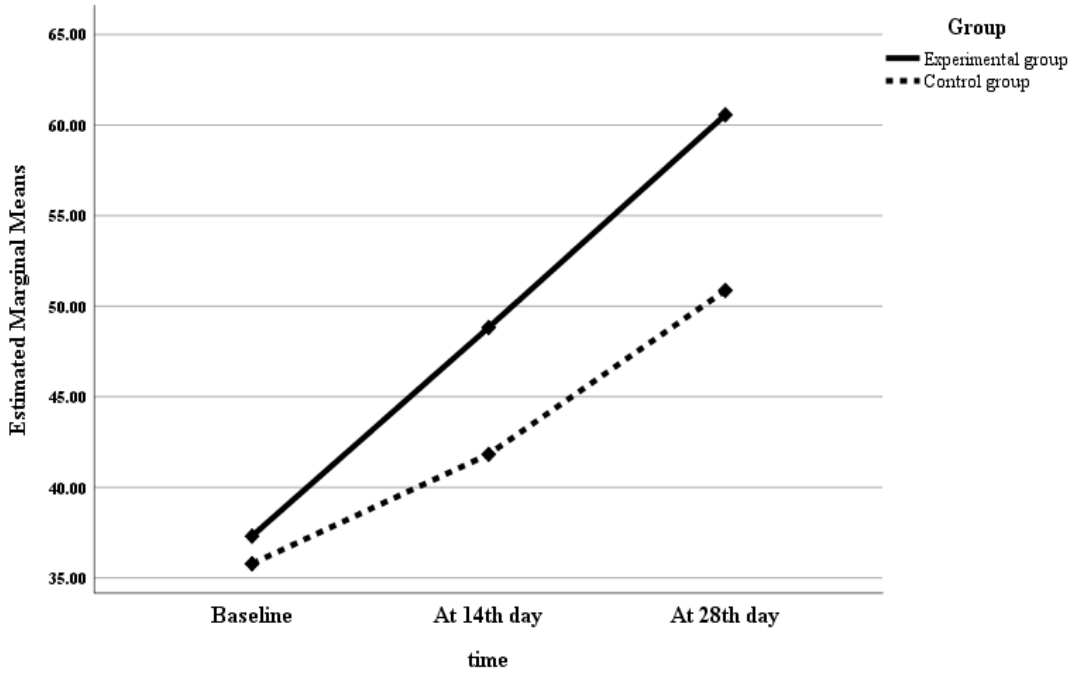

Figure 7 Comparisons of estimated marginal means of neurobehavioral development

The simple effect of group at each time point (between-subjects) revealed that the mean neurobehavioral development scores between the experimental and control groups were statistically significant different at 14th day (post-intervention: T2) and 28th day (follow-up: T3) ($F_{1,44} = 20.447$, $p < .001$, $\eta^2_p = .317$, $F_{1,44} = 41.497$, $p < .001$, $\eta^2_p = .485$, respectively) (Table 26).

This finding demonstrated that preterm infants in the experimental group had higher neurobehavioral development than those in the control group on the 14th day and the 28th day.

Table 26 Simple effect of group on neurobehavioral development scores at each point of times (between subjects simple effects)

Source	*SS*	*df*	*MS*	*F*	*p*-value	η^2_p
Baseline (T1)						
Between subjects	26.630	1	26.630	0.883	.352	.020
Error	1326.783	44	30.154			
At 14th day (T2)						
Between subjects	563.500	1	563.500	20.447	<.001	.317
Error	1212.609	44	27.559			
At 28th day (T3)						
Between subjects	1081.065	1	1081.065	41.497	<.001	.485
Error	1146.261	44	26.051			

η^2_p = Partial Eta Squared

For the simple effect of time (within-subjects), there were statistically significant differences in the experimental group for at least one pair of times ($F_{2,44}$ = 1067.793, p < .001, η^2_p = .980) (Table 27). Bonferroni-corrected pairwise *t* tests indicated that the mean score of preterm infant neurobehavioral development at 28th day (T3) was statistically significantly higher than at 14th day (T2), and at baseline (T1) (M_{diff} = 11.739, SE = 0.355, p < .001, M_{diff} = 23.261, SE = 0.503, p < .001, respectively). Furthermore, the preterm infant's neurobehavioral development was statistically significant higher at the 14th day (T2) than at baseline (T1) (M_{diff} = 11.522, SE = 0.525, p < .001) (Table 28).

It could be interpreted that the preterm infants who received the CPIDC program had higher mean scores of neurobehavioral development at 14th day (T2) and 28th day (T3) than at baseline (T1). Preterm infants in the CPIDC program improved their neurobehavioral development over time.

Table 27 Simple effect of time on neurobehavioral development scores in the experimental and control groups (within subjects simple effects)

Source	*SS*	*df*	*MS*	*F*	*p*-value	η^2_p
Experimental group						
Between subjects	1635.623	22				
Interval	6222.464	2	3111.232	1067.793	<.001	.980
Error	128.203	44	2.914			
Total	7986.290	68				
Control group						
Between subjects	1829.246	22				
Interval	2652.087	2	1326.043	630.224	<.001	.966
Error	92.580	44	2.104			
Total	4573.913	68				

η^2_p = Partial Eta Squared

Table 28 Bonferroni pairwise comparisons of the mean differences in preterm infant neurobehavioral development between each pair of time differences within the experimental and control groups.

Time		M_{diff}	*SE*	*p*-value	95% CI for Difference[b]	
					Lower	upper
Experimental group						
T1	T2	-11.522	0.525	<.001	-12.828	-10.216
T1	T3	-23.261	0.503	<.001	-24.513	-22.008
T2	T3	-11.739	0.355	<.001	-12.622	-10.856
Control group						
T1	T2	-6.043	0.525	<.001	-7.350	-4.737
T1	T3	-15.087	0.503	<.001	-16.339	-13.834
T2	T3	-9.043	0.355	<.001	-9.927	-8.160

b. Adjustment for multiple comparisons: Bonferroni.

5.3 Parental self-efficacy

Two-way repeated measures ANOVA (one-between and one-within) was used to analyze the mean difference in total scores of parental self-efficacy between experimental and control groups at pre-intervention (day 0), post-intervention (day 14), and follow-up (day 28). For comparisons of the differences between each pair of times, Bonferroni-corrected pairwise *t*-tests were used.

The results showed that the main effect of the CPIDC program on mean parental self-efficacy score was statistically significant between the experimental and control groups ($F_{1, 44} = 6.070$, $p < .05$, $\eta^2_p = .121$). In addition, there were significant differences in parental self-efficacy mean scores within groups when measured at three time points ($F_{1.301, 57.226} = 33.548$, $p < .001$, $\eta^2_p = .433$). Furthermore, mean parental self-efficacy scores were compared between groups and time points, and statistically significant differences in interaction (time*group) were discovered ($F_{1.301, 57.226} = 44.434$, $p < .05$, $\eta^2_p = .092$), indicating that mean parental self-efficacy scores differed over time between experimental and control groups (Table 29).

It could be interpreted that the participants who received the CPIDC program had a statistically significant increasing in parental self-efficacy better than those who did not receive it.

Table 29 Repeated measure ANOVA of total scores of parental self-efficacy

Source	*SS*	*df*	*MS*	*F*[d]	*p*-value	η^2_p
Parental Self-efficacy						
Within subject						
Time	5181.928	1.301	3984.270	33.548	<.001	.433
Time*Group	684.971	1.301	526.659	4.434	.030	.092
Error time	6796.435	57.226	118.764			
Between subject						
Group	1560.116	1	1560.116	6.070	.018	.121
Error	11309.652	44	257.038			

[d] = Greenhouse-Geisser, η^2_p = Partial Eta Squared

As illustrated in the interaction plot in Figure 8, the mean scores of parental self-efficacy in the experimental and control groups increased significantly over time. However, the experimental group's mean scores of parental self-efficacy were higher than the control group's at post-intervention and follow-up, and the experimental group also instantly increased in parental self-efficacy than the control group.

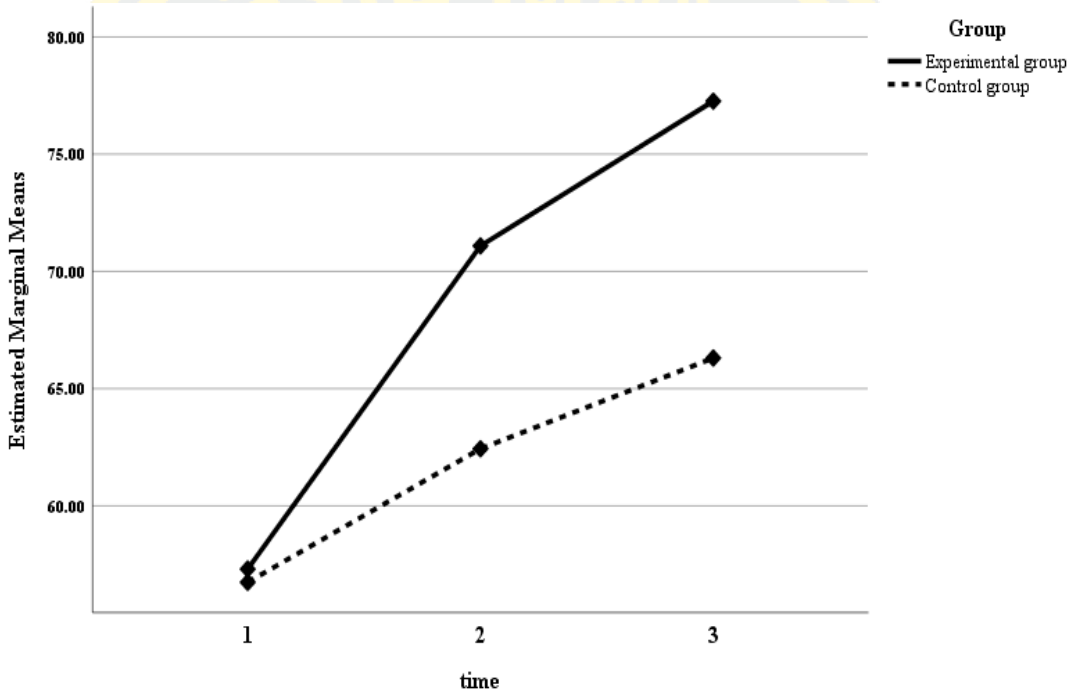

Figure 8 Comparisons of estimated marginal means of parental self-efficacy

The simple effect of group at each time point (between-subjects) revealed that the mean parental self-efficacy scores between the experimental and control groups were statistically significant different at post-intervention (T2) and follow-up (T3) ($F_{1,44} = 8.618$, $p < .01$, $\eta^2_p = .164$, $F_{1,44} = 13.751$, $p < .01$, $\eta^2_p = .238$, respectively) (Table 30).

This finding demonstrated that at the post-intervention and follow-up, participants in the experimental group had higher parental self-efficacy than those in the control group.

Table 30 Simple effect of group on parental self-efficacy scores at each point of times (between subjects simple effects)

Source	*SS*	*df*	*MS*	*F*	*p*-value	η^2_p
Pre-intervention (T1)						
Between subjects	3.674	1	3.674	0.017	.896	.000
Error	9293.304	44	211.211			
Post-intervention (T2)						
Between subjects	860.891	1	860.891	8.618	.005	.164
Error	4395.478	44	99.897			
Follow-up (T3)						
Between subjects	1380.522	1	1380.522	13.751	.001	.238
Error	4417.304	44	100.393			

η^2_p = Partial Eta Squared

For the simple effect of time (within-subjects), there were statistically significant differences in the experimental group for at least one pair of times ($F_{2,44}$ = 41.159, p < .001, η^2_p = .652) (Table 31). Bonferroni-corrected pairwise *t* tests indicated that the mean score of parental self-efficacy at follow-up was statistically significant higher than at post-intervention, and pre-intervention (M_{diff} = 6.174, *SE*= 1.643, p < .01, M_{diff} = 19.957, *SE*= 3.345, p < .001, respectively). In addition, the parental self-efficacy at post-intervention was significantly higher than pre-intervention (M_{diff} = 13.783, *SE*= 2.501, p < .001) (Table 32).

It could be interpreted that the participants who received the CPIDC program had higher mean scores of parental self-efficacy at post-intervention and follow-up than at pre-intervention. Participants in the CPIDC program improved their parental self-efficacy over time.

Table 31 Simple effect of time on parental self-efficacy scores in the experimental and control groups (within subjects simple effects)

Source	*SS*	*df*	*MS*	*F*	*p*-value	η^2_p
Experimental group						
Between subjects	2772.406	22				
Interval	4801.942	2	2400.971	41.159	<.001	.652
Error	2566.725	44	58.335			
Total	10141.072	68				
Control group						
Between subjects	8537.246	22				
Interval	1064.957	2	532.478	5.539	.007	.201
Error	4229.710	44	96.130			
Total	13831.913	68				

η^2_p = Partial Eta Squared

Table 32 Bonferroni pairwise comparisons of the mean differences in parental self-efficacy between each pair of time differences within the experimental and control groups.

Time		M_{diff}	*SE*	*p*-value	95% CI for Difference[b]	
					Lower	upper
Experimental group						
T1	T2	-13.783	2.501	<.001	-20.008	-7.557
T1	T3	-19.957	3.345	<.001	-28.283	-11.630
T2	T3	-6.174	1.643	.002	-10.263	-2.084
Control group						
T1	T2	-5.696	2.501	.083	-11.921	0.530
T1	T3	-9.565	3.345	.019	-17.892	-1.238
T2	T3	-3.870	1.643	.069	-7.959	0.220

b. Adjustment for multiple comparisons: Bonferroni.

CHAPTER 5
CONCLUSION AND DISCUSSION

This chapter had five parts. Initially, a summary of the study concerned the developmental CPIDC program, examination of the CPIDC program on neurobehavioral development, growth of preterm infant, and parental self-efficacy. Secondly, a discussion of the research findings was reflected. Thirdly, strengths and limitations were described. Fourthly, the suggestions and recommendations were presented. Finally, it was the conclusion.

Summary of the study

This study aimed to develop the comprehensive preterm infant developmental care intervention and examine the effectiveness of the CPIDC program by comparing preterm infant growth and neurobehavioral development, and parental self-efficacy between the control and the experimental groups. A mixed method was used in developing an intervention of the CPIDC program and testing its effect on preterm infant growth, preterm infant neurobehavioral development, and parental self-efficacy. The intervention in the current study was developed based on a synactive theory, related research evidence, and perspectives of parents (five mothers and five fathers) in a Thai family context in Chon Buri province. Likewise, a pilot study was conducted to revise the intervention. After that, this study tested the effectiveness of the intervention through a randomized control trial. The effectiveness of the CPIDC program was verified at the pre-intervention (baseline), 14th postnatal day (post-intervention), and 28th postnatal day (follow-up). The sample of 23 and 23 mother-preterm infant dyads were recruited to the control and experimental groups. The strategy of randomly assigning NICU settings into both groups was used, while the participants were allocated into respective groups based on those NICU settings. The routine care and the CPIDC program were provided for control and experimental groups, respectively.

Measurements were collected in both groups using the preterm infant growth scores. The body weight was measured by a digital weight scale (Seca model 727

with accuracy of ±2 grams), and length and head circumference were measured by a measuring tape at pre-intervention (at birth), the 14th postnatal day (post-intervention), and the 28th postnatal day. The preterm infant neurobehavioral development scales adapted from NNE were used at pre-intervention (at baseline), the 14th postnatal day (post-intervention), and 28th postnatal day. Lastly, parental self-efficacy scales adapted from PMP S-E were implemented at pre-intervention, the 14th postnatal day (post-intervention), and the 28th postnatal day. The Cronbach alpha of PMP S-E was .94. The inter-rater reliability of NNE was .93.

The independent t-tests, chi-square tests, and Fisher's exact tests were used in testing the difference between the experimental and control groups in terms of their demographic data, preterm infant growth (birth weight, birth length, and birth head circumference), preterm infant neurobehavioral development, and parental self-efficacy at pre-intervention. The examination of the CPIDC program on preterm infant growth (weight gain, length gain, and head circumference gain) on the 14th day from birth (T1), the 28th day from the 14th day (T2), and the 28th day from birth (T3) used two-way repeated measures ANOVA to compare between the experimental and control groups over time. Furthermore, an independent t-test was performed to evaluate the experimental and control groups in light of preterm infant growth (weight gain velocity and growth velocity) on the 14th day from birth (T1), the 28th day from birth (T2), and the 28th day from birth (T3). To compare the experimental and control groups over time, two-way repeated measures ANOVA was used to compare preterm infant neurobehavioral development at baseline (T1), the 14th day, and the 28th day, as well as parental self-efficacy at pre-intervention, post-intervention (14th day), and follow-up (28th day).

The research findings:

Part I: Developmental CPIDC program

This part focused on the revision of the CPIDC program based on the perspective of parents. Then, a pilot study was completed to test the feasibility and acceptability of the intervention.

From the perspective of parents, parental participation in preterm infant developmental care during NICU hospitalization was presented as a need for close interaction with their infants. However, parents have less confidence in their ability

to participate in developmental care for preterm infants. They needed support from nurses to help them understand their infants' behavior and promote preterm infant development care such as touch, hold, feeding, and skin-to-skin contact even though their infants were in the NICU. "Collaborative participation as a key to success to promote parental participation in the developmental care of preterm infants during NICU hospitalization," was the overarching theme expressed in the overall temporal meaning of parental participation in the developmental care of preterm infants during hospitalization. This overarching theme has been generated from the three themes, namely, parental factor, health care service factor, and family factor.

The researcher then developed the new intervention by integrating the perspectives of parents. As a result, with the theory and evidence, the CPIDC program consisted of six stages in four sessions, all of which were completed in one week. According to the findings from the parents' perspective, the researcher increased the number of activities in this program such as fathers expressing a need for preterm infant care information along with mothers. As a result, the researcher invited fathers to participate in this study alongside mothers in each session, then informed them about preterm infant care, and encouraged them to interact with their infants. Furthermore, the researcher informed mothers and fathers about preterm infant medical equipment.

The results of the pilot study showed that the length of stay of preterm infants in the NICU was 5–38 days, and the duration of time admitted to hospital was 32–68 days. Therefore, the duration of the CPIDC program developed by the researcher is appropriate, and all participants accepted and were satisfied with the CPIDC program.

Part II: Examination the effectiveness of CPIDC program

The parent and preterm infant characteristics of experimental and control groups were compared using mean, standard deviation, frequency, percentage, chi-square test, Fisher's exact test for categorical data, and an independent *t*-test for continuous data. At the pre-intervention stage, there were no statistically significant differences between groups. Then, to test hypotheses of this study, a two-way repeated measures ANOVA was performed. The findings of this study revealed that:

1. Preterm infants who received the CPIDC program had significantly higher mean scores of neurobehavioral development than those who received the usual care at post-intervention (at 14th day from birth: T2) and follow-up (at 28th day from birth: T3).

2. The preterm infants who received the CPIDC program, at post-intervention (at 14th day from birth: T2) and follow-up (at 28th day from birth: T3) had significantly higher mean scores of neurobehavioral development than those at pre-test (baseline: T1).

3. The preterm infants who received the CPIDC program had significantly higher mean scores of preterm infant length gain than those who received the usual care at the 14th day from birth (T1) and at the 28th day from birth (T3). In addition, the preterm infants who were treated with the CPIDC program had significantly higher mean scores of preterm infant head circumference gain than those receiving the usual care at the 28th day from birth (T3). The preterm infants in the CPIDC program had significantly higher mean scores of preterm infant weight gain than those who received the usual care at the 28th day from the 14th day (T2). Furthermore, in comparison to those receiving the usual care, preterm infants who received the CPIDC program had significantly higher mean scores of weight gain velocity and growth velocity at the 28th day from the 14th day (T2).

4. The preterm infants who received the CPIDC program, at the 28th day from the 14th day (T2) and at the 28th day from birth (T3) had significantly higher mean scores of preterm infant weight gain than those at 14th day from birth (T1). However, the preterm infants who received the CPIDC program, only at the 28th day from birth (T3) had significantly higher mean scores of preterm infant length gain and head circumference gain than those at the 28th day from the 14th day (T2) and at 14th day from birth (T1).

5. Parents who received the CPIDC program had significantly higher mean scores of parental self-efficacy than those who received the usual care at post-intervention (T2) and follow-up (T3).

6. The parents who received the CPIDC program at post-intervention (T2) and follow-up (T3) had significantly higher mean scores of parental self-efficacy than those at the pre-intervention (T1).

Discussion

The study findings of the effectiveness of the program reflected each outcome variable (preterm infant neurobehavioral development, preterm infant growth, and parental self-efficacy) as follows:

Preterm infant neurobehavioral development

The current findings revealed that the neurobehavioral development scores of preterm infants who received the CPIDC program was significantly higher than that of those who received usual care at the 14th and 28th postnatal day. Besides, the mean neurobehavioral development scores of preterm infants who received the CPIDC program and those who received the usual care both increased significantly over time, but the former had the instant increase in neurobehavioral development compared to the latter. These findings supported the hypotheses 1 and 2, which confirmed the useful effectiveness of the CPIDC program adapted from the synactive theory (Als, 1982), the NIDC model (Altimier & Phillips, 2013; 2016), related synthesized research evidence (Benzies et al., 2013; Brecht et al., 2012; Brett et al., 2011; Burke, 2018; Puthussery et al., 2018; Vanderveen et al., 2009) and contexts from the perspective of Thai parents. The increase in neurobehavioral development scores in the experimental group might be from a comprehensive program in six care practices, namely, healing environment, positioning and handling, safeguarding sleep, minimizing stress and pain, protecting skin, and optimizing nutrition.

The findings in this study could be explained as follow. The CPIDC program enabled mothers to understand preterm infant behaviors and had them trained to participate in their preterm infant care for promote growth and neurobehavioral development of preterm infant during NICU hospitalization. Parents learned about preterm infants' cues and behavioral state when they expressed their signals. In addition, parent learned the appropriate strategies to respond to their preterm infants' cues while interacting with them. Furthermore, parents learned and practiced providing developmental care for their preterm infants through 6 practices of neuroprotective care including 1) healing environment, 2) positioning & handling, 3) safeguarding sleep, 4) minimizing stress and pain, 5) protecting skin, and 6) optimizing nutrition. These six care practices in

neuroprotective interventions promoted the stability of the infant's autonomic, sensory, motoric, and state regulation, and directly benefited the improvement of neurobehavioral development of preterm infants (Altimier & Philip, 2013; 2016). In addition, the CPIDC program encouraged fathers to learn about the provision of care for their infants alongside with their wives. Additionally, this program had the "Preemie Developmental Care" handbook, which facilitated staff nurses' organization of activities and intervention processes to promote neurobehavioral development of preterm infants. Therefore, the NICU nursing staff followed the said guidelines that covered six care practices, for example, the regulation of sound and light in the NICU involved the measurement of sound and light levels to avoid disturbing the infant's sleep. The infant's sleep and awakening times was also recorded so that nursing could be performed without disturbing the infant more than necessary.

The constant interplay of stimuli in the NICU affected an infant's still-developing brain and sensory systems when he or she was born prematurely. It was critical that background neurosensory stimulation be kept at a level that allowed sensory systems to discriminate and accommodate meaningful signals or stimulations. This was especially true for touch, position, sound, light, and comfort, which were all part of early neurosensory development, whether in utero or in the NICU (Graven, 2006). High-risk infants depended on the NICU to maintain their physiological functions. They were also vulnerable to all of stressors associated with fetal development occurring outside of the womb. Individualized neuroprotective care could be provided to each infant by NICU caregivers and parents. Collaboration with families and the restoration of parent–infant attachment benefits both infants and their parents. Due to the stressful nature of working in an intensive care setting, it was critical to "care for the caregiver" by providing NICU staff with the support they required (Altimier & Philip, 2016). Therefore, it demonstrated that the CPIDC program was effective in enhancing neurobehavioral development of preterm infants.

These findings were congruent with previous findings of a systematic review and meta-analysis, which discovered that the NIDCAP intervention was effective in improving neurobehavioral and neurological development of preterm

infants at two weeks corrected age when compared to standard care (Aita et al., 2021). This was similar to the findings of the Maternal Participation Program (MPP), which found that the neurobehavioral development score of preterm infants on days 14 and 28 after birth whose mothers received MPP was higher than that of those receiving usual nursing care (Namprom et al., 2018). They concluded that the experimental group's increased neurobehavioral development scores might be caused by the multisensory input of six care practices of Altimier and Phillips' (2013) IDC model. They used this model as their framework. This was also consistent with other findings, which showed that the program's emphasis on early parental participation in child-parent dyad-focused services such as environmental modulation, feeding support, massage, dyadic interaction activities, child developmental skills, parental support and education, and transition home preparation had a short-term benefit in enhancing neurophysiological maturation in preterm infants with VLBW during the neonatal period. In addition, some early EEG/ERP parameters were found to be linked to the infants' neonatal neurobehavioral function (Yu et al., 2019). In addition, this was in line with the findings of a previous study indicating that, in comparison to preterm infants treated in from low-quality developmental care units, those in high-quality infant-centered care NICUs where more developmental care was provided had better neurobehavioral development at discharge with higher attention and regulation, less excitability and hypotonicity, and lower stress/abstinence than (Montirosso et al., 2012).

However, the findings of this study contradicted the findings of a previous meta-analysis study, which found that parental participation failed to significantly improve neurobehavioral development of preterm infants during NICU hospitalization (Aita et al., 2021). It could be due to differences in the components of interventions as well as the gestational age of the preterm infants studied in these studies. Furthermore, these findings were also inconsistent with those of Chen et al. (2013) whose study compared between the low birth weight and preterm Taiwanese infants receiving child and parent-focused developmental care and the control group. They found no significant differences in total score, tone and motor patterns, reflexes, or behavioral responses on the Neonatal Neurobehavioral Examination-Chinese version (NNE-C). It could be due to different contexts of participants,

which led to an unequal number of infants in the experimental (120 cases) and control (58 cases) groups.

Preterm infant growth

Preterm infant growth is a clinical outcome related to long-term neurodevelopment as well as overall health outcomes. For the findings of this study, preterm infants who received the CPIDC on the 14th and the 28th days from birth had no significantly higher mean scores in preterm infant weight gain, weight gain velocity, and growth velocity than those receiving usual care. These results were congruent with other study (Heo & Oh, 2019), which found no significant difference in infants' weight between preterm infants treated with a parental participation improvement program and those who received usual care. In addition, the results were similar to the previous study (Namprom et al., 2018), which revealed that after implementing a maternal participation program for a preterm infant's mother, there was no effect on weight gain, weight gain velocity, and growth velocity on day 14 and 28 after birth, weight gain velocity. A study reported the same results that no statistically significant infant body weight was found in preterm infants who were a part of maternal participation in an infant care education program (Jang & Ju, 2020). Furthermore, these findings were consistent with the study that had no effect on infant weights within the first 2-3 weeks after implementing a multi-stage training program for preterm infants' mothers (Beheshtipoor et al., 2013).

Preterm infants with an immature physiological status are more likely to experience growth retardation because they are placed in a different environment than their mothers' womb. They may have problems with growth and development because their gestational age is shorter and their birth weight is smaller (Claas, 2011). Preterm infants' growth is influenced by a variety of factors, including gestational age, birth weight, nutrition while hospitalized, disease severity, and growth status prior to discharge (Pediatrics EboCjo, 2016). The gestational age, regular health care, caregivers' educational background, mothers' daily contact with the baby, monthly average family income, the addition of a breast milk supplement, and daily milk volume were risk factors for preterm infants' catch-up growth after discharge (Liu et al., 2019). It is possible to conclude that a variety of factors

influence the growth of preterm infants. As a result, the current findings can be explained as follows.

The following are some probable causes for why there was no difference in weight gain, weight gain velocity, and growth velocity between the experimental and control groups in the first two weeks of preterm infants' lives. The first reason is that preterm infants' weight gain during the first two postnatal weeks may have been influenced by physiological weight loss. In preterm and low birth weight neonates, initial physiological weight loss of roughly 7–15% of birth weight is common in the first seven days of life. From roughly the 10^{th} to the 21^{st} day of life, recovery occurs with a rise in body weight (Namiiro et al., 2012; Riddle et al., 2006). Moreover, preterm infants born at week 29 or with more gestational age regain their initial weight loss two weeks after birth but most preterm infants require even longer, three weeks or more, depending on their degree of immaturity (Cole et al., 2013). The loss of extracellular water causes most infants to lose weight after birth, which is considered physiological (Fenton et al., 2013). In this study of preterm infants with a gestational age of 28–32 weeks, it was revealed that in the first two weeks or 14^{th} day after birth, six infants (three each in experimental and control groups) had either a negative weight loss or weight loss. They had the same weigh as when they were born. When the weight gain in the first two weeks was compared, it was discovered that the experimental group had a mean weight gain of 111.52 grams, which was likely similar to the control group's mean weight gain of 101.52 grams. The mean weight gain velocity in the experimental group was 7.97 g/day, which was similar to the control group, and the mean weight gain velocity was 7.25 g/day. As a result, there was no statistically significant difference in infant weight gain between the experimental and control groups on day 14 from birth. This was supported by the physiological weight loss theory.

Secondly, nutrition plays a role in preterm infant growth. Nutritional factors such as enteral feeding and parenteral nutrition practices can pose a significant risk for postnatal growth failure (PGF). Infants born prematurely or with intrauterine growth retardation (IUGR) have poor growth outcomes. The small for gestational age (SGA) has the greatest influence on both weight and head circumference growth restrictions (Lima et al., 2014). Furthermore, data from the

National Institute of Child and Human Development's (NICHD) neonatal research network revealed that 16% of preterm infants with very low birth weight were small for gestational age (SGA) at birth, but 89% of this same population of preterm infants had postnatal growth failure by the time they reached 36 weeks of corrected age (Dusick et al., 2003). In this study, infants in both groups were born at a gestational age of 28–32 weeks, with a postconceptional age of 32–36 weeks on the 28th day. Based on the characteristics of preterm infants in this study, only 4.35 percent of preterm infants in the control group were born SGA, whereas 17.39 percent of preterm infants in the experimental group were born SGA, which was higher than in the control group. Therefore, it might be the reason that supported these research findings.

Thirdly, the hospital's policy and protocol of nutrition management in NICU are to encourage breast-feeding as well as proper nutrition and fluid management for each preterm infant, and to encourage parents to visit their infant while being in the NICU. Preterm infants should be given all of the macro and micronutrients they need to grow normally in utero. To reduce the side effects of parenteral nutrition, enteral feeding should begin within the first day of life, preferably with supplemented mother's own breast milk (Wiechers et al., 2021). In this study, all infants in the experimental and control groups were fed the same combination of TPN, lipids, and breast milk, which started within the first few days after birth. Moreover, because the hospital promoted breastfeeding and breast milk for hospitalized preterm infants. Both groups received the same amount of nutrition care. Therefore, this could be the reason supporting these research findings.

Despite the fact that the mean weight gain of infants in the experimental group was not statistically significantly, it was higher than that of those in the control group. There was an upward trend in weight gain over time. Moreover, the simple effect of group at each time point (between-subjects) revealed that the weight gain scores between the experimental and control groups was a statistically significant different at 28th day from 14th day, indicating that follow-up weight in the long term might show significant differences in weight gain between the experimental and control groups. Furthermore, in terms of weight gain velocity and growth velocity on the 28th day from the 14th day, preterm infants who received the

comprehensive preterm infant developmental care program had significantly higher mean scores than those receiving the usual care. As a result, the CPIDC program might have contributed to the experimental group's significant weight gain after two weeks. The findings of this study were consistent with the previous one, which discovered that, after implementing a maternal participation program for the mother of a preterm infant, there was a statistically significant higher mean score of weight gain velocity and growth velocity on the 28th day from the 14th day compared to the control group (Namprom et al., 2018). According to the findings of O'Brien et al. (2013), the rate of change in weight gain of preterm infants on day 21 after birth was significantly higher in the Family Integrated Care program when compared to control infants. This was similar to a study by White-Traut et al. (2015), which revealed that preterm infants assigned to the hospital to home transition (H-HOPE) with premature infant's optimized environment intervention gained weight more rapidly over time than infants in the control group at the 20th and 28th day.

Furthermore, preterm infants who received the CPIDC had significantly higher mean scores of preterm infant length gain than those treated with the usual care at the 14th and 28th day from birth (T1 and T3). In addition, preterm infant receiving the CPIDC program had significantly higher mean scores of preterm infant head circumference gain than those who received the usual care at the 28th day from birth (T3). Moreover, the preterm infants who received the CPIDC program, only at the 28th day from birth (T3) had significantly higher mean scores of preterm infant length and head circumference gains than those at the 28th day from the 14th day (T2) and at 14th day from birth (T1). From the graph of the interaction plot, the mean scores of length and head circumference gains of the experimental and control groups were a trend toward increasing over time. During the first year following delivery, the head circumference requires specific monitoring. At birth, the head circumference is about 34 cm, slightly larger than the chest circumference, and by age four, it has grown to nearly 90% of the adult circumference. Despite the fact that head circumference may not indicate growth as well as weight, it is critical in the detection of disorders such as microcephaly and hydrocephalus. Inadequate or excessive growth of the head circumference suggests a future risk of poor cognitive development (Brandt et al., 2003; Sammallahti et al., 2014; Weisglas-Kuperus et al., 2009).

These findings were consistent with a study of the effects of early-stage neurodevelopmental treatment on the growth of preterm infants in the neonatal intensive care unit. It revealed that head circumference of the preterm infant in the intervention group who received the neurodevelopmental treatment was significantly improved compared to the preterm infant in the control group (Lee & Lee, 2018). This was similar to the other study, which discovered that preterm infants assigned to H-HOPE intervention grew in length more rapidly than infants in the attention control group, especially during the latter part of the hospital stay (White-Traut et al., 2015). Moreover, the previous studied found that height and head circumference increased over time in both experimental and control groups. As a result, the CPIDC program may have contributed to the experimental group's significant head circumference and length gains in a first two weeks (Jang & Ju, 2020).

The findings in this study could be explained as follow. The CPIDC program encouraged parents to visit their preterm infants in the hospital and participate in their infant care. Moreover, this program provided educational training by demonstration and return-demonstration strategies which were performed on one-by-one coaching between the researcher and parents in a private room or by the bedside. It included six practices of neuroprotective care. Furthermore, the CPIDC program foster fathers' engagement in providing care for their infants alongside their wives. In addition, this program was carried out in collaboration with staff nurses to organize activities to improve infants' growth by following the guidelines of six care practices of individualized developmental care. The six care practices could promote an infant's growth by reducing energy expenditure, increasing growth hormones, and optimizing nutrition through breast feeding. Gentle touch, kangaroo care, the odor of fresh breast milk, colostrum mouth care, eye-to-eye contact, and other practices could all help to reduce energy expenditure. Flex position, quiet sleep, and infant massage greatly enhance growth hormones. These practices provide emotional, tactile, proprioceptive, vestibular, auditory, visual, and thermal stimulation. Breastfeeding or nipple sucking and kangaroo care provided multisensory (emotional, tactile, proprioceptive, vestibular, olfactory, auditory, visual, and thermal) stimulation (Cong et al., 2009; Ramachandran & Dutta, 2013) as well as promote quiet sleep state and more stable

physiological status (Chiu & Anderson, 2009). Therefore, it demonstrated that the CPIDC program is effective in enhancing preterm infant's growth.

Parental self-efficacy

The findings of this study explained that parental self-efficacy scores of parents who received the CPIDC program had significantly higher mean scores of parental self-efficacy than those receiving the usual care at post-intervention (at 14th day from birth: T2) and follow-up (at 28th day from birth: T3). Moreover, the mean scores of parental self-efficacy of the parents in both groups significantly increased over time but, in comparison to those receiving the usual care, parents in the CPIDC program had an instant increase of parental self-efficacy. These findings supported the hypotheses 5 and 6 which confirmed the useful effectiveness of the CPIDC program. The program has been developed based on the synactive theory (Als, 1982), the NIDC model (Altimier & Phillips, 2013; 2016), related synthesized research evidences (Benzies et al., 2013; Brecht et al., 2012; Brett et al., 2011; Burke, 2018; Puthussery et al., 2018; Vanderveen et al., 2009) and contexts from perspective of Thai parents. The enhancement of parental self-efficacy scores in the experimental group might be based on educational support and psychosocial support. This was consistent with Bandura's self-efficacy (1997), which stated that performance accomplishments and verbal persuasion are the key tenets of self-efficacy. It is critical for parents to have the skills they need to succeed while also making them realize they are successful in order to develop self-efficacy. Furthermore, the use of coaching and creative feedback techniques during performance, as well as the evaluation of individual emotional states during infant care practice. The researcher provided educational training by means of demonstration and return-demonstration strategies to perform one-by-one coaching between the researcher and parent. Moreover, the researcher also planned and set the time schedule for parents to provide care for their preterm infant and to reduce their stress. Parents were asked to reflect and evaluate activities.

The explanation of findings in this study was described as follow. The CPIDC program started with trusting relationship building and goal setting for first time parents. This step initiates relationship between the researcher and parents to build mutual trust so that parents became relax and open-minded. Mutual trust

between researcher and parent started with a positive mindset to gather proper data by asking right questions and demonstrating thoughtful and unexpected acts of kindness reflecting the importance of relationship (Kowalski & Casper, 2007). This was in line with the findings of Phuma-Ngaiyaye and Kalembo (2016). They argued that friendly nurses who were supportive of their demands provided an environment favorable to maternal–newborn bonding. According to the mothers, meeting friendly nurses and midwives in the NICU made them feel accepted and recognized as mothers. Their confidence in infant care grows as a result of these feelings. Then, the researcher provided information about the NICU environment and policy, explained the important role of parents to their infant while being hospitalized, and encouraged parents to set reality-oriented goals about parent participation in preterm infant developmental care. Moreover, the researcher gave a contact (LINE Application) to parents so that they could ask questions and share their experiences.

The second step was the effort to understand the context of the parents and preterm infants. The researcher encouraged parents to express their feelings about the situation of their preterm infants so that parents could receive certain aids and gain the understanding of their feelings, perceptions and knowledge related to preterm infant cues. Their participation in preterm infant care allowed them to understand their behaviors during the course of involvement in preterm infant care and their problems in this situation. The researcher listened carefully and expressed empathies with a nonjudgmental attitude towards parental beliefs and experiences in order to understand situations on the basis of parents' perception, knowledge, and ability to participate in preterm infant care during hospitalization. The researcher encouraged them to identify and assess their individual needs of engagement in preterm infant care during hospitalization too. The parental confidence can be boosted by supporting parents in understanding their preterm infant's behaviors (Larocque et al., 2015).

The third step was coaching parents to develop their self-efficacy in preterm infant care. The researcher provided educational trainings by means of demonstration and return-demonstration strategies, which included one-by-one coaching between the researcher and parents in a private room or by the bedside. They could perform activities directly with their preterm infants. According to the previous study, mothers who participated in the family-integrated care program stated that daily educational

sessions and bedside teaching were extremely beneficial and relaxing (Bracht et al., 2013). This strategy promoted a seamless transition to individual-guided bedside practice such as reading the infant's behavioral cues and exhibiting developmentally appropriate care. Moreover, the researcher gave a handbook to parents to guide and support them in providing care for preterm infants. This handbook provided parents with opportunity to review their knowledge whenever they needed it. The beneficial educational effect, according to a previous study, was due to the provision of more opportunity to mothers so that they could apply what they learned and gave relevant feedbacks or responses after a face-to-face session via booklets and PowerPoint slides (Jang & Ju, 2020).

The fourth step promoted and supported therapeutic infant development. The researcher encouraged parents to visit their preterm infants in the hospital and participate in their care. Supporting and empowering mothers to attain their role enhanced their abilities and confidence resulting in less mother-infant separation. This would eventually facilitate bonding and development (Flacking et al., 2012).

The fifth step was to provide parents with psychosocial support. The researcher stayed by their bedsides to assist them if they lacked confidence in their caring abilities or had difficulty performing caring activities. The researcher repeated trainings and facilitated participations in implementing caring practices in order to assisted them in terms of caring practices. Practice specific infant-care actions consistently thus enabled them to gain confidence (Jang & Ju, 2020). The researcher also provided them with emotional support, positive feedback, one-to-one support through LINE Application, and telephone counseling depending on their availability of communication devices. When the mother expressed her confident in providing care for her infant, this step provided her a positive reinforcement.

Reflection and evaluation were the final steps. Parents were invited to reflect on the program's activities that they had participated in. Finally, the researcher explained the program, presented the commendation, and thanked the participants for their participation. The mothers acquired confidence with increased ability to provide care for their preterm infants after participating in the CPIDC program. Furthermore, they were pleased with the program.

In addition, fathers engaged in every session of the CPIDC program, and the results of Phase I were from their perspectives. Fathers expressed their needs for information and education on how to provide care for their infants alongside their wives. One of the social supports that may reduce mother stress, which impacts parental self-efficacy, is family support. Social support is a predictor of maternal parental self-efficacy (Shorey et al., 2014). Disappointment, stress, and depression are all risks for parents with low self-efficacy (Sanders & Woolley, 2005). Moreover, low parental self-efficacy is also related to a low level of social support and poor health status (Shea, 1984). Finally, it demonstrates that the CPIDC program is effective in enhancing parental self-efficacy.

These findings were consistent with the findings of a study on educational intervention on preterm infants' behavior for the promotion of parental confidence. It revealed that parental educational program could help parents increase their knowledge of preterm infant behavior and better understand their preterm infants (Larocque et al., 2015). This was consistent with the findings of a study that examined the effects of an infant care education program for mothers of late-preterm infants on parenting confidence, breastfeeding rates, and infant growth and readmission rates. It discovered that mothers of late-preterm infants who received the late-preterm infant care education program had significantly higher parenting confidence scores over time than those who did not (Jang & Ju, 2020). Furthermore, systematic reviews and meta-analyses found that universal parental education interventions significantly increased parental self-efficacy among first-time parents, and these effects were sustained over time (Liyana Amin et al., 2018). The duration of interventions had an impact on the amount of increase in parental self-efficacy. Parents' views of their abilities to provide care for and positively nurture their children's growth and development were defined as parental self-efficacy (Paul et al., 2018). Consequently, parental self-efficacy was critical for parents to succeed in their roles (Vance & Brandon, 2017). The more elevated level of parental self-efficacy was, the more confident they were in their actions. This relationship demonstrated the inductive and not-harsh punitive discipline rehearses, for parental participation and observation, and for responsiveness and warmth toward infants, children, and youths

(Jones & Prinz, 2005; Wittkowski et al., 2017). Furthermore, parents were more likely to offer their infant with a healthy and supportive environment.

Preterm infants pay less attention, are less receptive to parent–infant interactions, and have fewer pleasant and more negative emotions than full-term infants. As a result, parents of preterm infants may have a harder time gaining a sense of mastery and may be at risk of losing self-efficacy in connection to parenting tasks, particularly throughout infancy (Pennell et al., 2012; Seashore et al., 1973). Parents report a lack of knowledge and abilities in observing and interpreting specific behaviors of preterm infants, and how to interact with their preterm infants. All these contribute to greater stress and lower self-efficacy (Baker & McGrath, 2011; Kenner & Lott, 1990). Therefore, preterm infant parents require educational and emotional support (Raines & Brustad, 2012; Larocque et al., 2015).

However, the findings of this study contradicted a study of the effects of the parental sensitivity intervention on parents of preterm infants. According to the latter, despite the fact that mothers of preterm infants received the parental sensitivity intervention, no significant differences in maternal self-efficacy between the experimental and control groups were found (Phianching et al., 2020). It might be because the intervention in this study was implemented in a short period of time.

Strengths and limitations

Three key elements should be acknowledged as the strengths of this study. To begin, the CPIDC program was developed based on the scientific knowledge (theory and research evidence), as well as participants' needs, beliefs, competency, and context (parental perspectives). The CPIDC program was effective for increasing preterm infant neurobehavioral development and increased parental self-efficacy (maternal self-efficacy) until the 28th postnatal day. Furthermore, because it was aligned with parents' needs, beliefs, competencies, and contexts, the CPIDC program could enhance preterm infant neurobehavioral development and increase parental self-efficacy (maternal self-efficacy) over time up to the 28th postnatal day. Moreover, the CPIDC program was effective for increasing preterm infant growth.

Secondly, this study is a comprehensive program in collaboration with nurses and parents to promote the growth and neurobehavioral development of

preterm infants during hospitalization. The researcher requested cooperation from nurses and provided them with a manual and guideline to enhance the growth and neurobehavioral development of preterm infants while in the NICU, where nurses were close to and provided care for preterm infants. Additionally, in this study, both parents participated in the intervention and were educated about infant care according to their needs, as shown in Phase I.

Finally, to evaluate the effectiveness of the CPIDC program, this study used a randomized control trial (RCT) or a true experimental design. This was the strongest intervention study design for determining cause-and-effect relationships. The three essential elements of a true experiment were used in this study including an intervention or treatment, a comparison or control group for the prevention of maturation threat, and random assignment of participants to an experimental or control group for the prevention of history and selection threat (Gray et al., 2017). In this study, the research assistant who collected the data and participants was blind in this study. To minimize bias, the allocation was kept hidden from the enrolled research assistant and participants. The study group was masked from the research assistant and had no access to the data or information regarding group assignment.

There were two limitations of the study. Firstly, the threat of data contamination due to some cases of participants in both groups visiting preterm infants at the same time. Although the researchers used the CPIDC program to isolate the mothers of the experimental groups in separate rooms, communication between the two groups was possible. Furthermore, because the wards are connected and have shared rooms where these techniques can be seen and applied, the NICU ward nurse in the control group may converse with the NICU ward nurse in the experimental group.

Secondly, in this study, both the father and mother participated in the program at all sessions in order to achieve these results (enhanced preterm infant growth and neurobehavioral development and increased parental self-efficacy). Therefore, those who will implement this program need to be careful about measuring the outcomes because the outcomes may differ in the real situation.

Suggestions and recommendations

The findings of this study provided evidence to guide nurses to enhance preterm infant neurobehavioral development, preterm infant growth, and parental self-efficacy. It was found that establishing knowledge, confidence, and abilities of parents to provide care for their preterm infants was an effective way to promote parental participation in preterm infant care with their families.

Implication for nursing practice

The CPIDC program, which should be implemented in hospitals, can enhance preterm infant growth and neurobehavioral development as well as increase parental self-efficacy, while its effects can be maintained until the 28th postnatal day. Nurses can apply the CPIDC program to parents so that they were able to provide care for their preterm infants and sick newborn unit the early stages after preterm infant birth. It will benefit both parents and preterm infants to develop better parental interaction and reduce parental stress, which will benefit parental confidence as well as constant growth and neurobehavioral development of preterm infants. The CPIDC program had six stages in four sessions of one week, and was started on day 1 or 2 and continued to day 3, 5, and 7. The necessary components and features for implementing CPIDC program were as follows.

1. Fathers were significant persons in assisting mothers in setting goals and plans to participate in providing care for their preterm infants while in the hospital. According to the findings of this study, fathers expressed their needs of information and education on how to provide care for their infants alongside their wives; therefore, nurses should provide them with such information in order to encourage them to engage in preterm infant care with their wives. Furthermore, they were the first persons to visit their infants in the NICU while their wives dealt with physical limitations of caesarean section or normal delivery. In addition, they prepared all of the preterm infant care necessities while being at the hospital such as bringing food and beverages to their wives or breast milk to their infant. On top of that, they also handled all hospital-related documents of their wives and preterm infants. Moreover, when parents provided care for preterm infants together, they would give each other advice on what could be their best way to create a bond with their infants. They played parental roles in assisting self-development and enhancing family relationships.

2. The first stage was critical for opening the minds of mothers and their families. Nurses should be able to express their feelings honestly, respectfully, friendly and compassionately to create mutual trust between researcher and parents. This will make them relax and open-minded to the researcher. Furthermore, nurses should maintain emotional expression throughout the CPIDC program. Techniques for rapid building of trust with parents included remembering their names and the names of their infant.

3. Nurses should use a combination of closed- and open-ended questions in stage 2 to help parents understand the situation of preterm birth within the context of Thai culture. Nurses would find that if only open-ended questions were asked, parents would be unable to respond. It was difficult for parents to answer questions because all of them had no experience or were unaware of the situation they were in.

4. At stage 3, 4, and 5 in this study, nurses should use demonstration and return-demonstration strategies combined with one-by-one coaching in educating and training parents on how to provide developmental care for preterm infants. This would promote their confidence and more involvement in providing care for their infant while being hospitalized in the NICU, thereby fostering parent-infant interactions. Furthermore, the nurse should act as a psychosocial supporter for parents because each of them has different needs so the personalized information and emotional support should be provided for them. Additionally, preterm infant care provided 24 hours a day by nurses, making them an important person in supporting the infant's growth and neurobehavioral development. As a result, nurses must follow guidelines to promote infant development and growth such as reducing light and noise that can disrupt the infant's sleep.

While preterm infants are hospitalized, it is critical to promote their growth and neurobehavioral development, as well as parental self-efficacy. Therefore, the effectiveness of this program will be benefits in the terms of primary nurses who provide a holistic care of infants during hospitalization.

From the research findings related to the NICU's environmental arrangement, parent education in preterm infant developmental care (infant cue), and parent participation in preterm infant care, it was found that its effectiveness to promote preterm infant growth and neurobehavioral development as well as enhance parental self-efficacy. However, in real situations, the first primary outcome of

nursing care in the NICU is the safe life of the infant. There is still a lack of nursing care related to promoting preterm infant growth and neurobehavioral development.. As a result, at the policy level, policy makers should consider adding these research findings (which provide evidence to guide nurses to enhance preterm infant neurobehavioral development, preterm infant growth, and parental self-efficacy) in preterm infant care guidelines to enhance the quality of preterm infant nursing care.

Implication for nursing education

Nurse instructors should apply or integrate the findings of this study into nursing innovations such as making a nest suitable for the size of the infant by procuring new materials to replace the cloth roll that was originally used in NICU wards to promote preterm infant growth and neurobehavioral development and increase parental self-efficacy in preterm infant care. Furthermore, nurse instructors should apply the NICU nursing practice instructions to promote preterm infant growth and neurobehavioral development and increase parental self-efficacy in preterm infant care when teaching both theory and practice so that nursing students can gain a more insightful understanding of this issue.

Based on the findings of this study, nursing institutions should use this intervention (CPIDC program) to guide their training for nurses who care for preterm infants and parents in NICU wards to promote preterm infant growth and neurobehavioral development and increase parental self-efficacy in caring for their infants, such as adding this program as part of its training in special nursing courses in neonatal and pediatric critical care.

Implication for nursing research

Further research should be conducted to measure outcomes in terms of preterm infant's growth and neurobehavioral development in the long term should be observed in order to examine the sustainable effects of the CPIDC program. In addition, more research should be carried out with other age groups of preterm infants such as extremely preterm infants or late preterm infants and with other maternal groups, namely, adolescent mothers in order to examine effects of the CPIDC program on growth and neurobehavioral development of those infants. It should be add more perspective of nurse and other health care provider for the tailor the most suitable program to promote preterm infant growth and neurobehavioral development as well as

parental self-efficacy. Furthermore, future research should examine the CPIDC program in other settings either in Thailand or in other countries to ensure its cross-culture generalization.

Conclusion

The CPIDC program is an appropriate early nursing intervention for parents who have preterm infants because it can enhance preterm infant growth and neurobehavioral development as well as maternal self-efficacy in their preterm care during hospitalization. Additionally, the findings will confirm the findings of the experiment with the CPIDC program, which is an effective approach to change parental feelings and perceptions of preterm infant care while being hospitalized in the NICU. As a result, this study contributes to the understanding of how to promote preterm infant growth and neurobehavioral development during NICU hospitalization through nurse-parent collaboration. Furthermore, the important finding is that fathers are the important people who can assist mothers and preterm infants in overcoming problems they are currently facing. Encouraging fathers to be involved in infant care benefits outcomes of both mothers and infants, increases fathers' role, and strengthens family relationships. Therefore, this study has a significant finding, as it confirms that the best intervention should be developed based on not only theory or research evidence but also parental perspectives in terms of needs, beliefs, and competencies. This will be an appropriate and effective mean for setting goals according to the real situation so that changing outcomes can be achieved.

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APPENDICES

APPENDIX A

The ethical approval documents

เลขที่ IRB3-009/2564

เอกสารรับรองผลการพิจารณาจริยธรรมการวิจัยในมนุษย์
มหาวิทยาลัยบูรพา

คณะกรรมการพิจารณาจริยธรรมการวิจัยในมนุษย์ มหาวิทยาลัยบูรพา ได้พิจารณาโครงการวิจัย

รหัสโครงการวิจัย : G-HS 102/2563
โครงการวิจัยเรื่อง : ประสิทธิผลของโปรแกรมการดูแลพัฒนาการของทารกคลอดก่อนกำหนดแบบเบ็ดเสร็จต่อการรับรู้สมรรถนะในตนเองของผู้ปกครอง การเจริญเติบโตและพัฒนาการด้านประสาทพฤติกรรมของทารกคลอดก่อนกำหนดขณะรักษาตัวในโรงพยาบาล
หัวหน้าโครงการวิจัย : นางสาววารุณี มีหลาย
หน่วยงานที่สังกัด : นิสิตระดับบัณฑิตศึกษา คณะพยาบาลศาสตร์

คณะกรรมการพิจารณาจริยธรรมการวิจัยในมนุษย์ มหาวิทยาลัยบูรพา ได้พิจารณาแล้วเห็นว่า โครงการวิจัยดังกล่าวเป็นไปตามหลักการของจริยธรรมการวิจัยในมนุษย์ โดยที่ผู้วิจัยเคารพสิทธิและศักดิ์ศรีในความเป็นมนุษย์ ไม่มีการล่วงละเมิดสิทธิ สวัสดิภาพ และไม่ก่อให้เกิดภยันตรายแก่ตัวอย่างการวิจัยและผู้เข้าร่วมโครงการวิจัย

จึงเห็นสมควรให้ดำเนินการวิจัยในขอบข่ายของโครงการวิจัยที่เสนอได้ (ดูตามเอกสารตรวจสอบ)

1. แบบเสนอเพื่อขอรับการพิจารณาจริยธรรมการวิจัยในมนุษย์	ฉบับที่ 2 วันที่ 25 เดือน มกราคม พ.ศ. 2564
2. เอกสารโครงการวิจัยฉบับภาษาไทย	ฉบับที่ 2 วันที่ 25 เดือน มกราคม พ.ศ. 2564
3. เอกสารชี้แจงผู้เข้าร่วมโครงการวิจัย	ฉบับที่ 1 วันที่ 17 เดือน ธันวาคม พ.ศ. 2563
4. เอกสารแสดงความยินยอมของผู้เข้าร่วมโครงการวิจัย	ฉบับที่ 1 วันที่ 17 เดือน ธันวาคม พ.ศ. 2563
5. เอกสารแสดงรายละเอียดเครื่องมือที่ใช้ในการวิจัย	ฉบับที่ 1 วันที่ 17 เดือน ธันวาคม พ.ศ. 2563
6. เอกสารอื่นๆ (ถ้ามี)	ฉบับที่ - วันที่ - เดือน - พ.ศ. -

วันที่รับรอง : วันที่ 12 เดือน กุมภาพันธ์ พ.ศ. 2564
วันที่หมดอายุ : วันที่ 12 เดือน กุมภาพันธ์ พ.ศ. 2565

ลงนาม

(ผู้ช่วยศาสตราจารย์ แพทย์หญิงรมร แย้มประทุม)
ประธานคณะกรรมการพิจารณาจริยธรรมการวิจัยในมนุษย์ มหาวิทยาลัยบูรพา
สำหรับโครงการวิจัย ระดับบัณฑิตศึกษา และระดับปริญญาตรี
ชุดที่ 3 (กลุ่มคลินิก/ วิทยาศาสตร์สุขภาพ/ วิทยาศาสตร์และเทคโนโลยี)

เอกสารเลขที่ ๖๖ / ๒๕๖๔ รหัสวิจัย ๑๕๐/๖๓/O/q

ใบรับรองโครงการวิจัย
โดย คณะกรรมการวิจัยและจริยธรรมการวิจัย โรงพยาบาลชลบุรี

.....

โครงการวิจัย : ประสิทธิผลของโปรแกรมการดูแลพัฒนาการของทารกคลอดก่อนกำหนดแบบเบ็ดเสร็จต่อการรับรู้สมรรถนะในตนเองของผู้ปกครอง การเจริญเติบโตและพัฒนาการด้านประสาทพฤติกรรมของทารกคลอดก่อนกำหนดขณะรักษาตัวในโรงพยาบาล
(Effectiveness of Comprehensive Preterm Infant Developmental Care Program on Parental Self-Efficacy, Growth and Neurobehavioral Development of Hospitalized Preterm Infants)

ผู้ดำเนินการวิจัยหลัก : นางสาววารุณี มีหลาย

หน่วยงานที่รับผิดชอบ : คณะพยาบาลศาสตร์ มหาวิทยาลัยบูรพา

คณะกรรมการวิจัยและจริยธรรมการวิจัย โรงพยาบาลชลบุรี ได้พิจารณาแล้วเห็นว่าสมควรให้ดำเนินการวิจัยในขอบข่ายของโครงการวิจัยที่เสนอได้

ลงนาม **ลงนาม**

(แพทย์หญิงวรนาฎ รัตนากร)
ประธานคณะกรรมการจริยธรรมวิจัย
วันที่รับรอง : ๗ มีนาคม ๒๕๖๔

(แพทย์หญิงจิรวรรณ อารยะพงษ์)
ผู้อำนวยการโรงพยาบาลชลบุรี
วันหมดอายุ: ๗ มีนาคม ๒๕๖๕

เอกสารที่คณะกรรมการรับรอง
๑. โครงการวิจัย
๒. ข้อมูลสำหรับกลุ่มประชากรหรือผู้มีส่วนร่วมในการวิจัยและใบยินยอมของกลุ่มประชากรหรือผู้มีส่วนร่วมในการวิจัย
๓. ผู้วิจัย
๔. แบบสอบถาม
๕. ใบยินยอมเข้าร่วมงานวิจัยของอาสาสมัคร

กำหนดการส่งรายงานความคืบหน้าการวิจัย
☐ทุก ๓ เดือน ☐ทุก ๖ เดือน ☑๑ ปี

เงื่อนไข...

<u>เงื่อนไข</u>

๑. ข้าพเจ้ารับทราบว่า จะดำเนินการเก็บข้อมูลการวิจัยหลังได้รับอนุมัติจากคณะกรรมการวิจัยและจริยธรรมการวิจัย

๒. หากใบรับรองโครงการวิจัยหมดอายุการดำเนินการวิจัยต้องยุติ เมื่อต้องการต่ออายุต้องขออนุมัติใหม่ล่วงหน้าไม่ต่ำกว่า ๑ เดือน พร้อมส่งรายงานความก้าวหน้าการวิจัย

๓. ดำเนินการวิจัยตามที่ระบุไว้ในโครงการวิจัยอย่างเคร่งครัด

๔. ใช้เอกสารข้อมูลสำหรับกลุ่มประชากรหรือผู้มีส่วนร่วมในการวิจัย ใบยินยอมของกลุ่มประชากรหรือผู้มีส่วนร่วมในการวิจัยและเอกสารเชิญเข้าร่วมวิจัย (ถ้ามี) เฉพาะที่กรรมการลงนามรับรองเท่านั้น

๕. หากเกิดเหตุการณ์ไม่พึงประสงค์ร้ายแรงในสถานที่เก็บข้อมูลที่ขออนุมัติจากคณะกรรมการฯ ต้องรายงานคณะกรรมการวิจัยและจริยธรรมการวิจัย ใน ๗ วันทำการ

๖. หากมีการเปลี่ยนแปลงการดำเนินการวิจัย ให้ส่งคณะกรรมการวิจัยและจริยธรรมการวิจัยพิจารณารับรองก่อนดำเนินการต่อ

๗. ส่งรายงานความก้าวหน้าการวิจัยตามที่คณะกรรมการวิจัยและจริยธรรมการวิจัยกำหนด

APPENDIX B

Informed consent form

AF 06-02

เอกสารชี้แจงผู้เข้าร่วมโครงการวิจัย
(Participant Information Sheet)
(สำหรับบิดามารดาที่ให้สัมภาษณ์)

รหัสโครงการวิจัย : G-HS 102/2563

โครงการวิจัยเรื่อง : ประสิทธิผลของโปรแกรมการดูแลพัฒนาการของทารกคลอดก่อนกำหนดแบบเบ็ดเสร็จต่อการรับรู้สมรรถนะในตนเองของผู้ปกครอง การเจริญเติบโต และพัฒนาการด้านประสาทพฤติกรรมของทารกคลอดก่อนกำหนดขณะรักษาตัวในโรงพยาบาล

เรียน ผู้เข้าร่วมโครงการวิจัย

ข้าพเจ้า นางสาววารุณี มีหลาย นิสิตปริญญาเอก คณะพยาบาลศาสตร์ มหาวิทยาลัยบูรพา ขอเรียนเชิญท่านเข้าร่วมโครงการวิจัยเรื่อง "ประสิทธิผลของโปรแกรมการดูแลพัฒนาการของทารกคลอดก่อนกำหนดแบบเบ็ดเสร็จต่อการรับรู้สมรรถนะในตนเองของผู้ปกครอง การเจริญเติบโต และพัฒนาการด้านประสาทพฤติกรรมของทารกคลอดก่อนกำหนดขณะรักษาตัวในโรงพยาบาล" ก่อนที่ท่านจะตกลงเข้าร่วมการวิจัย ขอเรียนให้ท่านทราบรายละเอียดของโครงการวิจัย ดังนี้

โครงการวิจัยนี้มีวัตถุประสงค์เพื่อพัฒนาและทดสอบประสิทธิผลของโปรแกรมการดูแลพัฒนาการของทารกคลอดก่อนกำหนดแบบเบ็ดเสร็จต่อการรับรู้สมรรถนะในตนเองของผู้ปกครอง การเจริญเติบโต และพัฒนาการด้านประสาทพฤติกรรมของทารกคลอดก่อนกำหนดขณะรักษาตัวในโรงพยาบาล โครงการวิจัยนี้ประกอบด้วย 2 ระยะ โดยระยะนี้เป็นระยะที่ 1 มีวัตุประสงค์เพื่อพัฒนาโปรแกรมการดูแลพัฒนาการของทารกคลอดก่อนกำหนดแบบเบ็ดเสร็จ

หากท่านตกลงที่จะเข้าร่วมการศึกษาวิจัยนี้ ข้าพเจ้าขอความร่วมมือท่านในการให้สัมภาษณ์และตอบแบบสอบถามข้อมูลส่วนบุคคล โดยผู้วิจัยจะดำเนินการสัมภาษณ์ในห้องที่เป็นส่วนตัวในหอผู้ป่วยทารกแรกเกิดวิฤตในช่วงเวลาที่นัดหมายตามความสะดวกของท่าน โดยใช้เวลาสัมภาษณ์ประมาณ 45-60 นาที ทั้งนี้หากข้อมูลยังไม่ครบถ้วนผู้วิจัยอาจจะนัดหมายท่านเพื่อให้สัมภาษณ์เพิ่มเติมอีกครั้ง

การเข้าร่วมการศึกษาวิจัยนี้เป็นไปโดยสมัครใจ ท่านมีสิทธิปฏิเสธที่จะเข้าร่วมหรือถอนตัวจากโครงการวิจัยนี้ได้ทุกเมื่อ การปฏิเสธหรือถอนตัวของท่านจะไม่มีผลกระทบต่อสิทธิประการใด ๆ ที่ท่านและทารกในการปกครองของท่านพึงจะได้รับ ทั้งนี้ท่านจะได้ค่าชดเชยการเสียเวลาหรือค่าใช้จ่ายในการเดินทางจำนวน 200 บาทต่อครั้ง

ผลของการวิจัยนี้จะเป็นประโยชน์ในการพัฒนาโปรแกรมการดูแลพัฒนาการของทารกคลอดก่อนกำหนดขณะรักษาตัวในโรงพยาบาล เพื่อส่งเสริมให้ทารกคลอดก่อนกำหนดมีพัฒนาการด้านประสาทพฤติกรรม และการเจริญเติบโตของทารกเกิดก่อนกำหนดที่ดี รวมทั้งส่งเสริมสมรรถนะในตนเองของบิดาหรือมารดาในการดูแลทารกคลอดก่อนกำหนดต่อไป โดยข้อมูลต่าง ๆ ของท่านจะถูกเก็บเป็นความลับ และจะไม่มีการเปิดเผยชื่อของท่านการนำเสนอข้อมูลจะเป็นในภาพรวม ทั้งนี้ข้อมูลจะถูกเก็บไว้ในคอมพิวเตอร์ที่มีรหัสผ่านของผู้วิจัยเท่านั้น ส่วน

เอกสารจะถูกเก็บไว้ในตู้เอกสารที่ใส่กุญแจไว้เป็นเวลา 1 ปีหลังจากการเผยแพร่ผลการวิจัย และจะถูกทำลายหลังจากนั้น

หากท่านมีคำถามหรือข้อสงสัยประการใดสามารถติดต่อข้าพเจ้า นางสาววารุณี มีหลาย คณะพยาบาลศาสตร์ มหาวิทยาลัยบูรพา โทรศัพท์มือถือหมายเลข 086-5291539 ข้าพเจ้ายินดีตอบคำถามและข้อสงสัยของท่านทุกเมื่อ หรือติดต่อที่ รองศาสตราจารย์ ดร.จินตนา วัชรสินธุ์ อาจารย์ที่ปรึกษา โทรศัพท์มือถือหมายเลข 081-4019472 และถ้าผู้วิจัยไม่ปฏิบัติตามที่ได้ชี้แจงไว้ในเอกสารชี้แจงผู้เข้าร่วมโครงการวิจัยสามารถแจ้งมายังคณะกรรมการพิจารณาจริยธรรมการวิจัยในมนุษย์ มหาวิทยาลัยบูรพา กองบริหารการวิจัยและนวัตกรรม หมายเลขโทรศัพท์ 038-102620

เมื่อท่านพิจารณาแล้วเห็นสมควรเข้าร่วมโครงการวิจัยนี้ ขอความกรุณาลงนามในเอกสารแสดงความยินยอมเข้าร่วมโครงการวิจัยที่แนบมาด้วย และขอขอบพระคุณในความร่วมมือของท่านมา ณ ที่นี้

AF 06-02

เอกสารชี้แจงผู้เข้าร่วมโครงการวิจัย
(Participant Information Sheet)
(สำหรับกลุ่มควบคุม)

รหัสโครงการวิจัย : G-HS 102/2563

โครงการวิจัยเรื่อง : ประสิทธิผลของโปรแกรมการดูแลพัฒนาการของทารกคลอดก่อนกำหนดแบบเบ็ดเสร็จต่อการรับรู้สมรรถนะในตนเองของผู้ปกครอง การเจริญเติบโต และพัฒนาการด้านประสาทพฤติกรรมของทารกคลอดก่อนกำหนดขณะรักษาตัวในโรงพยาบาล

เรียน ผู้เข้าร่วมโครงการวิจัย

ข้าพเจ้า นางสาววารุณี มีหลาย นิสิตปริญญาเอก คณะพยาบาลศาสตร์ มหาวิทยาลัยบูรพา ขอเรียนเชิญท่านและทารกในการปกครองของท่านเข้าร่วมโครงการวิจัยเรื่อง “ประสิทธิผลของโปรแกรมการดูแลพัฒนาการของทารกคลอดก่อนกำหนดแบบเบ็ดเสร็จต่อการรับรู้สมรรถนะในตนเองของผู้ปกครอง การเจริญเติบโต และพัฒนาการด้านประสาทพฤติกรรมของทารกคลอดก่อนกำหนดขณะรักษาตัวในโรงพยาบาล” ก่อนที่ท่านจะตกลงเข้าร่วมการวิจัย ขอเรียนให้ท่านทราบรายละเอียดของโครงการวิจัย ดังนี้

โครงการวิจัยนี้มีวัตถุประสงค์เพื่อพัฒนาและทดสอบประสิทธิผลของประสิทธิผลของโปรแกรมการดูแลพัฒนาการของทารกคลอดก่อนกำหนดแบบเบ็ดเสร็จต่อการรับรู้สมรรถนะในตนเองของผู้ปกครอง การเจริญเติบโต และพัฒนาการด้านประสาทพฤติกรรมของทารกคลอดก่อนกำหนดขณะรักษาตัวในโรงพยาบาล โครงการวิจัยนี้ประกอบด้วย 2 ระยะ โดยระยะนี้เป็นระยะที่ 2 มีวัตถุประสงค์เพื่อทดสอบประสิทธิผลของโปรแกรมการดูแลพัฒนาการของทารกคลอดก่อนกำหนดแบบเบ็ดเสร็จต่อการรับรู้สมรรถนะในตนเองของผู้ปกครอง การเจริญเติบโต และพัฒนาการด้านประสาทพฤติกรรมของทารกคลอดก่อนกำหนดขณะรักษาตัวในโรงพยาบาล

หากท่านตกลงที่จะเข้าร่วมโครงการวิจัย ข้าพเจ้าขอความร่วมมือท่านในการตอบแบบสอบถามข้อมูลส่วนบุคคล และแบบสอบถามการรับรู้สมรรถนะแห่งตนในการเลี้ยงดูทารกของมารดา จำนวน 3 ครั้ง คือ ครั้งที่ 1 (ครั้งแรกที่พบผู้วิจัย) ครั้งที่ 2 หลังเสร็จสิ้นกิจกรรม (วันที่ 14) และครั้งสุดท้าย (วันที่ 28) ใช้เวลาในการตอบแบบสอบถามประมาณ 10-15 นาที สำหรับทารกในความปกครองของท่านจะได้รับการประเมินการเจริญเติบโตและพัฒนาการด้านประสาทพฤติกรรมโดยผู้ช่วยวิจัย จำนวน 3 ครั้ง คือ ครั้งที่ 1 (ครั้งแรกที่พบผู้วิจัย) ครั้งที่ 2 หลังเสร็จสิ้นกิจกรรม (วันที่ 14) และครั้งสุดท้าย (วันที่ 28)

ผลการวิจัยนี้จะเป็นประโยชน์ต่อภาพรวมในการใช้เป็นแนวทางในการส่งเสริมการเจริญเติบโต และพัฒนาของทารกคลอดก่อนกำหนดรายอื่น ๆ ขณะรักษาตัวในโรงพยาบาลต่อไป รวมทั้งส่งเสริมให้บิดามารดาของทารกคลอดก่อนกำหนดรายอื่น ๆ มีสมรรถนะในตนเองในการดูแลทารกคลอดก่อนกำหนด โดยข้อมูลต่าง ๆ ของท่านและทารกในความปกครองของท่านจะถูกเก็บเป็นความลับ และใช้รหัสตัวเลขแทนการระบุชื่อ การนำเสนอข้อมูลจะเป็นในภาพรวม ทั้งนี้ข้อมูลจะถูกเก็บไว้ในคอมพิวเตอร์ที่มีรหัสผ่านของผู้วิจัยเท่านั้น ส่วนเอกสารจะถูกเก็บไว้ในตู้เอกสารที่ใส่กุญแจไว้เป็นเวลา 1 ปีหลังจากการเผยแพร่ผลการวิจัยและจะถูกทำลายหลังจากนั้น

การเข้าร่วมการศึกษาวิจัยนี้เป็นไปโดยสมัครใจ ท่านมีสิทธิปฏิเสธที่จะเข้าร่วมหรือถอนตัวจากโครงการวิจัยนี้ได้ทุกเมื่อ โดยการปฏิเสธหรือถอนตัวของท่านจะไม่มีผลกระทบต่อสิทธิประการใด ๆ ที่ท่านและทารกในการปกครองของท่านพึงจะได้รับ ทั้งนี้ท่านจะได้รับค่าชดเชยการเสียเวลาหรือค่าใช้จ่ายในการค่าเดินทาง จากการเข้าร่วมการศึกษาวิจัยนี้ในกรณีที่ผู้วิจัยนัดหมายท่านมาเข้าร่วมโครงการวิจัยในวันที่ท่านไม่ได้กำหนดไว้เป็นวันเยี่ยมบุตร จำนวน 2 ครั้ง ครั้งละ 200 บาท

หากท่านมีคำถามหรือข้อสงสัยประการใดสามารถติดต่อข้าพเจ้า นางสาววารุณี มีหลาย คณะพยาบาลศาสตร์ มหาวิทยาลัยบูรพา โทรศัพท์มือถือหมายเลข 086-5291539 ข้าพเจ้ายินดีตอบคำถามและข้อสงสัยของท่านทุกเมื่อ หรือติดต่อที่ รองศาสตราจารย์ ดร.จินตนา วัชรสินธุ์ อาจารย์ที่ปรึกษา โทรศัพท์มือถือหมายเลข 081-4019472 และถ้าผู้วิจัยไม่ปฏิบัติตามที่ได้ชี้แจงไว้ในเอกสารชี้แจง ผู้เข้าร่วมโครงการวิจัยสามารถแจ้งมายังคณะกรรมการพิจารณาจริยธรรมการวิจัยในมนุษย์ มหาวิทยาลัยบูรพา กองบริหารการวิจัยและนวัตกรรม หมายเลขโทรศัพท์ 038-102620

เมื่อท่านพิจารณาแล้วเห็นสมควรเข้าร่วมโครงการวิจัยนี้ ขอความกรุณาลงนามในเอกสารแสดงความยินยอมที่แนบมาด้วย และขอขอบพระคุณในความร่วมมือของท่านมา ณ ที่นี้

AF 06-02

เอกสารชี้แจงผู้เข้าร่วมโครงการวิจัย
(Participant Information Sheet)
(สำหรับกลุ่มทดลอง)

รหัสโครงการวิจัย : G-HS 102/2563

โครงการวิจัยเรื่อง : ประสิทธิผลของโปรแกรมการดูแลพัฒนาการของทารกคลอดก่อนกำหนดแบบเบ็ดเสร็จต่อการรับรู้สมรรถนะในตนเองของผู้ปกครอง การเจริญเติบโต และพัฒนาการด้านประสาทพฤติกรรมของทารกคลอดก่อนกำหนดขณะรักษาตัวในโรงพยาบาล

เรียน ผู้เข้าร่วมโครงการวิจัย

ข้าพเจ้า นางสาววารุณี มีหลาย นิสิตปริญญาเอก คณะพยาบาลศาสตร์ มหาวิทยาลัยบูรพา ขอเรียนเชิญท่านและทารกในการปกครองของท่านเข้าร่วมโครงการวิจัยเรื่อง "ประสิทธิผลของโปรแกรมการดูแลพัฒนาการของทารกคลอดก่อนกำหนดแบบเบ็ดเสร็จต่อการรับรู้สมรรถนะในตนเองของผู้ปกครอง การเจริญเติบโต และพัฒนาการด้านประสาทพฤติกรรมของทารกคลอดก่อนกำหนดขณะรักษาตัวในโรงพยาบาล" ก่อนที่ท่านจะตกลงเข้าร่วมการวิจัย ขอเรียนให้ท่านทราบรายละเอียดของโครงการวิจัย ดังนี้

โครงการนี้มีวัตถุประสงค์เพื่อพัฒนาและทดสอบประสิทธิผลของโปรแกรมการดูแลพัฒนาการของทารกคลอดก่อนกำหนดแบบเบ็ดเสร็จต่อการรับรู้สมรรถนะในตนเองของผู้ปกครอง การเจริญเติบโต และพัฒนาการด้านประสาทพฤติกรรมของทารกคลอดก่อนกำหนดขณะรักษาตัวในโรงพยาบาล โครงการวิจัยนี้ประกอบด้วย 2 ระยะ โดยระยะนี้เป็นระยะที่ 2 มีวัตถุประสงค์เพื่อทดสอบประสิทธิผลของโปรแกรมการดูแลพัฒนาการของทารกคลอดก่อนกำหนดแบบเบ็ดเสร็จต่อการรับรู้สมรรถนะในตนเองของผู้ปกครอง การเจริญเติบโต และพัฒนาการด้านประสาทพฤติกรรมของทารกคลอดก่อนกำหนดขณะรักษาตัวในโรงพยาบาล

หากท่านตกลงที่จะเข้าร่วมโครงการวิจัยนี้ ข้าพเจ้าขอความร่วมมือท่านร่วมกิจกรรมของโครงการวิจัย โดยการตอบแบบสอบถามข้อมูลส่วนบุคคล และแบบสอบถามการรับรู้สมรรถนะแห่งตนในการเลี้ยงดูทารกของมารดา จำนวน 3 ครั้ง คือ ครั้งที่ 1 (ครั้งแรกที่พบผู้วิจัย) ครั้งที่ 2 หลังเสร็จสิ้นกิจกรรม (วันที่ 14) และครั้งสุดท้าย (วันที่ 28) แบบสอบถาม ใช้เวลาในการตอบแบบสอบถามประมาณ 10 - 15 นาที สำหรับทารกในความปกครองของท่านจะได้รับการประเมินการเจริญเติบโต และพัฒนาการด้านประสาทพฤติกรรมโดยผู้ช่วยวิจัย จำนวน 3 ครั้ง คือ ครั้งที่ 1 (ครั้งแรกที่พบผู้วิจัย) ครั้งที่ 2 หลังเสร็จสิ้นกิจกรรม (วันที่ 14) และครั้งสุดท้าย (วันที่ 28) นอกจากนี้ผู้วิจัยจะขอให้ท่านและทารกในความปกครองของท่านเข้าร่วมกิจกรรมที่ผู้วิจัยกำหนดขึ้น จำนวน 4 ครั้ง ภายใน 1 สัปดาห์ โดยแต่ละครั้งใช้เวลาประมาณ 60 – 90 นาที ในห้องที่เป็นส่วนตัวและที่เตียงทารกในหอผู้ป่วยทารกแรกเกิดวิกฤต

ผลของการวิจัยนี้จะเป็นประโยชน์ต่อตัวท่านและทารกในความปกครองของท่าน โดยทารกในความปกครองของท่านจะได้รับการส่งเสริมให้มีพัฒนาการด้านประสาทพฤติกรรมและการเจริญเติบโตที่ดี และสำหรับตัวท่านจะได้รับส่งเสริมให้มีสมรรถนะในการดูแลทารกในความปกครองของท่านต่อไป นอกจากนี้ผลการวิจัยนี้ยังเป็นประโยชน์ต่อภาพรวมในการใช้เป็นแนวทางในการส่งเสริมการเจริญเติบโตและพัฒนาของทารกคลอดก่อน

กำหนดรายอื่น ๆ ขณะรักษาตัวในโรงพยาบาลต่อไป โดยข้อมูลต่าง ๆ ของท่านและทารกในความปกครองของท่านจะถูกเก็บเป็นความลับ และใช้รหัสตัวเลขแทนการระบุชื่อ การนำเสนอข้อมูลจะเป็นในภาพรวม ทั้งนี้ข้อมูลจะถูกเก็บไว้ในคอมพิวเตอร์ที่มีรหัสผ่านของผู้วิจัยเท่านั้น ส่วนเอกสารจะถูกเก็บไว้ในตู้เอกสารที่ใส่กุญแจไว้เป็นเวลา 1 ปีหลังจากการเผยแพร่ผลการวิจัยและจะถูกทำลายหลังจากนั้น

การเข้าร่วมการศึกษาวิจัยนี้เป็นไปโดยสมัครใจ ท่านมีสิทธิปฏิเสธที่จะเข้าร่วมหรือถอนตัวจากโครงการวิจัยนี้ได้ทุกเมื่อ โดยการปฏิเสธหรือถอนตัวของท่านจะไม่มีผลกระทบต่อสิทธิประการใด ๆ ที่ท่านและทารกในการปกครองของท่านพึงจะได้รับ ทั้งนี้ท่านจะได้รับค่าชดเชยการเสียเวลาหรือค่าใช้จ่ายในการเดินทางจากการเข้าร่วมการศึกษาวิจัยนี้ในกรณีที่ผู้วิจัยนัดหมายท่านมาเข้าร่วมโครงการวิจัยในวันที่ท่านไม่ได้กำหนดไว้เป็นวันเยี่ยมบุตร จำนวน 2 ครั้ง ครั้งละ 200 บาท

หากท่านมีคำถามหรือข้อสงสัยประการใดสามารถติดต่อข้าพเจ้า นางสาววารุณี มีหลาย คณะพยาบาลศาสตร์ มหาวิทยาลัยบูรพา โทรศัพท์มือถือหมายเลข 086-5291539 ข้าพเจ้ายินดีตอบคำถามและข้อสงสัยของท่านทุกเมื่อ หรือติดต่อที่ รองศาสตราจารย์ ดร.จินตนา วัชรสินธุ์ อาจารย์ที่ปรึกษา โทรศัพท์มือถือหมายเลข 081-4019472 และถ้าผู้วิจัยไม่ปฏิบัติตามที่ได้ชี้แจงไว้ในเอกสารชี้แจง ผู้เข้าร่วมโครงการวิจัยสามารถแจ้งมายังคณะกรรมการพิจารณาจริยธรรมการวิจัยในมนุษย์ มหาวิทยาลัยบูรพา กองบริหารการวิจัยและนวัตกรรม หมายเลขโทรศัพท์ 038-102620

เมื่อท่านพิจารณาแล้วเห็นสมควรเข้าร่วมโครงการวิจัยนี้ ขอความกรุณาลงนามในเอกสารแสดงความยินยอมที่แนบมาด้วย และขอขอบพระคุณในความร่วมมือของท่านมา ณ ที่นี้

AF 06-03.1

เอกสารแสดงความยินยอม
ของผู้เข้าร่วมโครงการวิจัย (Consent Form)

รหัสโครงการวิจัย : G-HS 109/2563

โครงการวิจัยเรื่อง: ประสิทธิผลของโปรแกรมการดูแลพัฒนาการของทารกคลอดก่อนกำหนดแบบเบ็ดเสร็จต่อการรับรู้สมรรถนะในตนเองของผู้ปกครอง การเจริญเติบโต และพัฒนาการด้านประสาทพฤติกรรมของทารกคลอดก่อนกำหนดขณะรักษาตัวในโรงพยาบาล

ให้คำยินยอม วันที่ ..... เดือน ..... พ.ศ. .....

ก่อนที่จะลงนามในเอกสารแสดงความยินยอมของผู้เข้าร่วมโครงการวิจัยนี้ ข้าพเจ้าได้รับการอธิบายถึงวัตถุประสงค์ของโครงการวิจัย วิธีการวิจัย และรายละเอียดต่างๆ ตามที่ระบุในเอกสารข้อมูลสำหรับผู้เข้าร่วมโครงการวิจัย ซึ่งผู้วิจัยได้ให้ไว้แก่ข้าพเจ้า และข้าพเจ้าเข้าใจคำอธิบายดังกล่าวครบถ้วนเป็นอย่างดีแล้ว และผู้วิจัยรับรองว่าจะตอบคำถามต่างๆ ที่ข้าพเจ้าสงสัยเกี่ยวกับการวิจัยนี้ด้วยความเต็มใจ และไม่ปิดบังซ่อนเร้นจนข้าพเจ้าพอใจ

ข้าพเจ้าเข้าร่วมโครงการวิจัยนี้ด้วยความสมัครใจ และมีสิทธิที่จะบอกเลิกการเข้าร่วมโครงการวิจัยนี้เมื่อใดก็ได้ การบอกเลิกการเข้าร่วมการวิจัยนั้นไม่มีผลกระทบใด ๆ ที่ข้าพเจ้าจะพึงได้รับต่อไป

ผู้วิจัยรับรองว่าจะเก็บข้อมูลเกี่ยวกับตัวข้าพเจ้าเป็นความลับ จะเปิดเผยได้เฉพาะในส่วนที่เป็นสรุปผลการวิจัย การเปิดเผยข้อมูลของข้าพเจ้าต่อหน่วยงานต่างๆ ที่เกี่ยวข้องต้องได้รับอนุญาตจากข้าพเจ้า

ข้าพเจ้าได้อ่านข้อความข้างต้นแล้วมีความเข้าใจดีทุกประการ และได้ลงนามในเอกสารแสดงความยินยอมนี้ด้วยความเต็มใจ

ลงนาม .....ผู้ยินยอม
(.....)
ลงนาม .....พยาน
(.....)

AF 06-03.4

เอกสารแสดงความยินยอม
ของผู้เข้าร่วมโครงการวิจัย (Consent Form)
(สำหรับผู้ที่มีอายุต่ำกว่า 7 ปี หรือผู้ไม่สามารถตัดสินใจได้ด้วยตนเอง)

รหัสโครงการวิจัย : G-HS 102/2563

โครงการวิจัยเรื่อง : ประสิทธิผลของโปรแกรมการดูแลพัฒนาการของทารกคลอดก่อนกำหนดแบบเบ็ดเสร็จต่อการรับรู้สมรรถนะในตนเองของผู้ปกครอง การเจริญเติบโต และพัฒนาการด้านประสาทพฤติกรรมของทารกคลอดก่อนกำหนดขณะรักษาตัวในโรงพยาบาล

ให้คำยินยอม วันที่ ..... เดือน ..... พ.ศ. .....

ข้าพเจ้า ..... บิดามารดา/ผู้ปกครอง/ผู้อนุบาล ของ ..... ซึ่งเป็นผู้เข้าร่วมโครงการวิจัย ได้รับการอธิบายถึงวัตถุประสงค์ของโครงการวิจัย วิธีการวิจัย และรายละเอียดต่างๆ ตามที่ระบุในเอกสารข้อมูลสำหรับผู้เข้าร่วมโครงการวิจัย ซึ่งผู้วิจัยได้ให้ไว้แก่ข้าพเจ้า และข้าพเจ้าเข้าใจคำอธิบายดังกล่าวครบถ้วนเป็นอย่างดีแล้ว และผู้วิจัยรับรองว่าจะตอบคำถามต่างๆ ที่ข้าพเจ้าสงสัยเกี่ยวกับการวิจัยนี้ด้วยความเต็มใจ และไม่ปิดบังซ่อนเร้นจนข้าพเจ้าพอใจ

ข้าพเจ้าจึงยินยอมให้ ..... เข้าร่วมโครงการวิจัยนี้ด้วยความสมัครใจ และมีสิทธิที่จะบอกเลิกการเข้าร่วมโครงการวิจัยนี้เมื่อใดก็ได้ การบอกเลิกการเข้าร่วมการวิจัยนั้นไม่มีผลกระทบใด ๆ ที่ผู้เข้าร่วมโครงการวิจัยจะพึงได้รับต่อไป

ผู้วิจัยรับรองว่าจะเก็บข้อมูลเกี่ยวกับผู้เข้าร่วมโครงการวิจัยเป็นความลับ จะเปิดเผยได้เฉพาะในรูปที่เป็นสรุปผลการวิจัย การเปิดเผยข้อมูลของผู้เข้าร่วมโครงการวิจัยต่อหน่วยงานต่างๆ ที่เกี่ยวข้องต้องได้รับอนุญาตจากข้าพเจ้า

ข้าพเจ้าได้อ่านข้อความข้างต้นแล้ว และมีความเข้าใจดีทุกประการ จึงได้ลงนามในเอกสารแสดงความยินยอมนี้ด้วยความเต็มใจ

ลงนาม .....
(.....)
บิดา/มารดา/ผู้ปกครอง/ผู้อนุบาล

ลงนาม .....พยาน
(.....)

AF 06-03.1

เอกสารแสดงความยินยอม
ของผู้เข้าร่วมโครงการวิจัย (Consent Form)
(สำหรับผู้ปกครอง)

รหัสโครงการวิจัย : G-HS 102/2563

โครงการวิจัยเรื่อง: ประสิทธิผลของโปรแกรมการดูแลพัฒนาการของทารกคลอดก่อนกำหนดแบบเบ็ดเสร็จต่อการรับรู้สมรรถนะในตนเองของผู้ปกครอง การเจริญเติบโต และพัฒนาการด้านประสาทพฤติกรรมของทารกคลอดก่อนกำหนดขณะรักษาตัวในโรงพยาบาล

ให้คำยินยอม วันที่ ..... เดือน ..... พ.ศ. .....

ก่อนที่จะลงนามในเอกสารแสดงความยินยอมของผู้เข้าร่วมโครงการวิจัยนี้ ข้าพเจ้าได้รับการอธิบายถึงวัตถุประสงค์ของโครงการวิจัย วิธีการวิจัย และรายละเอียดต่างๆ ตามที่ระบุในเอกสารข้อมูลสำหรับผู้เข้าร่วมโครงการวิจัย ซึ่งผู้วิจัยได้ให้ไว้แก่ข้าพเจ้า และข้าพเจ้าเข้าใจคำอธิบายดังกล่าวครบถ้วนเป็นอย่างดีแล้ว และผู้วิจัยรับรองว่าจะตอบคำถามต่างๆ ที่ข้าพเจ้าสงสัยเกี่ยวกับการวิจัยนี้ด้วยความเต็มใจ และไม่ปิดบังซ่อนเร้นจนข้าพเจ้าพอใจ

ข้าพเจ้าเข้าร่วมโครงการวิจัยนี้ด้วยความสมัครใจ และมีสิทธิที่จะบอกเลิกการเข้าร่วมโครงการวิจัยนี้เมื่อใดก็ได้ การบอกเลิกการเข้าร่วมการวิจัยนั้นไม่มีผลกระทบใด ๆ ที่ข้าพเจ้าจะพึงได้รับต่อไป

ผู้วิจัยรับรองว่าจะเก็บข้อมูลเกี่ยวกับตัวข้าพเจ้าเป็นความลับ จะเปิดเผยได้เฉพาะในส่วนที่เป็นสรุปผลการวิจัย การเปิดเผยข้อมูลของข้าพเจ้าต่อหน่วยงานต่างๆ ที่เกี่ยวข้องต้องได้รับอนุญาตจากข้าพเจ้า

ข้าพเจ้าได้อ่านข้อความข้างต้นแล้วมีความเข้าใจดีทุกประการ และได้ลงนามในเอกสารแสดงความยินยอมนี้ด้วยความเต็มใจ

ลงนาม .....ผู้ยินยอม
(.....)

ลงนาม .....พยาน
(.....)

BUU-IRB Approved
12 ก.พ. 2564

วจ 16 (ใหม่)

โรงพยาบาลชลบุรี CHONBURI HOSPITAL	ศูนย์ส่งเสริมการวิจัย โรงพยาบาลชลบุรี Chonburi Hospital Research Center
เอกสารชี้แจงข้อมูลแก่ผู้เข้าร่วมโครงการวิจัย (สำหรับบิดามารดาที่ให้สัมภาษณ์) (Research Subject Information sheet)	

1. ชื่อโครงการวิจัย ประสิทธิผลของโปรแกรมการดูแลพัฒนาการของทารกคลอดก่อนกำหนดแบบเบ็ดเสร็จต่อการรับรู้สมรรถนะในตนเองของผู้ปกครอง การเจริญเติบโตและพัฒนาการด้านประสาทพฤติกรรมของทารกคลอดก่อนกำหนดขณะรักษาตัวในโรงพยาบาล

วันที่ชี้แจง

ชื่อและสถานที่ทำงานของผู้วิจัย นางสาววารุณี มีหลาย นิสิตปริญญาเอก หลักสูตรปรัชญาดุษฎีบัณฑิต สาขาวิชาพยาบาลศาสตร์ (หลักสูตรนานาชาติ) คณะพยาบาลศาสตร์ มหาวิทยาลัยบูรพา

ผู้ให้ทุนวิจัย

ท่านได้รับการเชิญชวนให้เข้าร่วมในโครงการวิจัยนี้ แต่ก่อนที่ท่านจะตกลงใจเข้าร่วมหรือไม่ โปรดอ่านข้อความในเอกสารนี้ทั้งหมด เพื่อให้ทราบว่า เหตุใดท่านจึงได้รับเชิญให้เข้าร่วมในโครงการวิจัยนี้ โครงการวิจัยนี้ทำเพื่ออะไร หากท่านเข้าร่วมโครงการวิจัยนี้ท่านจะต้องทำอะไรบ้าง รวมทั้งข้อดีและข้อเสียที่อาจจะเกิดขึ้นในระหว่างการวิจัย

ในเอกสารนี้ อาจมีข้อความที่ท่านอ่านแล้วยังไม่เข้าใจ โปรดสอบถามผู้วิจัยหรือผู้ช่วยผู้วิจัยที่ทำโครงการนี้เพื่อให้อธิบายจนกว่าท่านจะเข้าใจ ท่านจะได้รับเอกสารนี้ 1 ชุด กลับไปอ่านที่บ้านเพื่อปรึกษาหารือกับญาติพี่น้อง เพื่อนหรือแพทย์ที่ท่านรู้จัก ให้ช่วยตัดสินใจว่าควรจะเข้าร่วมโครงการวิจัยนี้หรือไม่ การเข้าร่วมในโครงการวิจัยครั้งนี้จะต้องเป็น**ความสมัครใจ**ของท่าน ไม่มีการบังคับหรือชักจูง **ถึงแม้ท่านจะไม่เข้าร่วมในโครงการวิจัย ท่านก็จะได้รับการรักษาพยาบาลตามปกติ การไม่เข้าร่วมหรือถอนตัวจากโครงการวิจัยนี้ จะไม่มีผลกระทบต่อการได้รับบริการการรักษาพยาบาลหรือผลประโยชน์ที่พึงจะได้รับของท่านแต่อย่างใด**

โปรดอย่าลงลายมือชื่อของท่านในเอกสารนี้จนกว่าท่านจะแน่ใจว่ามีความประสงค์จะเข้าร่วมในโครงการวิจัยนี้ คำว่า "ท่าน" ในเอกสารนี้ หมายถึงผู้เข้าร่วมโครงการวิจัยในฐานะเป็นอาสาสมัครในโครงการวิจัยนี้ หากท่านเป็น**ผู้แทนโดยชอบธรรม**ของผู้ที่จะเข้าร่วมในโครงการวิจัย และลงนามแทนในเอกสารนี้ โปรดเข้าใจว่า "ท่าน" ในเอกสารนี้หมายถึงผู้เข้าร่วมในโครงการวิจัยเท่านั้น

วัตถุประสงค์ของโครงการวิจัยนี้คืออะไร

โครงการวิจัยนี้มีวัตถุประสงค์เพื่อพัฒนาและทดสอบประสิทธิผลของโปรแกรมการดูแลพัฒนาการของทารกคลอดก่อนกำหนดแบบเบ็ดเสร็จต่อการรับรู้สมรรถนะในตนเองของผู้ปกครอง การเจริญเติบโต และพัฒนาการด้านประสาทพฤติกรรมของทารกคลอดก่อนกำหนดขณะรักษาตัวในโรงพยาบาล โครงการวิจัยนี้ประกอบด้วย 2 ระยะ โดยระยะนี้เป็นระยะที่ 1 มีวัตถุประสงค์เพื่อพัฒนาโปรแกรมการดูแลพัฒนาการของทารกคลอดก่อนกำหนดแบบเบ็ดเสร็จ

การรักษาที่จะให้และโอกาสที่อาสาสมัครจะได้รับการสุ่มเข้ากลุ่มศึกษา (ถ้ามี)

การเข้าร่วมโครงการวิจัยระยะนี้เป็นเพียงการสอบถามความคิดเห็นของท่านไม่มีการสุ่มให้เข้ากลุ่มการศึกษา

ขั้นตอนวิธีการดำเนินการวิจัยที่จะปฏิบัติต่อท่านเป็นอย่างไร

หากท่านตกลงที่จะเข้าร่วมการศึกษาวิจัยนี้ ข้าพเจ้านัดหมายท่านในช่วงเวลาตามความสะดวกของท่านเพื่อดำเนินการสัมภาษณ์เกี่ยวกับการมีส่วนร่วมในการส่งเสริมพัฒนาการของทารกคลอดก่อนกำหนดขณะรักษาตัวในโรงพยาบาล โดยจะดำเนินการสัมภาษณ์ในห้องที่เป็นส่วนตัวในหอผู้ป่วยทารกแรกเกิดวิกฤตใช้เวลาสัมภาษณ์ประมาณ 45-60 นาที ทั้งนี้หากข้อมูลยังไม่ครบถ้วนผู้วิจัยอาจจะนัดหมายท่านเพื่อให้สัมภาษณ์เพิ่มเติมอีกครั้ง

จะมีการทำโครงการวิจัยนี้ที่ใด และมีจำนวนผู้เข้าร่วมโครงการวิจัยทั้งสิ้นเท่าไร

ข้าพเจ้าวางแผนจะมีอาสาสมัครเข้าร่วมโครงการเป็นบิดามารดาอายุตั้งแต่แต่ 18 ปีขึ้นไป ที่มีบุตรมารับการรักษาที่หอผู้ป่วยทารกแรกเกิดวิกฤต โรงพยาบาลชลบุรี จำนวน 10 คน

ระยะเวลาที่ท่านจะต้องร่วมโครงการวิจัยและจำนวนครั้งที่นัด

ท่านจะร่วมอยู่ในโครงการวิจัยเป็นเวลา 1 สัปดาห์ โดยผู้วิจัยจะนัดหมายท่าน 1-2 ครั้ง

หน้าที่/ความรับผิดชอบของท่านต่อการเป็นอาสาสมัคร

เมื่อท่านตกลงที่จะเข้าร่วมการศึกษาวิจัยนี้ ข้าพเจ้าขอความร่วมมือท่านในการให้สัมภาษณ์และตอบแบบสอบถามข้อมูลส่วนบุคคล โดยผู้วิจัยจะดำเนินการสัมภาษณ์ในห้องที่เป็นส่วนตัวในหอผู้ป่วยทารกแรกเกิดวิกฤตในช่วงเวลาที่นัดหมายตามความสะดวกของท่าน โดยใช้เวลาสัมภาษณ์ประมาณ 45-60 นาที ทั้งนี้หากข้อมูลยังไม่ครบถ้วนผู้วิจัยอาจจะนัดหมายท่านเพื่อให้สัมภาษณ์เพิ่มเติมอีกครั้ง

ความไม่สุขสบาย หรือความเสี่ยงต่ออันตรายที่อาจจะได้รับจากกรรมวิธีการวิจัยมีอะไรบ้าง และวิธีการป้องกัน/แก้ไขที่ผู้วิจัยเตรียมไว้หากมีเหตุการณ์ดังกล่าวเกิดขึ้น

โครงการวิจัยระยะนี้ไม่มีความเสี่ยง

ประโยชน์ที่คาดว่าท่านจะได้รับจากโครงการวิจัย

ผลของการวิจัยนี้จะเป็นประโยชน์ในการพัฒนาโปรแกรมการดูแลพัฒนาการของทารกคลอดก่อนกำหนดขณะรักษาตัวในโรงพยาบาล เพื่อส่งเสริมให้ทารกคลอดก่อนกำหนดมีพัฒนาการด้านประสาทพฤติกรรม และการเจริญเติบโตของทารกเกิดก่อนกำหนดที่ดี รวมทั้งส่งเสริมสมรรถนะในตนเองของบิดาหรือมารดาในการดูแลทารกคลอดก่อนกำหนดต่อไป

หากท่านไม่เข้าร่วมโครงการวิจัยนี้ ท่านมีทางเลือกอื่นอย่างไรบ้าง

หากท่านไม่ได้เข้าร่วมโครงการวิจัยนี้ ท่านและทารกในความปกครองของท่านยังคงได้รับการดูแลตามปกติตามมาตรฐานการดูแลของทางโรงพยาบาล

ค่าใช้จ่ายที่ผู้เข้าร่วมในโครงการวิจัยจะต้องรับผิดชอบ (ถ้ามี)

เนื่องจากโครงการวิจัยนี้ดำเนินการในช่วงที่บุตรของท่านรับการรักษาอยู่ในโรงพยาบาลจึงไม่มีค่าใช้จ่ายใด ๆ เพิ่มเติมที่เกี่ยวข้องกับการดำเนินการ

ค่าเดินทาง หรืออื่น ๆ ที่จะได้รับเมื่อเข้าร่วมโครงการวิจัย (ถ้ามี)

ท่านจะได้ค่าชดเชยการเสียเวลาหรือค่าใช้จ่ายในการเดินทางจำนวน 200 บาท

ค่าชดเชยกรณีเกิดอันตรายที่เกี่ยวข้องกับโครงการวิจัยนี้เป็นอย่างไร

ในกรณีที่ท่านได้รับการบาดเจ็บจากการวิจัย ท่านจะได้รับการรักษาตามมาตรฐานการรักษาและตามสิทธิของท่าน โดยข้าพเจ้าจะให้ความช่วยเหลือประสานงานการให้การรักษาท่านอย่างเต็มที่

หากเกิดอันตรายที่เกี่ยวข้องกับโครงการวิจัยนี้ จะติดต่อกับใครและได้รับการปฏิบัติอย่างไร

หากเกิดอันตรายที่เกี่ยวข้องกับโครงการวิจัยนี้ สามารถติดต่อข้าพเจ้า นางสาววารุณี มีหลาย คณะพยาบาลศาสตร์ มหาวิทยาลัยบูรพา โทรศัพท์มือถือหมายเลข 086-5291539 ข้าพเจ้าจะให้ความช่วยเหลือประสานงานการให้การรักษาท่านอย่างเต็มที่ โดยท่านจะได้รับการรักษาตามมาตรฐานการรักษาและตามสิทธิของท่าน หรือติดต่อที่ รองศาสตราจารย์ ดร.จินตนา วัชรสินธุ์ อาจารย์ที่ปรึกษา โทรศัพท์มือถือหมายเลข 081-4019472

เหตุผลที่ท่านอาจถูกถอนจากการเป็นอาสาสมัครของโครงการวิจัยนี้

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หากท่านมีคำถามที่เกี่ยวข้องกับโครงการวิจัย จะถามใคร ระบุชื่อผู้วิจัยหรือผู้ร่วมวิจัย

หากท่านมีคำถามหรือข้อสงสัยประการใดสามารถติดต่อข้าพเจ้า นางสาววารุณี มีหลาย คณะพยาบาลศาสตร์ มหาวิทยาลัยบูรพา โทรศัพท์มือถือหมายเลข 086-5291539 ข้าพเจ้ายินดีตอบคำถามและข้อสงสัยของท่านทุกเมื่อ หรือติดต่อที่ รองศาสตราจารย์ ดร.จินตนา วัชรสินธุ์ อาจารย์ที่ปรึกษา โทรศัพท์มือถือหมายเลข 081-4019472

หากท่านรู้สึกว่าได้รับการปฏิบัติอย่างไม่เป็นธรรมในระหว่างโครงการวิจัยนี้ ท่านอาจแจ้งเรื่องได้ที่

ประธานคณะกรรมการวิจัยและจริยธรรมการวิจัย โรงพยาบาลชลบุรี โทร 0-38931047-8

ข้อมูลส่วนตัวของท่านที่ได้จากโครงการวิจัยครั้งนี้จะถูกนำไปใช้ดังต่อไปนี้

ข้อมูลต่าง ๆ ของท่านและทารกในความปกครองของท่านจะถูกเก็บเป็นความลับ และใช้รหัสตัวเลขแทนการระบุชื่อ การนำเสนอข้อมูลที่ได้จากโครงการวิจัย เพื่อประโยชน์ทางวิชาการจะเป็นในภาพรวม ทั้งนี้ข้อมูลจะถูกเก็บไว้ในคอมพิวเตอร์ที่มีรหัสผ่านของผู้วิจัยเท่านั้น ส่วนเอกสารจะถูกเก็บไว้ในตู้เอกสารที่ใส่กุญแจไว้เป็นเวลา 1 ปีหลังจากการเผยแพร่ผลการวิจัยและจะถูกทำลายหลังจากนั้น

ท่านจะถอนตัวออกจากโครงการวิจัยหลังจากได้ลงนามเข้าร่วมโครงการวิจัยแล้วได้หรือไม่

การเข้าร่วมการศึกษาวิจัยนี้เป็นไปโดยสมัครใจ ท่านมีสิทธิปฏิเสธที่จะเข้าร่วมหรือถอนตัวจากโครงการวิจัยนี้ได้ตลอดเวลา โดยการปฏิเสธหรือถอนตัวของท่านจะไม่มีผลกระทบต่อสิทธิประการใด ๆ ที่ท่านและทารกในการปกครองของท่านพึงจะได้รับ

หากมีข้อมูลใหม่ที่เกี่ยวข้องกับโครงการวิจัย ท่านจะได้รับแจ้งข้อมูลนั้นโดยผู้วิจัยหรือผู้วิจัยร่วมนั้นทันที (ในกรณีที่เป็นการวิจัยเกี่ยวข้องกับการรักษาโดยเฉพาะการใช้ยา)

การวิจัยนี้เป็นการวิจัยที่เกี่ยวข้องกับการพยาบาลที่เน้นการให้ความรู้และฝึกทักษะการดูแลทารกคลอดก่อนกำหนดไม่ได้เป็นการวิจัยเกี่ยวข้องกับการรักษาที่ใช้ยา

หมายเหตุ: 1. ผู้วิจัยควรมอบสำเนาแบบยินยอมอาสาสมัคร พร้อมแบบคำชี้แจงอาสาสมัคร อย่างละ 1 ชุด ให้อาสาสมัครหรือผู้ปกครองด้วย

2. เมื่อการวิจัยทางคลินิก (เพื่อการรักษาหรือไม่ก็ตาม) เกี่ยวข้องกับอาสาสมัครซึ่งต้องขอความยินยอมจากผู้แทนโดยชอบธรรม (เช่น ผู้เยาว์ หรือผู้ป่วยโรคสมองเสื่อมรุนแรง) อาสาสมัครควรได้รับการอธิบายเกี่ยวกับการวิจัยด้วยวิธีที่เหมาะสมที่อาสาสมัครนั้นจะเข้าใจได้ และถ้าทำได้อาสาสมัครควรลงนามและลงวันที่ในแบบยินยอมด้วยตนเอง

วจ 16 (ใหม่)

หนังสือแสดงเจตนายินยอมเข้าร่วมการวิจัย (Informed Consent)

ชื่อโครงการวิจัย: ประสิทธิผลของโปรแกรมการดูแลพัฒนาการของทารกคลอดก่อนกำหนดแบบเบ็ดเสร็จต่อการรับรู้สมรรถนะในตนเองของผู้ปกครอง การเจริญเติบโตและพัฒนาการด้านประสาทพฤติกรรมของทารกคลอดก่อนกำหนดขณะรักษาตัวในโรงพยาบาล

ข้าพเจ้า (นาย, นาง, นางสาว).....นามสกุล.....อายุ.....ปี

อยู่บ้านเลขที่.....หมู่ที่.....ตำบล.....อำเภอ.....จังหวัด.....

เป็นบิดา/มารดา/ผู้ปกครองของ (ด.ญ., ด.ช.).....อายุ.....ปี (ในกรณีที่อาสาสมัครเป็นเด็กอายุน้อยกว่า 18 ปี)

ได้รับฟังคำอธิบายจาก นางสาววารุณี มีหลาย

- ก่อนที่จะลงนามในใบยินยอมให้ทำการวิจัยนี้ ข้าพเจ้าได้รับการอธิบายจากผู้วิจัยถึงวัตถุประสงค์ของการวิจัย วิธีการวิจัย อันตราย หรืออาการที่อาจเกิดขึ้นจากการวิจัย หรือจากยาที่ใช้ รวมทั้งประโยชน์ที่คาดว่าจะเกิดขึ้นจากการวิจัยอย่างละเอียด และมีความเข้าใจดีแล้ว
- ผู้วิจัยรับรองว่าจะตอบคำถามที่ข้าพเจ้าสงสัยด้วยความเต็มใจ และไม่ปิดบังซ่อนเร้น จนข้าพเจ้าพอใจ
- ข้าพเจ้าเข้าร่วมในโครงการวิจัยนี้ด้วยความสมัครใจ โดยปราศจากการบังคับหรือชักจูง
- ข้าพเจ้ามีสิทธิที่จะบอกเลิกการเข้าร่วมในโครงการวิจัยเมื่อใดก็ได้ และการบอกเลิกนี้จะไม่มีผลต่อการรักษาพยาบาลที่ข้าพเจ้าจะพึงได้รับในปัจจุบันและในอนาคต
- ผู้วิจัยรับรองว่าจะเก็บข้อมูลเกี่ยวกับตัวข้าพเจ้าเป็นความลับ และจะเปิดเผยเฉพาะในรูปของสรุปผลการวิจัยโดยไม่มีการระบุชื่อนามสกุลของข้าพเจ้า การเปิดเผยข้อมูลเกี่ยวกับตัวข้าพเจ้าต่อหน่วยงานต่างๆ ที่เกี่ยวข้อง จะกระทำด้วยเหตุผลทางวิชาการเท่านั้น
- ผู้วิจัยรับรองว่าหากเกิดอันตรายใดๆ จากการวิจัย ข้าพเจ้าจะได้รับการรักษาพยาบาล ตามที่ระบุในเอกสารชี้แจงข้อมูลแก่ผู้เข้าร่วมโครงการวิจัย ข้าพเจ้าจะรายงานอาการข้างเคียงขึ้นให้แพทย์หรือเจ้าหน้าที่ที่กำลังปฏิบัติงานอยู่ในขณะนั้นทราบทันที
- ข้าพเจ้าจะได้รับเอกสารชี้แจงข้อมูลแก่ผู้เข้าร่วมโครงการวิจัย เก็บไว้ 1 ชุด

ข้าพเจ้าได้อ่านและเข้าใจคำอธิบายข้างต้นแล้ว จึงได้ลงนามยินยอมเป็นอาสาสมัครของโครงการวิจัยดังกล่าว

ลายมือชื่ออาสาสมัคร .....

(.....)

วัน/เดือน/ปี .....

ลายมือชื่อผู้ให้ข้อมูล .....

(.....)

วัน/เดือน/ปี .....

ลายมือชื่อผู้วิจัยหลัก .....

(.....)

วัน/เดือน/ปี .....

หมายเหตุ: (1) ในกรณีที่อาสาสมัครเป็นเด็กโตแต่อายุไม่ถึง 18 ปี สามารถตัดสินใจเองได้ ให้ลงลายมือชื่อทั้งอาสาสมัคร (เด็ก)และผู้ปกครองด้วย

(2) แพทย์ผู้รักษาต้องไม่เป็นผู้ขอความยินยอมอาสาสมัคร แต่สามารถให้ข้อมูล/คำอธิบายได้

(3) ในกรณีที่อาสาสมัครไม่สามารถอ่านหนังสือ/ลงลายมือชื่อ ได้ ให้ใช้การประทับลายมือแทนดังนี้:

ข้าพเจ้าไม่สามารถอ่านหนังสือได้ แต่ผู้วิจัยได้อ่านข้อความในแบบยินยอมนี้ให้แก่ข้าพเจ้าฟังจนเข้าใจดี ข้าพเจ้าจึงประทับตราลายนิ้วมือขวาของข้าพเจ้าในแบบยินยอมนี้ด้วยความเต็มใจ

ประทับลายนิ้วมือขวา

ลายมือชื่อผู้อธิบาย.....

(.....)

พยาน..... (พยานต้องไม่ใช่แพทย์หรือผู้วิจัย)

(.....)

วันที่.....เดือน.....พ.ศ.....

วจ 16 (ใหม่)

โรงพยาบาลชลบุรี CHONBURI HOSPITAL	ศูนย์ส่งเสริมการวิจัย โรงพยาบาลชลบุรี Chonburi Hospital Research Center

เอกสารชี้แจงข้อมูลแก่ผู้เข้าร่วมโครงการวิจัย (สำหรับบิดามารดาที่ให้สัมภาษณ์)
(Research Subject Information sheet)

1. ชื่อโครงการวิจัย ประสิทธิผลของโปรแกรมการดูแลพัฒนาการของทารกคลอดก่อนกำหนดแบบเบ็ดเสร็จต่อการรับรู้สมรรถนะในตนเองของผู้ปกครอง การเจริญเติบโตและพัฒนาการด้านประสาทพฤติกรรมของทารกคลอดก่อนกำหนดขณะรักษาตัวในโรงพยาบาล

วันที่ชี้แจง

ชื่อและสถานที่ทำงานของผู้วิจัย นางสาววารุณี มีหลาย นิสิตปริญญาเอก หลักสูตรปรัชญาดุษฎีบัณฑิต สาขาวิชาพยาบาลศาสตร์ (หลักสูตรนานาชาติ) คณะพยาบาลศาสตร์ มหาวิทยาลัยบูรพา

ผู้ให้ทุนวิจัย

ท่านได้รับการเชิญชวนให้เข้าร่วมในโครงการวิจัยนี้ แต่ก่อนที่ท่านจะตกลงใจเข้าร่วมหรือไม่ โปรดอ่านข้อความในเอกสารนี้ทั้งหมด เพื่อให้ทราบว่า เหตุใดท่านจึงได้รับเชิญให้เข้าร่วมในโครงการวิจัยนี้ โครงการวิจัยนี้ทำเพื่ออะไร หากท่านเข้าร่วมโครงการวิจัยนี้ท่านจะต้องทำอะไรบ้าง รวมทั้งข้อดีและข้อเสียที่อาจจะเกิดขึ้นในระหว่างการวิจัย

ในเอกสารนี้ อาจมีข้อความที่ท่านอ่านแล้วยังไม่เข้าใจ โปรดสอบถามผู้วิจัยหรือผู้ช่วยผู้วิจัยที่ทำโครงการนี้เพื่อให้อธิบายจนกว่าท่านจะเข้าใจ ท่านจะได้รับเอกสารนี้ 1 ชุด กลับไปอ่านที่บ้านเพื่อปรึกษาหารือกับญาติพี่น้อง เพื่อนหรือแพทย์ที่ท่านรู้จัก ให้ช่วยตัดสินใจว่าควรจะเข้าร่วมโครงการวิจัยนี้หรือไม่ การเข้าร่วมในโครงการวิจัยครั้งนี้จะต้องเป็น**ความสมัครใจ**ของท่าน ไม่มีการบังคับหรือชักจูง **ถึงแม้ท่านจะไม่เข้าร่วมในโครงการวิจัย ท่านก็จะได้รับการรักษาพยาบาลตามปกติ การไม่เข้าร่วมหรือถอนตัวจากโครงการวิจัยนี้ จะไม่มีผลกระทบต่อการได้รับบริการการรักษาพยาบาลหรือผลประโยชน์ที่พึงจะได้รับของท่านแต่อย่างใด**

โปรดอย่าลงลายมือชื่อของท่านในเอกสารนี้จนกว่าท่านจะแน่ใจว่ามีความประสงค์จะเข้าร่วมในโครงการวิจัยนี้ คำว่า "ท่าน" ในเอกสารนี้ หมายถึงผู้เข้าร่วมโครงการวิจัยในฐานะเป็นอาสาสมัครในโครงการวิจัยนี้ หากท่านเป็น**ผู้แทนโดยชอบธรรม**ของผู้ที่จะเข้าร่วมในโครงการวิจัย และลงนามแทนในเอกสารนี้ โปรดเข้าใจว่า "ท่าน" ในเอกสารนี้หมายถึงผู้เข้าร่วมในโครงการวิจัยเท่านั้น

วัตถุประสงค์ของโครงการวิจัยนี้คืออะไร

โครงการวิจัยนี้มีวัตถุประสงค์เพื่อพัฒนาและทดสอบประสิทธิผลของโปรแกรมการดูแลพัฒนาการของทารกคลอดก่อนกำหนดแบบเบ็ดเสร็จต่อการรับรู้สมรรถนะในตนเองของผู้ปกครอง การเจริญเติบโต และพัฒนาการด้านประสาทพฤติกรรมของทารกคลอดก่อนกำหนดขณะรักษาตัวในโรงพยาบาล โครงการวิจัยนี้ประกอบด้วย 2 ระยะ โดยระยะนี้เป็นระยะที่ 1 มีวัตุประสงค์เพื่อพัฒนาโปรแกรมการดูแลพัฒนาการของทารกคลอดก่อนกำหนดแบบเบ็ดเสร็จ

การรักษาที่จะให้และโอกาสที่อาสาสมัครจะได้รับการสุ่มเข้ากลุ่มศึกษา (ถ้ามี)

การเข้าร่วมโครงการวิจัยระยะนี้เป็นเพียงการสอบถามความคิดเห็นของท่านไม่มีการสุ่มให้เข้ากลุ่มการศึกษา

วจ 16 (ใหม่)

ขั้นตอนวิธีการดำเนินการวิจัยที่จะปฏิบัติต่อท่านเป็นอย่างไร

หากท่านตกลงที่จะเข้าร่วมการศึกษาวิจัยนี้ ข้าพเจ้านัดหมายท่านในช่วงเวลาตามความสะดวกของท่านเพื่อดำเนินการสัมภาษณ์เกี่ยวกับการมีส่วนร่วมในการส่งเสริมพัฒนาการของทารกคลอดก่อนกำหนดขณะรักษาตัวในโรงพยาบาล โดยจะดำเนินการสัมภาษณ์ในห้องที่เป็นส่วนตัวในหอผู้ป่วยทารกแรกเกิดวิกฤตใช้เวลาสัมภาษณ์ประมาณ 45-60 นาที ทั้งนี้หากข้อมูลยังไม่ครบถ้วนผู้วิจัยอาจจะนัดหมายท่านเพื่อให้สัมภาษณ์เพิ่มเติมอีกครั้ง

จะมีการทำโครงการวิจัยนี้ที่ใด และมีจำนวนผู้เข้าร่วมโครงการวิจัยทั้งสิ้นเท่าไร

ข้าพเจ้าวางแผนจะมีอาสาสมัครเข้าร่วมโครงการเป็นบิดามารดาอายุตั้งแต่แต่ 18 ปีขึ้นไป ที่มีบุตรมารับการรักษาที่หอผู้ป่วยทารกแรกเกิดวิกฤต โรงพยาบาลชลบุรี จำนวน 10 คน

ระยะเวลาที่ท่านจะต้องร่วมโครงการวิจัยและจำนวนครั้งที่นัด

ท่านจะร่วมอยู่ในโครงการวิจัยเป็นเวลา 1 สัปดาห์ โดยผู้วิจัยจะนัดหมายท่าน 1-2 ครั้ง

หน้าที่/ความรับผิดชอบของท่านต่อการเป็นอาสาสมัคร

เมื่อท่านตกลงที่จะเข้าร่วมการศึกษาวิจัยนี้ ข้าพเจ้าขอความร่วมมือท่านในการให้สัมภาษณ์และตอบแบบสอบถามข้อมูลส่วนบุคคล โดยผู้วิจัยจะดำเนินการสัมภาษณ์ในห้องที่เป็นส่วนตัวในหอผู้ป่วยทารกแรกเกิดวิกฤตในช่วงเวลาที่นัดหมายตามความสะดวกของท่าน โดยใช้เวลาสัมภาษณ์ประมาณ 45-60 นาที ทั้งนี้หากข้อมูลยังไม่ครบถ้วนผู้วิจัยอาจจะนัดหมายท่านเพื่อให้สัมภาษณ์เพิ่มเติมอีกครั้ง

ความไม่สุขสบาย หรือความเสี่ยงต่ออันตรายที่อาจจะได้รับจากกรรมวิธีการวิจัยมีอะไรบ้าง และวิธีการป้องกัน/แก้ไขที่ผู้วิจัยเตรียมไว้หากมีเหตุการณ์ดังกล่าวเกิดขึ้น

โครงการวิจัยระยะนี้ไม่มีความเสี่ยง

ประโยชน์ที่คาดว่าท่านจะได้รับจากโครงการวิจัย

ผลของการวิจัยนี้จะเป็นประโยชน์ในการพัฒนาโปรแกรมการดูแลพัฒนาการของทารกคลอดก่อนกำหนดขณะรักษาตัวในโรงพยาบาล เพื่อส่งเสริมให้ทารกคลอดก่อนกำหนดมีพัฒนาการด้านประสาทพฤติกรรม และการเจริญเติบโตของทารกเกิดก่อนกำหนดที่ดี รวมทั้งส่งเสริมสมรรถนะในตนเองของบิดาหรือมารดาในการดูแลทารกคลอดก่อนกำหนดต่อไป

หากท่านไม่เข้าร่วมโครงการวิจัยนี้ ท่านมีทางเลือกอื่นอย่างไรบ้าง

หากท่านไม่ได้เข้าร่วมโครงการวิจัยนี้ ท่านและทารกในความปกครองของท่านยังคงได้รับการดูแลตามปกติตามมาตรฐานการดูแลของทางโรงพยาบาล

ค่าใช้จ่ายที่ผู้เข้าร่วมในโครงการวิจัยจะต้องรับผิดชอบ (ถ้ามี)

เนื่องจากโครงการวิจัยนี้ดำเนินการในช่วงที่บุตรของท่านรับการรักษาอยู่ในโรงพยาบาลจึงไม่มีค่าใช้จ่ายใด ๆ เพิ่มเติมที่เกี่ยวข้องกับการดำเนินการ

ค่าเดินทาง หรืออื่น ๆ ที่จะได้รับเมื่อเข้าร่วมโครงการวิจัย (ถ้ามี)

ท่านจะได้ค่าชดเชยการเสียเวลาหรือค่าใช้จ่ายในการเดินทางจำนวน 200 บาท

ค่าชดเชยกรณีเกิดอันตรายที่เกี่ยวข้องกับโครงการวิจัยนี้เป็นอย่างไร

ในกรณีที่ท่านได้รับการบาดเจ็บจากการวิจัย ท่านจะได้รับการรักษาตามมาตรฐานการรักษาและตามสิทธิของท่าน โดยข้าพเจ้าจะให้ความช่วยเหลือประสานงานการให้การรักษาท่านอย่างเต็มที่

หากเกิดอันตรายที่เกี่ยวข้องกับโครงการวิจัยนี้ จะติดต่อกับใครและได้รับการปฏิบัติอย่างไร

หากเกิดอันตรายที่เกี่ยวข้องกับโครงการวิจัยนี้ สามารถติดต่อข้าพเจ้า นางสาววารุณี มีหลาย คณะพยาบาลศาสตร์ มหาวิทยาลัยบูรพา โทรศัพท์มือถือหมายเลข 086-5291539 ข้าพเจ้าจะให้ความช่วยเหลือประสานงานการให้การรักษาท่านอย่างเต็มที่ โดยท่านจะได้รับการรักษาตามมาตรฐานการรักษาและตามสิทธิของท่าน หรือติดต่อที่ รองศาสตราจารย์ ดร.จินตนา วัชรสินธุ์ อาจารย์ที่ปรึกษา โทรศัพท์มือถือหมายเลข 081-4019472

เหตุผลที่ท่านอาจถูกถอนจากการเป็นอาสาสมัครของโครงการวิจัยนี้

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หากท่านมีคำถามที่เกี่ยวข้องกับโครงการวิจัย จะถามใคร ระบุชื่อผู้วิจัยหรือผู้ร่วมวิจัย

หากท่านมีคำถามหรือข้อสงสัยประการใดสามารถติดต่อข้าพเจ้า นางสาววารุณี มีหลาย คณะพยาบาลศาสตร์ มหาวิทยาลัยบูรพา โทรศัพท์มือถือหมายเลข 086-5291539 ข้าพเจ้ายินดีตอบคำถามและข้อสงสัยของท่านทุกเมื่อ หรือติดต่อที่ รองศาสตราจารย์ ดร.จินตนา วัชรสินธุ์ อาจารย์ที่ปรึกษา โทรศัพท์มือถือหมายเลข 081-4019472

หากท่านรู้สึกว่าได้รับการปฏิบัติอย่างไม่เป็นธรรมในระหว่างโครงการวิจัยนี้ ท่านอาจแจ้งเรื่องได้ที่

ประธานคณะกรรมการวิจัยและจริยธรรมการวิจัย โรงพยาบาลชลบุรี โทร 0-38931047-8

ข้อมูลส่วนตัวของท่านที่ได้จากโครงการวิจัยครั้งนี้จะถูกนำไปใช้ดังต่อไปนี้

ข้อมูลต่าง ๆ ของท่านและทารกในความปกครองของท่านจะถูกเก็บเป็นความลับ และใช้รหัสตัวเลขแทนการระบุชื่อ การนำเสนอข้อมูลที่ได้จากโครงการวิจัย เพื่อประโยชน์ทางวิชาการจะเป็นในภาพรวม ทั้งนี้ข้อมูลจะถูกเก็บไว้ในคอมพิวเตอร์ที่มีรหัสผ่านของผู้วิจัยเท่านั้น ส่วนเอกสารจะถูกเก็บไว้ในตู้เอกสารที่ใส่กุญแจไว้เป็นเวลา 1 ปีหลังจากการเผยแพร่ผลการวิจัยและจะถูกทำลายหลังจากนั้น

ท่านจะถอนตัวออกจากโครงการวิจัยหลังจากได้ลงนามเข้าร่วมโครงการวิจัยแล้วได้หรือไม่

การเข้าร่วมการศึกษาวิจัยนี้เป็นไปโดยสมัครใจ ท่านมีสิทธิปฏิเสธที่จะเข้าร่วมหรือถอนตัวจากโครงการวิจัยนี้ได้ตลอดเวลา โดยการปฏิเสธหรือถอนตัวของท่านจะไม่มีผลกระทบต่อสิทธิประการใด ๆ ที่ท่านและทารกในการปกครองของท่านพึงจะได้รับ

หากมีข้อมูลใหม่ที่เกี่ยวข้องกับโครงการวิจัย ท่านจะได้รับแจ้งข้อมูลนั้นโดยผู้วิจัยหรือผู้วิจัยร่วมนั้นทันที (ในกรณีที่เป็นการวิจัยเกี่ยวข้องกับการรักษาโดยเฉพาะการใช้ยา)

การวิจัยนี้เป็นการวิจัยที่เกี่ยวข้องกับการพยาบาลที่เน้นการให้ความรู้และฝึกทักษะการดูแลทารกคลอดก่อนกำหนดไม่ได้เป็นการวิจัยเกี่ยวข้องกับการรักษาที่ใช้ยา

วจ 16 (ใหม่)

หมายเหตุ: 1. ผู้วิจัยควรมอบลำเนาแบบยินยอมอาสาสมัคร พร้อมแบบคำชี้แจงอาสาสมัคร อย่างละ 1 ชุด ให้อาสาสมัครหรือผู้ปกครองด้วย

2. เมื่อการวิจัยทางคลินิก (เพื่อการรักษาหรือไม่ก็ตาม) เกี่ยวข้องกับอาสาสมัครซึ่งต้องขอความยินยอมจากผู้แทนโดยชอบธรรม (เช่น ผู้เยาว์ หรือผู้ป่วยโรคสมองเสื่อมรุนแรง) อาสาสมัครควรได้รับการอธิบายเกี่ยวกับการวิจัยด้วยวิธีที่เหมาะสมที่อาสาสมัครนั้นจะเข้าใจได้ และถ้าทำได้อาสาสมัครควรลงนามและลงวันที่ในแบบยินยอมด้วยตนเอง

วจ 16 (ใหม่)

หนังสือแสดงเจตนายินยอมเข้าร่วมการวิจัย (Informed Consent)

ชื่อโครงการวิจัย: ประสิทธิผลของโปรแกรมการดูแลพัฒนาการของทารกคลอดก่อนกำหนดแบบเบ็ดเสร็จต่อการรับรู้สมรรถนะในตนเองของผู้ปกครอง การเจริญเติบโตและพัฒนาการด้านประสาทพฤติกรรมของทารกคลอดก่อนกำหนดขณะรักษาตัวในโรงพยาบาล

ข้าพเจ้า (นาย, นาง, นางสาว).....นามสกุล.....อายุ.....ปี

อยู่บ้านเลขที่.....หมู่ที่.....ตำบล.....อำเภอ.....จังหวัด.....

เป็นบิดา/มารดา/ผู้ปกครองของ (ด.ญ., ด.ช.).....อายุ.....ปี (ในกรณีที่อาสาสมัครเป็นเด็กอายุน้อยกว่า 18 ปี)

ได้รับฟังคำอธิบายจาก นางสาววารุณี มีหลาย

- ก่อนที่จะลงนามในใบยินยอมให้ทำการวิจัยนี้ ข้าพเจ้าได้รับการอธิบายจากผู้วิจัยถึงวัตถุประสงค์ของการวิจัย วิธีการวิจัย อันตราย หรืออาการที่อาจเกิดขึ้นจากการวิจัย หรือจากยาที่ใช้ รวมทั้งประโยชน์ที่คาดว่าจะเกิดขึ้นจากการวิจัยอย่างละเอียด และมีความเข้าใจดีแล้ว
- ผู้วิจัยรับรองว่าจะตอบคำถามที่ข้าพเจ้าสงสัยด้วยความเต็มใจ และไม่ปิดบังซ่อนเร้น จนข้าพเจ้าพอใจ
- ข้าพเจ้าเข้าร่วมในโครงการวิจัยนี้ด้วยความสมัครใจ โดยปราศจากการบังคับหรือชักจูง
- ข้าพเจ้ามีสิทธิที่จะบอกเลิกการเข้าร่วมในโครงการวิจัยเมื่อใดก็ได้ และการบอกเลิกนี้จะไม่มีผลต่อการรักษาพยาบาลที่ข้าพเจ้าจะพึงได้รับในปัจจุบันและในอนาคต
- ผู้วิจัยรับรองว่าจะเก็บข้อมูลเกี่ยวกับตัวข้าพเจ้าเป็นความลับ และจะเปิดเผยเฉพาะในรูปของสรุปผลการวิจัยโดยไม่มีการระบุชื่อนามสกุลของข้าพเจ้า การเปิดเผยข้อมูลเกี่ยวกับตัวข้าพเจ้าต่อหน่วยงานต่างๆ ที่เกี่ยวข้อง จะกระทำด้วยเหตุผลทางวิชาการเท่านั้น
- ผู้วิจัยรับรองว่าหากเกิดอันตรายใดๆ จากการวิจัย ข้าพเจ้าจะได้รับการรักษาพยาบาล ตามที่ระบุในเอกสารชี้แจงข้อมูลแก่ผู้เข้าร่วมโครงการวิจัย ข้าพเจ้าจะรายงานอาการข้างเคียงขึ้นให้แพทย์หรือเจ้าหน้าที่ที่ทำดังปฏิบัติงานอยู่ในขณะนั้นทราบทันที
- ข้าพเจ้าจะได้รับเอกสารชี้แจงข้อมูลแก่ผู้เข้าร่วมโครงการวิจัย เก็บไว้ 1 ชุด

ข้าพเจ้าได้อ่านและเข้าใจคำอธิบายข้างต้นแล้ว จึงได้ลงนามยินยอมเป็นอาสาสมัครของโครงการวิจัยดังกล่าว

ลายมือชื่ออาสาสมัคร .....

(.....)

วัน/เดือน/ปี .....

ลายมือชื่อผู้ให้ข้อมูล .....

(.....)

วัน/เดือน/ปี .....

ลายมือชื่อผู้วิจัยหลัก .....

(.....)

วัน/เดือน/ปี .....

หมายเหตุ: (1) ในกรณีที่อาสาสมัครเป็นเด็กโตแต่อายุไม่ถึง 18 ปี สามารถตัดสินใจเองได้ ให้ลงลายมือชื่อทั้งอาสาสมัคร (เด็ก)และผู้ปกครองด้วย

(2) แพทย์ผู้รักษาต้องไม่เป็นผู้ขอความยินยอมอาสาสมัคร แต่สามารถให้ข้อมูล/คำอธิบายได้

(3) ในกรณีที่อาสาสมัครไม่สามารถอ่านหนังสือ/ลงลายมือชื่อ ได้ ให้ใช้การประทับลายมือแทนดังนี้:

ข้าพเจ้าไม่สามารถอ่านหนังสือได้ แต่ผู้วิจัยได้อ่านข้อความในแบบยินยอมนี้ให้แก่ข้าพเจ้าฟังจนเข้าใจดี ข้าพเจ้าจึงประทับตราลายนิ้วมือขวาของข้าพเจ้าในแบบยินยอมนี้ด้วยความเต็มใจ

ประทับลายนิ้วมือขวา

ลายมือชื่อผู้อธิบาย.....

(.....)

พยาน..... **(พยานต้องไม่ใช่แพทย์หรือผู้วิจัย)**

(.....)

วันที่.....เดือน.....พ.ศ.....

APPENDIX C

List of experts

บันทึกข้อความ

ส่วนงาน บัณฑิตวิทยาลัย มหาวิทยาลัยบูรพา โทร. ๒๗๐๐ ต่อ ๗๐๕, ๗๐๗
ที่ อว ๘๑๓๗/๒๑๘๖ วันที่ ๒๒ ตุลาคม พ.ศ. ๒๕๖๓
เรื่อง ขอเรียนเชิญเป็นผู้ทรงคุณวุฒิตรวจสอบความตรงของเครื่องมือวิจัย

เรียน นายแพทย์ปราการ ทัตติยกุล (คณะแพทยศาสตร์)

ด้วยนางสาววารุณี มีหลาย รหัสประจำตัว ๖๑๘๑๐๐๒๒ นิสิตหลักสูตรปรัชญาดุษฎีบัณฑิต สาขาวิชาพยาบาลศาสตร์ คณะพยาบาลศาสตร์ ได้รับอนุมัติเค้าโครงดุษฎีนิพนธ์ เรื่อง "Effectiveness of Comprehensive Preterm Infant Developmental Care Program on Parental Self-Efficacy, Growth and Neurobehavioral Development of Hospitalized Preterm Infants" โดยมี รองศาสตราจารย์ ดร.ภรภัทร เฮงอุดมทรัพย์ เป็นประธานกรรมการควบคุมดุษฎีนิพนธ์ และเสนอท่านเป็นผู้ทรงคุณวุฒิตรวจสอบความตรงของเครื่องมือวิจัย นั้น

ในการนี้ บัณฑิตวิทยาลัย มหาวิทยาลัยบูรพา จึงขอเรียนเชิญท่านซึ่งเป็นผู้ที่มีความรู้ ความสามารถและประสบการณ์สูง เป็นผู้ทรงคุณวุฒิตรวจสอบความตรงของเครื่องมือวิจัย (ดังแนบ) ทั้งนี้ สามารถติดต่อนิสิตดังรายนามข้างต้น ได้ที่หมายเลขโทรศัพท์ ๐๘๖-๕๒๙-๑๕๓๙ หรือที่ E-mail: warunee@bnc.ac.th

จึงเรียนมาเพื่อทราบและโปรดพิจารณา

(รองศาสตราจารย์ ดร.นุจรี ไชยมงคล)
คณบดีบัณฑิตวิทยาลัย

ที่ อว ๘๑๓๗/๗๖๒

บัณฑิตวิทยาลัย มหาวิทยาลัยบูรพา
๑๖๙ ถ.ลงหาดบางแสน ต.แสนสุข
อ.เมือง จ.ชลบุรี ๒๐๑๓๑

๒๒ ตุลาคม ๒๕๖๓

เรื่อง ขอเรียนเชิญเป็นผู้ทรงคุณวุฒิตรวจสอบความตรงของเครื่องมือวิจัย

เรียน ผู้อำนวยการโรงพยาบาลชลบุรี จังหวัดชลบุรี

สิ่งที่ส่งมาด้วย ๑. เค้าโครงดุษฎีนิพนธ์ (ฉบับย่อ)
๒. เครื่องมือวิจัย

ด้วยนางสาววารุณี มีหลาย รหัสประจำตัว ๖๑๘๑๐๐๒๒ นิสิตหลักสูตรปรัชญาดุษฎีบัณฑิต สาขาวิชาพยาบาลศาสตร์ คณะพยาบาลศาสตร์ ได้รับอนุมัติเค้าโครงดุษฎีนิพนธ์ เรื่อง “Effectiveness of Comprehensive Preterm Infant Developmental Care Program on Parental Self-Efficacy, Growth and Neurobehavioral Development of Hospitalized Preterm Infants” โดยมี รองศาสตราจารย์ ดร.ภรภัทร เฮงอุดมทรัพย์ เป็นประธานกรรมการควบคุมดุษฎีนิพนธ์ และเสนอบุคลากรในสังกัดของท่าน คือ แพทย์หญิงฐานัดดา ศิริพร กลุ่มงานกุมารเวชกรรม เป็นผู้ทรงคุณวุฒิตรวจสอบความตรงของเครื่องมือวิจัย นั้น

ในการนี้ บัณฑิตวิทยาลัย มหาวิทยาลัยบูรพา จึงขอเรียนเชิญแพทย์หญิงฐานัดดา ศิริพร ซึ่งเป็นผู้ที่มีความรู้ ความสามารถ และประสบการณ์สูง เป็นผู้ทรงคุณวุฒิตรวจสอบความตรงของเครื่องมือวิจัย (ดังแนบ) ทั้งนี้ สามารถติดต่อนิสิตดังรายนามข้างต้น ได้ที่หมายเลขโทรศัพท์ ๐๘๖-๕๒๙-๑๕๓๙ หรือที่ E-mail: warunee@bnc.ac.th

จึงเรียนมาเพื่อทราบและโปรดพิจารณา

ขอแสดงความนับถือ

(รองศาสตราจารย์ ดร.นุจรี ไชยมงคล)
คณบดีบัณฑิตวิทยาลัย ปฏิบัติการแทน
อธิการบดีมหาวิทยาลัยบูรพา

สำเนาเรียน แพทย์หญิงฐานัดดา ศิริพร

บัณฑิตวิทยาลัย มหาวิทยาลัยบูรพา
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ที่ อว ๘๑๓๗/๗๖๓

บัณฑิตวิทยาลัย มหาวิทยาลัยบูรพา
๑๖๙ ถ.ลงหาดบางแสน ต.แสนสุข
อ.เมือง จ.ชลบุรี ๒๐๑๓๑

๒๒ ตุลาคม ๒๕๖๓

เรื่อง ขอเรียนเชิญเป็นผู้ทรงคุณวุฒิตรวจสอบความตรงของเครื่องมือวิจัย

เรียน คณบดีคณะแพทยศาสตร์โรงพยาบาลรามาธิบดี มหาวิทยาลัยมหิดล กรุงเทพมหานคร

สิ่งที่ส่งมาด้วย ๑. เค้าโครงดุษฎีนิพนธ์ (ฉบับย่อ)
๒. เครื่องมือวิจัย

ด้วยนางสาววารุณี มีหลาย รหัสประจำตัว ๖๑๘๑๐๐๒๒ นิสิตหลักสูตรปรัชญาดุษฎีบัณฑิต สาขาวิชาพยาบาลศาสตร์ คณะพยาบาลศาสตร์ ได้รับอนุมัติเค้าโครงดุษฎีนิพนธ์ เรื่อง "Effectiveness of Comprehensive Preterm Infant Developmental Care Program on Parental Self-Efficacy, Growth and Neurobehavioral Development of Hospitalized Preterm Infants" โดยมี รองศาสตราจารย์ ดร.ภรภัทร เฮงอุดมทรัพย์ เป็นประธานกรรมการควบคุมดุษฎีนิพนธ์ และเสนอบุคลากรในสังกัดของท่าน คือ ผู้ช่วยศาสตราจารย์ ดร.ทิพวัลย์ ดารามาศ สาขาวิชาการพยาบาลเด็ก เป็นผู้ทรงคุณวุฒิตรวจสอบความตรงของเครื่องมือวิจัย นั้น

ในการนี้ บัณฑิตวิทยาลัย มหาวิทยาลัยบูรพา จึงขอเรียนเชิญผู้ช่วยศาสตราจารย์ ดร.ทิพวัลย์ ดารามาศ ซึ่งเป็นผู้ที่มีความรู้ ความสามารถ และประสบการณ์สูง เป็นผู้ทรงคุณวุฒิตรวจสอบความตรงของเครื่องมือวิจัย (ดังแนบ) ทั้งนี้ สามารถติดต่อนิสิตดังรายนามข้างต้น ได้ที่หมายเลขโทรศัพท์ ๐๘๖-๕๒๙-๑๕๓๙ หรือที่ E-mail: warunee@bnc.ac.th

จึงเรียนมาเพื่อทราบและโปรดพิจารณา

ขอแสดงความนับถือ

(รองศาสตราจารย์ ดร.นุจรี ไชยมงคล)
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อธิการบดีมหาวิทยาลัยบูรพา

สำเนาเรียน **๑. ผู้อำนวยการโรงเรียนพยาบาลรามาธิบดี**
๒. ผู้ช่วยศาสตราจารย์ ดร.ทิพวัลย์ ดารามาศ

บัณฑิตวิทยาลัย มหาวิทยาลัยบูรพา
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ที่ อว ๘๑๓๗/๗๖๔

บัณฑิตวิทยาลัย มหาวิทยาลัยบูรพา
๑๖๙ ถ.ลงหาดบางแสน ต.แสนสุข
อ.เมือง จ.ชลบุรี ๒๐๑๓๑

๒๒ ตุลาคม ๒๕๖๓

เรื่อง ขอเรียนเชิญเป็นผู้ทรงคุณวุฒิตรวจสอบความตรงของเครื่องมือวิจัย

เรียน คณบดีคณะพยาบาลศาสตร์ มหาวิทยาลัยเชียงใหม่ จังหวัดเชียงใหม่

สิ่งที่ส่งมาด้วย ๑. เค้าโครงดุษฎีนิพนธ์ (ฉบับย่อ)
๒. เครื่องมือวิจัย

ด้วยนางสาววารุณี มีหลาย รหัสประจำตัว ๖๑๘๑๐๐๒๒ นิสิตหลักสูตรปรัชญาดุษฎีบัณฑิต สาขาวิชาพยาบาลศาสตร์ คณะพยาบาลศาสตร์ ได้รับอนุมัติเค้าโครงดุษฎีนิพนธ์ เรื่อง "Effectiveness of Comprehensive Preterm Infant Developmental Care Program on Parental Self-Efficacy, Growth and Neurobehavioral Development of Hospitalized Preterm Infants" โดยมี รองศาสตราจารย์ ดร.ภรภัทร เฮงอุดมทรัพย์ เป็นประธานกรรมการควบคุมดุษฎีนิพนธ์ และเสนอบุคลากรในสังกัดของท่าน คือ รองศาสตราจารย์ ดร.พัชรี วรกิจพูนผล และผู้ช่วยศาสตราจารย์ ดร.เนตรทอง นามพรม กลุ่มวิชาการพยาบาลกุมารเวชศาสตร์ เป็นผู้ทรงคุณวุฒิตรวจสอบความตรงของเครื่องมือวิจัย นั้น

ในการนี้ บัณฑิตวิทยาลัย มหาวิทยาลัยบูรพา จึงขอเรียนเชิญรองศาสตราจารย์ ดร.พัชรี วรกิจพูนผล และผู้ช่วยศาสตราจารย์ ดร.เนตรทอง นามพรม ซึ่งเป็นผู้ที่มีความรู้ ความสามารถ และประสบการณ์สูง เป็นผู้ทรงคุณวุฒิตรวจสอบความตรงของเครื่องมือวิจัย (ดังแนบ) ทั้งนี้ สามารถติดต่อนิสิตดังรายนามข้างต้นได้ที่ หมายเลขโทรศัพท์ ๐๘๖-๕๒๙-๑๕๓๙ หรือที่ E-mail: warunee@bnc.ac.th

จึงเรียนมาเพื่อทราบและโปรดพิจารณา

ขอแสดงความนับถือ

(รองศาสตราจารย์ ดร.นุจรี ไชยมงคล)
คณบดีบัณฑิตวิทยาลัย ปฏิบัติการแทน
อธิการบดีมหาวิทยาลัยบูรพา

สำเนาเรียน **๑. รองศาสตราจารย์ ดร.พัชรี วรกิจพูนผล**
๒. ผู้ช่วยศาสตราจารย์ ดร.เนตรทอง นามพรม

บัณฑิตวิทยาลัย มหาวิทยาลัยบูรพา
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ที่ อว ๘๑๓๗/๔๗๖

บัณฑิตวิทยาลัย มหาวิทยาลัยบูรพา
๑๖๙ ถ.ลงหาดบางแสน ต.แสนสุข
อ.เมือง จ.ชลบุรี ๒๐๑๓๑

๓๑ กรกฎาคม ๒๕๖๓

เรื่อง ขอเรียนเชิญบุคลากรในสังกัดเป็นผู้ทรงคุณวุฒิแปลเครื่องมือวิจัย

เรียน ผู้อำนวยการวิทยาลัยพยาบาลบรมราชชนนี ชลบุรี

สิ่งที่ส่งมาด้วย เครื่องมือวิจัย จำนวน ๕ หน้า

ด้วย นางสาววารุณี มีหลาย รหัสประจำตัว ๖๑๘๑๐๐๒๒ นิสิตหลักสูตรปรัชญาดุษฎีบัณฑิต สาขาวิชาพยาบาลศาสตร์ (หลักสูตรนานาชาติ) คณะพยาบาลศาสตร์ ได้รับอนุมัติเค้าโครงดุษฎีนิพนธ์ เรื่อง "Effectiveness of Comprehensive Preterm Infant Developmental Care Program on parental self-efficacy, growth and neurobehavioral development of hospitalized preterm infants" โดยมี รองศาสตราจารย์ ดร.ภรภัทร เฮงอุดมทรัพย์ เป็นประธานกรรมการควบคุมดุษฎีนิพนธ์ และเสนอบุคลากรในสังกัดท่านเป็นผู้ทรงคุณวุฒิแปลเครื่องมือวิจัย นั้น

ในการนี้ บัณฑิตวิทยาลัย มหาวิทยาลัยบูรพา จึงขอเรียนเชิญบุคลากรในสังกัดท่าน คือ ดร.สมปรารถนา สุดใจนาค ซึ่งเป็นผู้ที่มีความรู้ ความสามารถ และประสบการณ์สูง เป็นผู้ทรงคุณวุฒิแปลเครื่องมือวิจัยจากภาษาอังกฤษเป็นภาษาไทย (ดังแนบ) ทั้งนี้ สามารถติดต่อนิสิตดังรายนามข้างต้น ได้ที่เบอร์โทร ๐๘-๖๕๒๙-๑๕๓๙ หรือที่ E-mail: warunee@bnc.ac.th

จึงเรียนมาเพื่อโปรดทราบและโปรดพิจารณา

ขอแสดงความนับถือ

(ผู้ช่วยศาสตราจารย์ ดร.โสรัตน์ วงศ์สุทธิธรรม)
รองคณบดีบัณฑิตวิทยาลัย รักษาการแทน
คณบดีบัณฑิตวิทยาลัย ปฏิบัติการแทน
อธิการบดีมหาวิทยาลัยบูรพา

บัณฑิตวิทยาลัย มหาวิทยาลัยบูรพา
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ที่ อว ๘๑๓๗/๔๗๗

บัณฑิตวิทยาลัย มหาวิทยาลัยบูรพา
๑๖๙ ถ.ลงหาดบางแสน ต.แสนสุข
อ.เมือง จ.ชลบุรี ๒๐๑๓๑

๓๑ กรกฎาคม ๒๕๖๓

เรื่อง ขอเรียนเชิญบุคลากรในสังกัดเป็นผู้ทรงคุณวุฒิแปลเครื่องมือวิจัย

เรียน ผู้อำนวยการวิทยาลัยพยาบาลบรมราชชนนี ชลบุรี

สิ่งที่ส่งมาด้วย เครื่องมือวิจัย จำนวน ๕ หน้า

ด้วย นางสาววารุณี มีหลาย รหัสประจำตัว ๖๑๘๑๐๐๒๒ นิสิตหลักสูตรปรัชญาดุษฎีบัณฑิต สาขาวิชาพยาบาลศาสตร์ (หลักสูตรนานาชาติ) คณะพยาบาลศาสตร์ ได้รับอนุมัติเค้าโครงดุษฎีนิพนธ์ เรื่อง "Effectiveness of Comprehensive Preterm Infant Developmental Care Program on parental self-efficacy, growth and neurobehavioral development of hospitalized preterm infants" โดยมี รองศาสตราจารย์ ดร.ภรภัทร เฮงอุดมทรัพย์ เป็นประธานกรรมการควบคุมดุษฎีนิพนธ์ และเสนอบุคลากรในสังกัดท่านเป็นผู้ทรงคุณวุฒิแปลเครื่องมือวิจัย นั้น

ในการนี้ บัณฑิตวิทยาลัย มหาวิทยาลัยบูรพา จึงขอเรียนเชิญบุคลากรในสังกัดท่าน คือ ดร.บุญเตือน วัฒนกุล ซึ่งเป็นผู้ที่มีความรู้ ความสามารถ และประสบการณ์สูง เป็นผู้ทรงคุณวุฒิแปลเครื่องมือวิจัยจากภาษาอังกฤษเป็นภาษาไทย (ดังแนบ) ทั้งนี้ สามารถติดต่อนิสิตดังรายนามข้างต้น ได้ที่เบอร์โทร ๐๘-๖๕๒๙-๑๕๓๙ หรือที่ E-mail: warunee@bnc.ac.th

จึงเรียนมาเพื่อโปรดทราบและโปรดพิจารณา

ขอแสดงความนับถือ

(ผู้ช่วยศาสตราจารย์ ดร.โสรัตน์ วงศ์สุทธิธรรม)
รองคณบดีบัณฑิตวิทยาลัย รักษาการแทน
คณบดีบัณฑิตวิทยาลัย ปฏิบัติการแทน
อธิการบดีมหาวิทยาลัยบูรพา

บัณฑิตวิทยาลัย มหาวิทยาลัยบูรพา
โทร ๐๓๘ ๒๗๐ ๐๐๐ ต่อ ๗๐๗, ๗๐๕
E-mail: grd.buu@go.buu.ac.th
(สำเนาเรียน ดร.บุญเตือน วัฒนกุล)

ที่ อว ๘๑๓๗/๕๗๐

สำเนา

บัณฑิตวิทยาลัย มหาวิทยาลัยบูรพา
๑๖๙ ถ.ลงหาดบางแสน ต.แสนสุข
อ.เมือง จ.ชลบุรี ๒๐๑๓๑

๒๗ สิงหาคม พ.ศ. ๒๕๖๓

เรื่อง ขอเรียนเชิญบุคลากรในสังกัดเป็นผู้ทรงคุณวุฒิแปลเครื่องมือวิจัย

เรียน คณบดีคณะแพทยศาสตร์ โรงพยาบาลรามาธิบดี มหาวิทยาลัยมหิดล

สิ่งที่ส่งมาด้วย ๑. เครื่องมือวิจัย จำนวน ๑ ชุด
๒. สำเนาหลักฐานการได้รับอนุญาตให้แปลและใช้เครื่องมือวิจัย จำนวน ๑ ชุด

ด้วยนางสาววารุณี มีหลาย รหัสประจำตัว ๖๑๘๑๐๐๒๒ นิสิตหลักสูตรปรัชญาดุษฎีบัณฑิต สาขาวิชาพยาบาลศาสตร์ (หลักสูตรนานาชาติ) คณะพยาบาลศาสตร์ ได้รับอนุมัติเค้าโครงดุษฎีนิพนธ์ เรื่อง Effectiveness of comprehensive preterm infants developmental care program on parental self-efficacy, growth and neurobehavioral development of hospitalized preterm infants โดยมี รองศาสตราจารย์ ดร.ภรภัทร เฮงอุดมทรัพย์ เป็นประธานกรรมการควบคุมดุษฎีนิพนธ์ และเสนอบุคลากรในสังกัดของท่านเป็นผู้ทรงคุณวุฒิแปลเครื่องมือวิจัย นั้น

ในการนี้ บัณฑิตวิทยาลัย มหาวิทยาลัยบูรพา จึงขอเรียนเชิญบุคลากรในสังกัดท่าน คือ ดร.จำปี เกรนเจอร์ ซึ่งเป็นผู้ที่มีความรู้ ความสามารถ และประสบการณ์สูงเป็นผู้ทรงคุณวุฒิแปลเครื่องมือวิจัยจากภาษาไทยเป็นภาษาอังกฤษ (ดังแนบ)

ทั้งนี้ สามารถติดต่อนิสิตดังรายนามข้างต้น ได้ที่เบอร์โทร ๐๘-๖๕๒๙-๑๕๓๙ หรือที่ E-mail: warunee@bnc.ac.th

จึงเรียนมาเพื่อโปรดทราบและโปรดพิจารณา

ขอแสดงความนับถือ

(รองศาสตราจารย์ ดร.นุจรี ไชยมงคล)
คณบดีบัณฑิตวิทยาลัย ปฏิบัติการแทน
อธิการบดีมหาวิทยาลัยบูรพา

สำเนาเรียน: ๑. ผู้อำนวยการโรงเรียนพยาบาลรามาธิบดี
๒. ดร.จำปี เกรนเจอร์

บัณฑิตวิทยาลัย มหาวิทยาลัยบูรพา
โทร ๐๓๘ ๒๗๐ ๐๐๐ ต่อ ๗๐๑, ๗๐๕
E-mail: grd.buu@go.buu.ac.th

ที่ อว ๘๑๓๗/๕๖๙

บัณฑิตวิทยาลัย มหาวิทยาลัยบูรพา
๑๖๙ ถ.ลงหาดบางแสน ต.แสนสุข
อ.เมือง จ.ชลบุรี ๒๐๑๓๑

๒๗ สิงหาคม พ.ศ. ๒๕๖๓

เรื่อง ขอเรียนเชิญบุคลากรในสังกัดเป็นผู้ทรงคุณวุฒิแปลเครื่องมือวิจัย

เรียน ผู้อำนวยการวิทยาลัยพยาบาลบรมราชชนนี กรุงเทพฯ

สิ่งที่ส่งมาด้วย ๑. เครื่องมือวิจัย จำนวน ๑ ชุด
๒. สำเนาหลักฐานการได้รับอนุญาตให้แปลและใช้เครื่องมือวิจัย จำนวน ๑ ชุด

ด้วยนางสาววารุณี มีหลาย รหัสประจำตัว ๖๑๘๑๐๐๒๒ นิสิตหลักสูตรปรัชญาดุษฎีบัณฑิต สาขาวิชาพยาบาลศาสตร์ (หลักสูตรนานาชาติ) คณะพยาบาลศาสตร์ ได้รับอนุมัติเค้าโครงดุษฎีนิพนธ์ เรื่อง Effectiveness of comprehensive preterm infants developmental care program on parental self-efficacy, growth and neurobehavioral development of hospitalized preterm infants โดยมี รองศาสตราจารย์ ดร.ภรภัทร เฮงอุดมทรัพย์ เป็นประธานกรรมการควบคุมดุษฎีนิพนธ์ และเสนอบุคลากรในสังกัดของท่านเป็นผู้ทรงคุณวุฒิแปลเครื่องมือวิจัย นั้น

ในการนี้ บัณฑิตวิทยาลัย มหาวิทยาลัยบูรพา จึงขอเรียนเชิญบุคลากรในสังกัดท่าน คือ ดร.ศิริธร ยิ่งเรงเริง ซึ่งเป็นผู้ที่มีความรู้ ความสามารถ และประสบการณ์สูงเป็นผู้ทรงคุณวุฒิแปลเครื่องมือวิจัยจากภาษาไทยเป็นภาษาอังกฤษ (ดังแนบ)

ทั้งนี้ สามารถติดต่อนิสิตดังรายนามข้างต้น ได้ที่เบอร์โทร ๐๘-๖๕๒๙-๑๕๓๙ หรือที่ E-mail: warunee@bnc.ac.th

จึงเรียนมาเพื่อโปรดทราบและโปรดพิจารณา

ขอแสดงความนับถือ

(รองศาสตราจารย์ ดร.นุจรี ไชยมงคล)
คณบดีบัณฑิตวิทยาลัย ปฏิบัติการแทน
อธิการบดีมหาวิทยาลัยบูรพา

สำเนาเรียน: ดร.ศิริธร ยิ่งเรงเริง

บัณฑิตวิทยาลัย มหาวิทยาลัยบูรพา
โทร ๐๓๘ ๒๗๐ ๐๐๐ ต่อ ๗๐๑, ๗๐๕
E-mail: grd.buu@go.buu.ac.th

APPENDIX D

Permission letter

Gmail warunee Meelai <warunee@bnc.ac.th>

Ask your permission to use the Neonatal NeurobehavioralExamination: NNE (again)
2 ข้อความ

warunee Meelai <warunee@bnc.ac.th> 14 กรกฎาคม 2563 15:44
ถึง: "Morgan, Andrew Michael" <amm@uic.edu>

Dear Dr. Andrew M. Morgan

My name is Warunee Meelai, a doctoral candidate in nursing at Burapha University, Thailand. I have successfully passed the research proposal exam in the topic "Effectiveness of Comprehensive Preterm Infant Developmental Care Program on parental self-efficacy, growth and neurobehavioral development of hospitalized preterm infants" The committee has agreed to allow me to use your instrument (the Neonatal Neurobehavioral Examination: NNE) in my research. Therefore, I would like to ask for permission to use your instrument, as had been previously discussed with you. If you allow me to use it, could you please reply to my letter. I will look forward to your response.

Best Regards,

Warunee Meelai
Ph.D. Candidate
Faculty of Nursing, Burapha University
169 Long-Hard Bangsaen Road, Saensuk, Muang,
Chonburi, Thailand 20131

Morgan, Andrew Michael <amm@uic.edu> 15 กรกฎาคม 2563 01:28
ถึง: warunee Meelai <warunee@bnc.ac.th>

Yes you have my permission to use it.

Andrew Morgan

[ข้อความที่เกี่ยวข้องถูกซ่อนไว้]

Gmail warunee Meelai <warunee@bnc.ac.th>

Letter asking permission to use Perceived Maternal Parenting Self-Efficacy instrument

2 ข้อความ

warunee Meelai <warunee@bnc.ac.th> 27 มิถุนายน 2563 13:46
ถึง: c.barnes1@derby.ac.uk

Dear Doctor Christopher R. Barnes

My name is Warunee Meelai and I'm a doctoral nursing candidate at Burapha University, Thailand. My dissertation title is "Effectiveness of Comprehensive Preterm Infant Developmental Care Program on parental self-efficacy, growth and neurobehavioral development of hospitalized preterm infants"

I have read your article about "Perceived Maternal Parenting Self-Efficacy (PMP S-E) tool: development and validation with mothers of hospitalized preterm neonates. Journal of advanced nursing (2007), 60(5), 550-560.

I appreciate your work very much and I'm very interested in your developed research instrument named "Perceived Maternal Parenting Self-Efficacy (PMP S-E)". I truly believe that your tool will benefit greatly to parents of hospitalized preterm infants and create an effective nursing intervention that promotes parent self-efficacy in preterm infant care in Thailand.

Therefore, I would like to ask your permission to use and translate in Thai version of the instrument. If you kindly allow me to utilize it, could you please provide the questionnaire and its psychometrics properties for me?

If you have any questions, kindly contact me at my E-mail address, warunee@bnc.ac.th. I would like to thank you in advance for your kindness and any of your attention given to this request is greatly appreciated.

Best Regards,

Warunee Meelai
Ph.D. Candidate
Faculty of Nursing, Burapha University
169 Long-Hard Bangsaen Road, Saensuk, Muang,
Chonburi, Thailand 20131

Christopher Barnes <C.Barnes1@derby.ac.uk> 29 มิถุนายน 2563 16:29
ถึง: warunee Meelai <warunee@bnc.ac.th>

Dear Warunee

Thank you for your email enquiring about the use and translation of the PMPS-E scale. Yes - we would be very happy for you to use it and translate into a Thai version.

I have attached the scale to this email. All of the psychometrics are published in the paper you have already read. But if there is anything you are unsure about then please let me know.

best wishes,

Chris

Dr Christopher Barnes (C.Psychol, AFBPsS, SFHEA)
Programme Leader: MSc Applied Developmental Psychology
Senior Lecturer in Psychology
School of Human Sciences

T: +44 (0) 1332 592**216**
E: c.barnes1@derby.ac.uk

University of Derby,
Kedleston Road,
Derby
DE22 1GB

Connect with me
LinkedIn – Twitter – ResearchGate

From: warunee Meelai <warunee@bnc.ac.th>
Sent: 27 June 2020 7:46 AM
To: Christopher Barnes <C.Barnes1@derby.ac.uk>
Subject: Letter asking permission to use Perceived Maternal Parenting Self-Efficacy instrument

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PMPSE Questionnaire.pdf
9K

APPENDIX E

Research instruments

แบบสอบถามข้อมูลส่วนบุคคลและแนวคำถามในการสัมภาษณ์บิดาหรือมารดาเกี่ยวกับการมีส่วนร่วมในการส่งเสริมพัฒนาการของทารกคลอดก่อนกำหนดขณะรักษาตัวในโรงพยาบาล

รหัส..... วันที่.....

ส่วนที่ 1: ข้อมูลส่วนบุคคล

คำชี้แจง: กรุณากรอกข้อมูลในช่องว่างและทำเครื่องหมาย ✓ ลงในช่อง ☐ หน้าข้อความตรงกับตัวท่านมากที่สุด

ข้อมูลส่วนบุคคลของบิดาหรือมารดา

1. อายุ.....ปี
2. ความสัมพันธ์กับทารก

☐ บิดา ☐ มารดา

3. ระดับการศึกษาสูงสุด

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15. บุคคลสำคัญในชีวิตที่สามารถให้ความช่วยเหลือในการเลี้ยงดูบุตร.....

ข้อมูลส่วนบุคคลของทารก (ผู้วิจัยบันทึก)

1. วัน/เดือน/ปีเกิด..... เวลา.....
   เพศ..... Apgar score นาทีที่ 1 .....นาทีที่ 5 ……...นาทีที่ 10…….
   อายุครรภ์ประเมินโดย Ballard score.....สัปดาห์.....วัน CRIB Score.…คะแนน
2. การวินิจฉัยโรค.....

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4. ระยะเวลาในการรักษาตัวในโรงพยาบาล..... วัน

ส่วนที่ 2: แนวคำถามในการสัมภาษณ์บิดาหรือมารดาเกี่ยวกับการมีส่วนร่วมในการส่งเสริมพัฒนาการของทารกคลอดก่อนกำหนดขณะรักษาตัวในโรงพยาบาล

1. คุณวางแผนจะไปเยี่ยมลูกเมื่อไหร่ อย่างไร? เมื่อได้พบลูกคุณคิดว่าอยากทำอะไรบ้าง? ทำไมอยากทำแบบนั้น?
2. ครั้งแรกที่คุณมาเยี่ยมลูกในหอผู้ป่วยทารกแรกเกิดวิกฤต คุณรู้สึกอย่างไรเมื่อได้พบลูก? รู้สึกอย่างไรกับบุคลากรและสิ่งแวดล้อมในหอผู้ป่วยทารกแรกเกิดวิกฤต? การมาเยี่ยมครั้งนี้เป็นครั้งที่เท่าไหร่ คุณมาบ่อยแค่ไหน ตอนนี้รู้สึกต่างจากที่มาครั้งแรกอย่างไร อะไรที่ทำให้รู้สึกแตกต่างไป?
3. ……..
4. ……
5. …….
6. ……
7. อะไรคือสิ่งที่จะทำให้คุณมั่นใจและสามารถให้การดูแลลูกได้?

แบบสอบถามข้อมูลส่วนบุคคลของบิดาหรือมารดาและทารกคลอด

รหัส.....

ข้อมูลส่วนบุคคลของบิดาหรือมารดา

คำชี้แจง: กรุณากรอกข้อมูลในช่องว่างและทำเครื่องหมาย ✓ ลงในช่อง ☐ หน้าข้อความตรงกับตัวท่านมากที่สุด

1. อายุ.....ปี
2. ความสัมพันธ์กับทารก

☐ บิดา ☐ มารดา

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15. บุคคลสำคัญในชีวิตที่สามารถให้ความช่วยเหลือในการเลี้ยงดูบุตร.....

ข้อมูลส่วนบุคคลของทารก (ผู้ช่วยวิจัยบันทึก) รหัส.....

1. วัน/เดือน/ปีเกิด..... เวลา.....

   เพศ..... Apgar score นาทีที่ 1 .....นาทีที่ 5 ……..นาทีที่ 10…….

   อายุครรภ์ประเมินโดย Ballard score.....สัปดาห์.....วัน CRIB Score……คะแนน
2. การวินิจฉัยโรค.....

   .

   .

7. การเจริญเติบโต

   7.1 แรกเกิด

   น้ำหนักแรกเกิด..... กรัม

   ความยาว..... เซนติเมตร

   รอบศีรษะ..... เซนติเมตร

   7.2 วันที่ 14 ……..

   7.3 วันที่ 28 ……..

แบบประเมินความรุนแรงความเจ็บป่วยของทารก

Clinical Risk Index for Babies (CRIB) (ผู้ช่วยวิจัยบันทึก)

คำชี้แจง การประเมินความรุนแรงของอาการเจ็บป่วยของทารกให้ประเมินตามหัวข้อและให้คะแนนตามเกณฑ์ที่กำหนดให้

รายการประเมิน		คะแนน	คะแนนที่ได้	หมายเหตุ
1. Gestational age (week)	>24 weeks ……	0 …		
2. ……	>1350 g …. ….. …..	0 … … ….		
3. ……	….. ….. …..	0 … ….		
4. ……	>-7.0 mmol/l -7.0 to -9.9mmol/l -10 to -14.9mmol/l ≤15mmol/l	0 … … ….		
5. …..	≤0.40 …. ….. …..	0 … … ….		
6. Maximum appropriate FiO_2 in first 12-hr	≤0.40 ….. ….. …..	0 … … ….		
		คะแนนรวม		

**Excluding inevitable lethal malformations FiO_2: Fraction of inspired oxygen

การแบ่งระดับคะแนน แบ่งเป็น 4 กลุ่ม ดังนี้ 0-5 คะแนน, 6-10 คะแนน, 11-15 คะแนน, มากกว่า 15 คะแนน คะแนนยิ่งสูงหมายถึง มีภาวะเสี่ยงต่อการเสียชีวิต

แบบสอบถามการรับรู้สมรรถนะแห่งตนในการเลี้ยงดูทารกของมารดา (PMP S-E)

<u>คำชี้แจง</u>

ข้อคำถามเหล่านี้กล่าวถึงการมีปฏิสัมพันธ์กันระหว่างท่านและบุตรของท่าน กรุณาทำเครื่องหมาย (✓) ลงในช่องที่ตรงกับความรู้สึกของท่านมากที่สุดในการรับรู้แต่ละสถานการณ์ เช่น ไม่เห็นด้วยอย่างยิ่ง ไม่เห็นด้วย เห็นด้วย เห็นด้วยอย่างยิ่ง

ข้อที่	รายการ	ไม่เห็นด้วยอย่างยิ่ง	ไม่เห็นด้วย	เห็นด้วย	เห็นด้วยอย่างยิ่ง
	ปัจจัยด้านที่ 1: ขั้นตอนการดูแล				
1	ฉันดูแลลูกได้ดี				
2	ฉันป้อนนมลูกได้ดี				
3	.....				
4	.....				
5	.....				
6	.....				
7	.....				
	ปัจจัยด้านที่ 4: ความเชื่อตามสถานการณ์				
18	.....				
19	.....				
20	ฉันสามารถแสดงความรักกับลูกของฉันได้				

แบบประเมินพัฒนาการด้านประสาทพฤติกรรมของทารก

(Neonatal Neurobehavioral Examination) (ผู้ช่วยวิจัยบันทึก)

คำชี้แจง ให้ท่านประเมินพฤติกรรมทางระบบประสาทของทารกลงใน Neonatal Neurobehavioral Examination Scoring Sheet ซึ่งประกอบด้วยการประเมิน 3 ส่วน ได้แก่

A. Tone and Motor Pattern, Abnormal Patterns

B. Primitive Reflexes, Abnormal Patterns

C. Behavioral Responses, Responsiveness, Temperament, Equilibration

Neonatal Neurobehavioral Examination Scoring Sheet

รหัส ……

Date of Birth …… Gestational Age……

Date of Exam…… Chronological Age……

Timing of Exam……..…… Corrected Age……..……

STATES

1. Deep sleep, no movement, regular breathing
2. Light sleep, eyes shut, some movement
3. Dozing, eye opening and closing
4. Awake, eyes open, minimal movement
5. Wide awake, vigorous movement
6. Crying

	1 (<32 wk.)	2 (32-36 wk.)	3 (>36 wk.)	A (Abnormal)
A. TONE AND MOTOR PATTERNS				
POSTURE (Predominant)	 total extension	 LE flexed, UE extended	 total flexion	opisthotonus tonic extension
ARM RECOIL Infant supine; take arms and extend parallel to the body; hold several secs and release.	 no flexion within 5 sec.	 partial flexion at elbow >100° within 4-5 sec.	 arms flex at elbow to <100° within 2-3 sec.	difficult to extend jerky flexion
SCARF Infant supine. Head in midline. Bring arm across chest until resistance is met.	 no resistance	 limited resistance past midline	 at or before midline	tonic flexion shoulder retraction
POPLITEAL ANGLE Infant supine. Approximate knee and thigh to abdomen; extend leg by gentle pressure with index finger behind ankle.	 180-135°	 90-135°	 90-60°	 <60°
ANKLE DORSIFLEXION Infant supine. Flex foot against shin until resistance is met.	 limited 60-90°	 partial 30-60°	complete <30°	equinus >90°
PRONE SUSPENSION Hold infant in ventral suspension; observe curvature of back and relation of head to trunk.	 complete	 partial	 near horizontal	 tonic extension
SLIP-THROUGH Hold infant in vertical suspension under axillae. Observe amount of support required to prevent infant from "slipping."	 complete	 partial	 none	 shoulder retraction
PULL-TO-SIT Pull infant toward sitting posture by traction on both arms.	 complete head lag	 partial flexion	 occasional alignment	tonic extension shoulder retraction
HEAD RIGHTING Place infant in sitting position; allow head to fall forward; wait 30 sec.	 no attempt to raise head	 unsuccessful attempt to raise head upright	 occasional alignment	 head cannot be flexed forward

Neonatal Neurobehavioral Examination Scoring Sheet (Continued)

	1 (<32 wk.)	2 (32-36 wk.)	3 (>36 wk.)	A (Abnormal)
B. PRIMITIVE REFLEXES				
ROOT	absent	mouth opening, partial head turning	full head turning with mouth opening	tongue thrust
SUCK	weak	inconsistent, irregular	strong regular sucking in bursts of 5 or more movements	clenching-tonic bite
GRASP	absent	sustained flexion	traction	thumb adduction
POSITIVE SUPPORT	astasia	inconsistent, partial	full extension	equinus
WALKING	no response	some effort but not continuous with both legs	at least two steps	scissoring
CROSSED EXTENSOR	no response	withdrawal and flexion	flexion & extension	tonic extension
MORO	no response	abduction only	abduction & adduction	tremor only
TONIC NECK	no response	legs only	arms & legs respond	obligate
CRY	absent	whimpering	sustained cry	high-pitched
C. BEHAVIORAL RESPONSES				
RESPONSIVENESS	1		2	3
ALERTNESS	inattentive or brief responsiveness (4 or less)		moderately sustained alertness, may use stimulation to come to alert state (5,6)	sustained and continuous attentiveness (7-9)
ORIENTATION to face & voice	does not focus or follow stimulus, brief following (4 or less)		inconsistent or jerky following horizontal 30° (5,6)	sustained smooth following 60° horizontally and occasionally vertically (7-9)
DEFENSIVE REACTION to cloth over face	no response: nonspecific activity with long latency		rooting, head turning	swipes with arms
TEMPERAMENT	1 - flat	1 - labile	2	3
IRRITABILITY	no cry	cries to 6 stimuli	cries to 4 or 5 stimuli	cries to 1-3 stimuli
PEAK OF EXCITEMENT	low level of arousal never > state 3	insulated crying in response to stimuli	predominantly state 4, may reach state 5 with stimulation	predominantly state 5, reaches state 6 with stimulation
CUDDLINESS	no molding	resists, arches	molds with movement and handling	molds and nestles spontaneously
EQUILIBRATION	1		2	3
SELF-QUIETING	cannot self-quiet		occasional success, no sustained crying	quiets on two or more occasions
CONSOLABILITY	unconsolable		consoles with holding and rocking; consoling not needed	consoles with talking or handling in crib
TREMORS	tremors in all states		tremors occasionally with aversive stimuli	no tremors or tremors only with crying

การให้คะแนน

1. Total responses to the 9 items in each area; A scored as 1
2. Behavioral subtest scored 3, if 2 of three items are scored 3
3. Behavioral subtest scored 1, if 2 of three items are scored 1
4. Behavioral subtest scored 2, if neither or the above criteria are met
5. Score number of abnormal patterns

Total score…….

คู่มือลูกตัวน้อยของฉัน

“My Preemie Handbook”

จัดทำโดย
วารุณี มีหลาย
นิสิตหลักสูตรปริญญาเอก
คณะพยาบาลศาสตร์ มหาวิทยาลัยบูรพา

(สำหรับผู้ปกครอง)

คู่มือลูกตัวน้อยของฉัน

“My Preemie Handbook”

คู่มือฉบับนี้จัดทำขึ้นเพื่อให้บิดามารดาทารกคลอดก่อนกำหนดใช้เป็นแนวทางในการมีส่วนร่วมในการดูแลทารกเกิดก่อนกำหนดที่เข้ารับการรักษาในหอผู้ป่วยหนักทารกแรกเกิด เพื่อส่งเสริมการเจริญเติบโตและพัฒนาการของทารก รวมทั้งเสริมสร้างสมรรถนะในตนเองของบิดามารดาในการดูแลทารกคลอดก่อนกำหนด ทั้งนี้กิจกรรมการดูแลที่ทำโดยผู้ปกครองจะอยู่ภายใต้การดูแลของพยาบาล และเป็นกิจกรรมที่บิดามารดาสามารถทำได้และปลอดภัยต่อทารก

ผู้วิจัยหวังว่าคู่มือฉบับนี้จะเป็นประโยชน์กับบิดามารดาในการเป็นแนวทางดูแลทารกคลอดก่อนกำหนด

สารบัญ

วิธีการเลี้ยงลูกด้วยนมแม่

นมแม่เป็นอาหารที่ดีที่สุดสำหรับทารกเพราะมีสารอาหารครบถ้วน มีสัดส่วนที่เหมาะสมกับความต้องการของทารก ย่อยง่าย สะอาด สะดวก ปลอดภัย นมแม่ช่วยสร้างความผูกพันรักใคร่ระหว่างมารดากับทารก และช่วยเสริมสร้างภูมิต้านทานเชื้อโรคให้กับทารก

การปฏิบัติตัวของมารดาขณะเลี้ยงลูกด้วยนมแม่

1. พักผ่อนให้เพียงพอ
2. รับประทานอาหารที่มีประโยชน์ถูกหลักโภชนาการสำหรับหญิงระยะให้นมบุตร
3. งดเว้นของหมักดองหรือมีแอลกอฮอล์ปน เพื่อจะได้น้ำนมปริมาณเพียงพอและมีคุณค่าทางอาหาร
4. ห้ามรับประทานยาดองเหล้าเพราะมีส่วนผสมของแอลกอฮอล์ ซึ่งมีฤทธิ์ซึมผ่านทางน้ำนมได้
5. ดื่มน้ำมาก ๆ
6. ทำจิตใจให้สบาย
7. สามารถรับประทานอาหารที่ช่วยกระตุ้นการผลิตน้ำนมได้ เช่น หัวปลี ขิง พริกไทย กระเพรา กระชาย เป็นต้น หรือรับประทานอาหารประเภท แกงเลียง ผัดขิง น้ำขิง

การเก็บน้ำนมจากวิธีการบีบน้ำนมด้วยมือ

1. ล้างมือให้สะอาดทุกครั้งก่อนบีบน้ำนม
2. วางนิ้วหัวแม่มือบนลานนม นิ้วมืออื่น ๆ อยู่ตรงข้ามกดเข้าหาตัว ตามรูปด้านล่าง

3. บีบ คลาย กด บีบ คลายเป็นจังหวะตามรูปเพื่อรีดน้ำนมออกให้หมดกระเปาะ

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ระยะ	สื่อสัญญาณทารกที่แสดงออกถึงการหลับตื่น
2. **ระยะหลับลึกหรือหลับสนิท** เป็นระยะที่ร่างกายของทารกมีการเสริมสร้างซ่อมแซมส่วนที่สึกหรอและการสังเคราะห์พลังงานจากอาหาร ร่างกายมีการใช้ออกซิเจนลดลง มีการหลั่งของฮอร์โมนซีโรโทนินที่ช่วยในการเจริญเติบโตได้เพิ่มขึ้น 	▪ ใบหน้าผ่อนคลาย ▪ เปลือกตาปิดสนิท ▪ ไม่มีการเคลื่อนไหวของตา ▪ หายใจสม่ำเสมอ ▪ การเต้นของหัวใจสม่ำเสมอ ▪ ไม่มีการเคลื่อนไหวของร่างกายและใบหน้าอย่างตั้งใจ ▪ อาจจะมีอาการผวาหรือสะดุ้งบ้างแต่ไม่มาก ▪ ปลุกให้ตื่นยาก ▪ ไม่มีการตอบสนองต่อสิ่งกระตุ้นภายนอก
3. **ระยะง่วงซึม** เป็นช่วงต่อระหว่างการหลับกับการตื่น ซึ่งอาจเปลี่ยนจากการตื่นเป็นการหลับ หรือเปลี่ยนจากการหลับเป็นการตื่น	▪ ทารกจะแสดงอาการครึ่งหลับครึ่งตื่น ▪ ตาปรือ หนังตาหนัก มีการเปิดๆปิดๆของเปลือกตา ▪ ทารกแสดงอาการสงบนิ่งหรือมีการเคลื่อนไหว

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ระยะ	สื่อสัญญาณทารกที่แสดงออกถึงการหลับตื่น
	▪ ใบหน้ายิ้ม ทำหน้าย่น ขยับปากบ้าง ▪ ตอบสนองต่อสิ่งเร้าช้า ▪ อาจแสดงอาการหงุดหงิด
4. **ระยะตื่นสงบ** เป็นช่วงเวลาที่ทารกแสดงความสนใจต่อสิ่งแวดล้อม สามารถรับรู้ต่อสิ่งต่าง ๆ ได้ดี ซึ่งเหมาะต่อการมีปฏิสัมพันธ์กับทารก 	▪ เปลือกตาจะเปิดกว้าง ▪ ดวงตาสดใสเป็นประกาย ▪ สนใจต่อสิ่งแวดล้อมที่มากระตุ้นมากที่สุด เช่น วัตถุที่มีเสียง การได้ยินเสียงรอบ ๆ มีความสนใจสิ่งกระตุ้นการมองเห็น ▪ การเคลื่อนไหวของร่างกายยังมีน้อย ▪ ใบหน้าสดใสแสดงความสนใจ ▪ มีการตอบสนองต่อใบหน้าการอุ้มสัมผัสกอดรัด และ

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การโอบห่อทารกด้วยมือทำได้ดังนี้

1. ใช้มือข้างหนึ่งของบิดามารดาประคองแขนทั้งสองข้างของทารกให้งอเข้าหากึ่งกลางลำตัว
2. มืออีกข้างหนึ่งของบิดามารดาประคองขาทารกทั้งสองข้างให้งอเข้าหากึ่งกลางลำตัวโดยการใช้มือโอบห่อทารกตั้งแต่เริ่มทำหัตถการจนสิ้นสุดการทำหัตถการ และทารกอยู่ในอาการสงบหลังจากการทำหัตถการ
3. การจัดท่าของทารกขณะโอบห่อด้วยมือสามารถจัดให้อยู่ในท่านอนหงายหรือนอนตะแคงก็ได้

การห่อตัวทารก เป็นการจำกัดการเคลื่อนไหวร่างกาย ทำให้ทารกรู้สึกปลอดภัย ลดความเครียดและความปวด และทำให้ทารกนอนได้นานขึ้น นอกจากนี้การห่อตัวด้วยผ้าทำให้ทารกได้รับสัมผัสที่นุ่มนวลและอบอุ่นจากผ้าที่ใช้ห่อผ่านระบบประสาทรับความรู้สึก ช่วยลดความไม่สุขสบายและความเครียดของทารกจากการได้รับหัตถการที่คุกคามต่อร่างกายได้


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การห่อตัวทารกสามารถทำได้ดังนี้

1. จัดมือทั้งสองข้างของทารกอยู่ใกล้บริเวณใบหน้า และริมฝีปาก
2. จัดให้ขาทั้งสองข้างของทารกงอเข้าหาลำตัว และห่อตัวทารก ซึ่งการห่อตัวเป็นการจำกัดการเคลื่อนไหวของร่างกาย ช่วยลดการตอบสนองต่อความเจ็บปวดจากการทำหัตถการ เช่น การเจาะส้นเท้า ทำให้ อัตราการเต้นของหัวใจลดลง ค่าความอิ่มตัวของออกซิเจนเพิ่มขึ้น นอกจากนี้ยังช่วยส่งเสริมให้ทารกเข้าสู่ภาวะหลับได้ง่ายขึ้น และส่งเสริมให้ทารกปรับตัวเองเข้าสู่ภาวะสมดุลได้ดีขึ้น

ปลอบโยนทารกคลอดก่อนกำหนดด้วยการวางมือบนลำตัวและศีรษะของทารกอย่างนุ่มนวล ซึ่งเป็นวิธีหนึ่งในการบรรเทาความตึงเครียดที่ปลอดภัยสำหรับทารกคลอดก่อนกำหนดจากการได้รับหัตถการ การวางมือบนลำตัวและศีรษะของทารกอย่างนุ่มนวลทำให้ทารกรู้สึกผ่อนคลายและสบาย

คู่มือ
การดูแลพัฒนาการของทารกคลอดก่อนกำหนด
"Preemie Developmental Care Handbook"

จัดทำโดย

วารุณี มีหลาย

นิสิตหลักสูตรปริญญาเอก

คณะพยาบาลศาสตร์ มหาวิทยาลัยบูรพา

(สำหรับพยาบาล)

คู่มือการดูแลพัฒนาการของทารกคลอดก่อนกำหนด

"Preemie Developmental Care Handbook"

คู่มือฉบับนี้จัดทำขึ้นเพื่อให้พยาบาลใช้เป็นแนวทางในการดูแลทารกคลอดก่อนกำหนดที่เข้ารับการรักษาในหอผู้ป่วยทารกแรกเกิดวิกฤต เพื่อส่งเสริมการเจริญเติบโตและพัฒนาการของทารก รวมทั้งส่งเสริมการเสริมสร้างสมรรถนะในตนเองของผู้ปกครองในการดูแลทารกคลอดก่อนกำหนด

ผู้วิจัยหวังว่าคู่มือฉบับนี้จะเป็นประโยชน์กับพยาบาลในการใช้เป็นแนวทางดูแลพัฒนาการของทารกคลอดก่อนกำหนด

สารบัญ

แนวปฏิบัติสำหรับพยาบาลในการดูแลพัฒนาการของทารกคลอดก่อนกำหนด

การส่งเสริมการพักหลับ

1. ปฏิบัติกิจกรรมพยาบาลในขณะที่ทารกอยู่ในภาวะตื่น รบกวนทารกเท่าที่จำเป็น
2. การจัดชั่วโมงสงบในหอผู้ป่วยหนักทารกแรกเกิด โดยการตั้งเสียงสัญญาณเตือนของอุปกรณ์ทางการแพทย์ต่าง ๆ ให้อยู่ในระดับที่เบาและปิดไฟในหอผู้ป่วย จัดชั่วโมงสงบเวรละ 1 ครั้งๆ ละ 1-2 ชั่วโมง ดังนี้ 12.00-13.00, 21.00-22.00, 3.00-5.00 น.
3. บันทึกการหลับตื่นของทารกเวรละ 1 ครั้ง

การดูแลการให้อาหาร

4. ส่งเสริมการให้นมมารดากับทารกคลอดก่อนกำหนด
5. ดูแลให้ทารกได้รับสารน้ำสารอาหารอย่างเพียงพอ

การประเมินและการจัดการกับความเจ็บปวดและความเครียดของทารก

6. ประเมินความเจ็บปวดและ/หรือความเครียดของทารกก่อน ขณะและภายหลังการทำกิจกรรมการพยาบาลที่ก่อให้เกิดความเครียดหรือความเจ็บปวดทุกครั้ง
7. ทำกิจกรรมการพยาบาลเพื่อบรรเทาความเจ็บปวดและ/หรือความเครียดของทารกด้วยการห่อตัว หรือทำ Facilitated tucking หรือ Gentle human touch ทุกครั้งที่ทำหัตถการที่ก่อให้เกิดความเครียดและความปวด

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การจัดท่านอนและการจับต้องทารกคลอดก่อนกำหนด

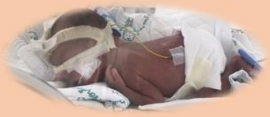
การจัดท่านอนทารกคลอดก่อนกำหนด ทารกคลอดก่อนกำหนดมีกล้ามเนื้อที่ยังไม่แข็งแรง ท่านอนของทารกจึงมีแขนขาแบะออก จึงควรจัดท่าทารกโดยให้แขนขางอเข้ากึ่งกลางลำตัว จัดให้มืออยู่ใกล้วิมฝีปาก (hand to mouth) และจัดท่านอนให้ทารกอยู่ในท่าที่ใกล้เคียงในครรภ์มากที่สุด โดยม้วนผ้าล้อมรอบตัวทารกให้ทารกนอนอยู่ในขอบเขตจำกัดเสมือนอยู่ในครรภ์มารดา (nest) เพื่อไม่ให้ข้อไหล่และข้อสะโพกหมุนออก เป็นการปลอบโยนตนเองให้ทารกสามารถปรับตัว เข้าสู่ภาวะสมดุล ทำให้ทารกอยู่ในภาวะสงบ ลดการใช้พลังงาน ส่งเสริมให้ทารกมีพัฒนาการที่ดีของกล้ามเนื้อและกระดูก และช่วยให้มีการจัดระบบประสาทส่วนกลางดีขึ้น

การจัดท่านอนทารกคลอดก่อนกำหนด สามารถทำได้ 3 ท่า ได้แก่

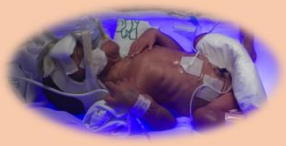
1. **ท่านอนคว่ำ** ในทารกที่ไม่ได้ใส่ท่อช่วยหายใจ การจัดท่านี้ในทารกคลอดก่อนหนดที่มีปัญหาในระบบทางเดินหายใจจะทำให้ระยะเวลาหลับนานขึ้นช่วยให้มีการหลั่งฮอร์โมนที่ใช้ในการเจริญเติบโตเพิ่มขึ้น เพราะระยะเวลาตื่นของทารกน้อยลงทำให้มีการใช้พลังงานน้อยลง ช่วยสนับสนุนการงอของแขนขา ป้องกันการหมุนและกางออกด้านนอกของสะโพก ทารกสามารถปลอบโยนตนเองได้ง่าย เกิดการสั่น สะดุ้ง ผวาน้อยลง ทำให้ปอดมีการขยายตัวมากขึ้น ซึ่งมีผลทำให้การแลกเปลี่ยนก๊าซดีขึ้น ระดับออกซิเจนในร่างกาย และค่าความอิ่มตัวของออกซิเจนในเลือดเพิ่มขึ้น ลดการเกิดภาวะกรดไหลย้อน แต่ควรระวังการเกิดภาวะหยุดหายใจในท่านอนคว่ำ

53

ดังนั้น ควรติดตามและประเมินการทำงานของระบบหายใจ ค่าความอิ่มตัวของออกซิเจนในเลือดเมื่อจัดให้ทารกอยู่ในท่านอนคว่ำ



2. **ท่านอนหงาย** การจัดท่านอนหงายจะลดความเสี่ยงของการเกิดการอุดกั้นทางเดินหายใจส่วนบนได้ สะดวกต่อการสังเกตอาการ การหายใจ สีผิว และการให้การพยาบาลรวมทั้งการทำหัตถการต่าง ๆ ให้กับทารก ช่วยลดการเกิดการแบนของศีรษะทางด้านข้าง แต่ท่านอนหงายจะทำให้ทารกเกิดการสะดุ้ง และผวาต่อเสียงได้ง่าย ทำให้ทารกตื่นได้ง่าย มีระยะร้องไห้ และหลับตื้นเพิ่มขึ้น ซึ่งมีผลทำให้ระยะเวลาในการนอนหลับของทารกลดลง



66

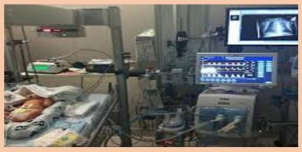
การปรับสิ่งแวดล้อมในหอผู้ป่วยให้เหมาะสมกับพัฒนาการของทารก

การปรับสิ่งแวดล้อมในหอผู้ป่วยให้เหมาะสมกับพัฒนาการของทารก (healing environment) เป็นการจัดสิ่งแวดล้อมทางกายภาพให้มีความเหมาะสมกับการดูแลเพื่อส่งเสริมพัฒนาการ มีรายละเอียดดังนี้

การจัดสภาพแวดล้อมให้เหมาะสมกับการดูแลเพื่อส่งเสริมพัฒนาการทารกคลอดก่อนกำหนด ประกอบด้วย

การจัดสิ่งแวดล้อมด้านแสง สามารถทำได้โดย

- จัดสภาพแสงในหอผู้ป่วยหนักทารกแรกเกิดให้เหมาะสมตามมาตรฐาน คือ 1-60 ฟุตแรงเทียน
- ปิดหลอดไฟที่ไม่จำเป็นต้องใช้
- ปรับระดับแสงไฟที่อยู่เหนือหัวเตียงให้เป็นแสงสลัว และไม่ควรให้ตาของทารกสัมผัสกับแสงโดยตรง



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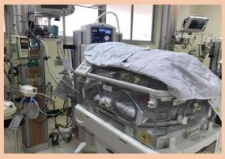
- คลุมตู้อบบางส่วนหรือทั้งหมดด้วยผ้าเพื่อลดความจ้าของแสง

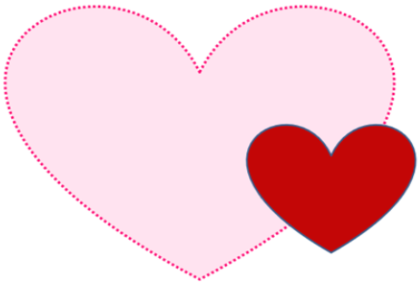


- มีการติดตั้งผ้าม่านเพื่อลดระดับความเข้มจากแสงอาทิตย์
- ส่งเสริมแบบแผนการหลับและตื่นของทารกให้มีการเปลี่ยนระยะหลับตื่นที่เหมาะสมโดยจัดให้มีความมืดความสว่างเป็นวงจรเหมือนเวลากลางวันกลางคืน (cycle light)

การจัดสิ่งแวดล้อมด้านเสียง สามารถทำได้โดย

- การจัดชั่วโมงสงบในหอผู้ป่วยหนักทารกแรกเกิด โดยการตั้งเสียงสัญญาณเตือนของอุปกรณ์ทางการแพทย์ต่าง ๆ ให้อยู่ในระดับที่เบาที่สุดเท่าที่จะทำได้ จัดชั่วโมงสงบเวรละ 1 ครั้งๆละ 1-2 ชั่วโมงดังนี้ 12.00-13.00, 21.00-22.00, 3.00-5.00น.
- ขณะทำหัตถการกับทารกต้องสื่อสารกันด้วยที่เสียงเบา
- ไม่เคาะตู้อบหรือวางสิ่งของไว้บนหลังตู้อบ
- เปิดปิดตู้อบอย่างเบามือเพื่อให้มีเสียงน้อยที่สุด

แผนรายวัน
ลูกตัวน้อยที่น่ารักของฉัน
"My Lovely Preemie" Daily Plan



จัดทำโดย
วารุณี มีหลาย
นิสิตหลักสูตรปริญญาเอก
คณะพยาบาลศาสตร์ มหาวิทยาลัยบูรพา

(สำหรับผู้ปกครอง)

ข้อมูลลูก

ชื่อลูก.....

ชื่อเล่น.....

วันที่เกิด.....เวลา.....น.

น้ำหนักแรกเกิด.....กรัม

ความยาว.....เซนติเมตร

รอบศีรษะ.....เซนติเมตร

อายุครรภ์ในวันที่เกิด.....สัปดาห์

บันทึกน้ำหนัก ความยาว และรอบศีรษะของลูก

วันที่	น้ำหนัก (กรัม)	ความยาว (เซนติเมตร)	รอบศีรษะ (เซนติเมตร)	หมายเหตุ
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28				

บันทึกการเยี่ยม

วันที่	จำนวน (ครั้ง)	เวลา	ระยะเวลา	หมายเหตุ
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บันทึกการบีบหรือปั๊มนมและปริมาณน้ำนม

วันที่ / ครั้งที่	ปริมาณน้ำนมที่บีบหรือปั๊ม										หมายเหตุ
	1	2	3	4	5	6	7	8	9	10	
1											
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บันทึกสื่อสัญญาณทารก

สื่อสัญญาณทารกที่สังเกตได้	ความหมาย	การตอบสนอง	หมายเหตุ

บันทึกสื่อสัญญาณทารก

สื่อสัญญาณทารกที่สังเกตได้	ความหมาย	การตอบสนอง	หมายเหตุ

วันที่ 1

กิจกรรมที่วางแผน	กิจกรรมที่ได้ปฏิบัติ	หมายเหตุ
สัมผัสมือหรือตัวลูก		
นวดสัมผัส		
ทำแกงการุ		
พูดคุยกับลูก		
อุ้มลูก		
ดูแลความสะอาดของช่องปาก		
เปลี่ยนผ้าอ้อม		
Feed นมลูก		
จัดท่านอนลูก		

บันทึกความรู้สึก

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แผนการดำเนินการวิจัย

เรื่อง

ประสิทธิผลของโปรแกรมการดูแลพัฒนาการของทารกคลอดก่อนกำหนดแบบเบ็ดเสร็จต่อการรับรู้สมรรถนะในตนเองของผู้ปกครองการเจริญเติบโต และพัฒนาการด้านประสาทพฤติกรรมของทารกคลอดก่อนกำหนดขณะรักษาตัวในโรงพยาบาล

(Effectiveness of Comprehensive Preterm Infant Developmental Care Program on parental self-efficacy, growth and neurobehavioral development of hospitalized preterm infants)

โดย

นางสาววารุณี มีหลาย

นิสิตหลักสูตรปรัชญาดุษฎีบัณฑิต สาขาพยาบาลศาสตร์

คณะพยาบาลศาสตร์ มหาวิทยาลัยบูรพา

แผนการดำเนินการวิจัย

เรื่อง ประสิทธิผลของโปรแกรมการดูแลพัฒนาการของทารกคลอดก่อนกำหนดแบบเบ็ดเสร็จต่อการรับรู้สมรรถนะในตนเองของผู้ปกครอง การเจริญเติบโต และพัฒนาการด้านประสาทพฤติกรรมของทารกคลอดก่อนกำหนดขณะรักษาตัวในโรงพยาบาล (Effectiveness of Comprehensive Preterm Infant Developmental Care Program on parental self-efficacy, growth and neurobehavioral development of hospitalized preterm infants)

โดย นางสาววารุณี มีหลาย นิสิตหลักสูตรปรัชญาดุษฎีบัณฑิต สาขาพยาบาลศาสตร์ คณะพยาบาลศาสตร์ มหาวิทยาลัยบูรพา

อาจารย์ผู้ควบคุมดุษฎีนิพนธ์ รองศาสตราจารย์ ดร.จินตนา วัชรสินธุ์ และ รองศาสตราจารย์ ดร.ภรภัทร เฮงอุดมทรัพย์

สำหรับ บิดามารดาของทารกเกิดก่อนกำหนดอายุ 28 – 32 สัปดาห์ที่เข้ารับการรักษาในหอผู้ป่วยทารกแรกเกิดวิกฤต โรงพยาบาลชลบุรี

วัตถุประสงค์

เพื่อส่งเสริมการเจริญเติบโตและพัฒนาการด้านประสาทพฤติกรรมของทารกคลอดก่อนกำหนดขณะรักษาตัวในโรงพยาบาล รวมทั้งเสริมสร้างสมรรถนะในตนเองของบิดามารดาในการดูแลทารกคลอดก่อนกำหนด

แผนการดำเนินการ

สำหรับกลุ่มควบคุม

กลุ่มควบคุมจะได้รับการดูแลตามปกติโดยพยาบาล มารดาจะได้รับการประเมินการรับรู้สมรรถนะในตนเองในการดูแลทารกคลอดก่อนกำหนดและทารกจะได้รับการประเมินการเจริญเติบโต และพัฒนาการด้านประสาทพฤติกรรมทั้งหมดรวม 3 ครั้ง คือ

1. ระยะก่อนการทดลองในวันที่ 0 (T1)
2. ระยะหลังการทดลองในวันที่ 14 (T2)
3. ระยะติดตามผลในวันที่ 28 (T3)

ภายหลังการประเมินผลครบทั้ง 3 ระยะแล้ว กลุ่มควบคุมจะได้รับคู่มือลูกตัวน้อยของฉัน “My Preemie Handbook” เพื่อใช้เป็นแนวทางในการดูแลทารกคลอดก่อนกำหนดต่อไป

สำหรับกลุ่มทดลอง

กลุ่มทดลองจะได้รับการดูแลตามปกติร่วมกับได้รับโปรแกรมการดูแลพัฒนาการของทารกคลอดก่อนกำหนดแบบเบ็ดเสร็จ โดยโปรแกรมการวิจัยนี้จะใช้เวลาทั้งหมด 4 ครั้ง ครั้งละ 60-90 นาที ภายใน 1 สัปดาห์ จำนวน 4 วัน มารดาจะได้รับการประเมินการรับรู้สมรรถนะในตนเองในการดูแลทารกคลอดก่อนกำหนดและทารกจะได้รับการประเมินการเจริญเติบโต และพัฒนาการด้านประสาทพฤติกรรม ทั้งหมดรวม 3 ครั้ง คือ

1. ระยะก่อนการทดลองในวันที่ 0 (T1)
2. ระยะหลังการทดลองในวันที่ 14 (T2)
3. ระยะติดตามผลในวันที่ 28 (T3)

คำอธิบายของโปรแกรมการดูแลพัฒนาการของทารกคลอดก่อนกำหนดแบบเบ็ดเสร็จ

โปรแกรมการดูแลพัฒนาการของทารกคลอดก่อนกำหนดแบบเบ็ดเสร็จ ประกอบด้วย 6 ระยะ ได้แก่ 1) การสร้างสัมพันธภาพ ความไว้วางใจและการตั้งเป้าหมาย 2) การทำความเข้าใจบริบทของบิดามารดาและทารกคลอดก่อนกำหนด 3) การฝึกสอน (coach) บิดามารดาให้พัฒนาสมรรถนะในตนเองในการดูแลทารกคลอดก่อนกำหนด 4) การส่งเสริมและสนับสนุนการดูแลพัฒนาการของทารก 5) การให้การดูแลด้านจิตสังคมแก่บิดามารดา และ 6) การสะท้อนความรู้สึกและการประเมินผล โดยโปรแกรมนี้จะใช้ระยะเวลาในการทำกิจกรรมใน 1 สัปดาห์ จำนวน 4 ครั้ง (session) ครอบคลุมทั้ง 6 ระยะ ดังรายละเอียดที่อธิบายไว้ในตารางด้านล่างนี้

ระยะ	วัตถุประสงค์	กิจกรรม	เครื่องมือ	เวลา	เหตุผลตามหลักการและทฤษฎี
ระยะที่ 1: การสร้างสัมพันธภาพ ความไว้วางใจและการตั้งเป้าหมาย	- สร้างสัมพันธภาพและความไว้วางใจระหว่างผู้วิจัยกับบิดามารดา -	1. ผู้วิจัยแนะนำตัวกับบิดาหรือมารดา 2. ผู้วิจัยอธิบายวัตถุประสงค์การวิจัยและรายละเอียดของโปรแกรม 3. ..... 4. ..... 5. ..... 6. ..... 7. ผู้วิจัยกล่าวคำชื่นชมบิดาหรือมารดาที่มาเข้าร่วมโครงการวิจัย		15 นาที	ระยะนี้เป็นการเริ่มต้นการติดต่อสื่อสารระหว่างผู้วิจัยกับบิดาหรือมารดาเพื่อสร้างความไว้วางใจ .... (Kowalski & Casper, 2007)

ระยะ	วัตถุประสงค์	กิจกรรม	เครื่องมือ	เวลา	เหตุผลตามหลักการและทฤษฎี
ระยะที่ 2: การทำความเข้าใจบริบทของบิดามารดาและทารกคลอดก่อนกำหนด	- เพื่อเข้าใจความคาดหวังและ ความต้องการของผู้ปกครอง รวมทั้งการอ่านสื่อสัญญาณทารก - …… - ……	1. ผู้วิจัยกระตุ้นให้บิดาหรือระบายความรู้สึกเกี่ยวกับการมีลูกคลอดก่อนกำหนด..... 2. …….. 3. ……..	- คู่มือลูกตัวน้อยของฉัน “My Preemie Handbook” - …… - ……	35 นาที	การได้ระบายความรู้สึกจะช่วยให้บิดามารดาเข้าใจความรู้สึก ..... (Kowalski & Casper, 2007)..... (Als, 1982)
ระยะที่ 3: การฝึกสอน (coach) บิดามารดาให้พัฒนาสมรรถนะในตนเองในการดูแลทารกคลอดก่อนกำหนด	- เพื่อเพิ่มพูนความรู้ของผู้ปกครองและสมรรถนะในตนเองของบิดาหรือมารดาในการดูแลทารกคลอดก่อนกำหนด	1. ผู้วิจัยบรรยายให้ความรู้กับบิดาหรือมารดาเรื่องของ การดูแลโภชนาการ การดูแลสิ่งแวดล้อม ..... 2…… 3……	- คู่มือลูกตัวน้อยของฉัน “My Preemie Handbook” - …… - ……	60 นาที	การให้ความรู้จะช่วยให้บิดาหรือมารดาเรียนรู้ .... (Altimier & Phillips, 2013; 2016)
ระยะที่ 4: การส่งเสริมและสนับสนุนการดูแล	- เพื่อเพิ่มพัฒนาการของพฤติกรรมทางระบบประสาทของทารกคลอดก่อน	ผู้วิจัยส่งเสริมการดูแลพัฒนาการทารกโดยการร่วมมือกับพยาบาลในหอผู้ป่วยทารกแรกเกิดวิกฤต เพื่อจัดกิจกรรมในการส่งเสริมพัฒนาการของทารก ได้แก่	- คู่มือการส่งเสริมพัฒนาการของทารกคลอดก่อนกำหนด	10 นาที	พยาบาลเป็นบุคคลสำคัญในการส่งเสริมการดูแลพัฒนาการทารกขณะรักษาตัวในโรงพยาบาล

ระยะ	วัตถุประสงค์	กิจกรรม	เครื่องมือ	เวลา	เหตุผลตามหลักการและทฤษฎี
พัฒนาการของทารก	กำหนด	- …….. - …….. - …….. - ……	“Preemie Developmental Care Handbook”		.... (Als, 1982; Altimier & Phillips, 2013; 2016)
ระยะที่ 5: การให้การดูแลด้านจิตสังคมแก่บิดามารดา	- เพื่อสนับสนุนผู้ปกครองให้มีส่วนร่วมในการดูแลทารกคลอดก่อนกำหนด	1. ผู้วิจัยร่วมวางแผนและกำหนดเวลาสำหรับบิดาหรือมารดาในการดูแลทารกและลดความเครียดของผู้ปกครอง 2. ……..	- คู่มือลูกตัวน้อยของฉัน “My Preemie Handbook” - ……	10 นาที	การคอยช่วยเหลือ อำนวยความสะดวกและสนับสนุนให้ผู้ปกครอง ..... (Benzies et al., 2013) .
ระยะที่ 6: การสะท้อนความรู้สึกและการประเมินผล	- เพื่อสะท้อนความรู้สึกและประเมินผลโครงการ	1. ผู้วิจัยเชิญชวนให้บิดาหรือมารดาสะท้อนความรู้สึก..... 2.....		10 นาที	การสะท้อนความรู้สึกและประเมินตัวเองจะช่วยให้ ..... (Kowalski & Casper, 2007)

รายละเอียดของโปรแกรมการดูแลพัฒนาการของทารกคลอดก่อนกำหนดแบบเบ็ดเสร็จ: ครั้งที่ 1

แผนการดำเนินการครั้งที่ 1 เรื่องการเตรียมผู้ปกครอง

สำหรับ บิดามารดาของทารกคลอดก่อนกำหนดอายุ 28 – 32 สัปดาห์ที่เข้ารับการรักษาในหอผู้ป่วยทารกแรกเกิดวิกฤต

สถานที่ หอผู้ป่วยทารกแรกเกิดวิกฤต โรงพยาบาลชลบุรี จำนวน 23 ราย (รายบุคคล)

วันที่ 1 หรือ 2 เวลา: 9.30-10.30 (60 นาที)

วัตถุประสงค์เฉพาะ	กิจกรรม	สื่อ/อุปกรณ์	เวลา	วิธีการประเมินผล	หมายเหตุ
เมื่อสิ้นสุดการให้ข้อมูล ผู้ปกครองทารกคลอดก่อนกำหนดสามารถ - สร้างสัมพันธภาพที่ดีกับผู้วิจัยได้ - ..... - ..... -	- ผู้วิจัยกล่าวทักทายและแนะนำตัวกับบิดาหรือมารดา - ผู้วิจัยอธิบายวัตถุประสงค์วิจัยและรายละเอียดของโปรแกรม - ผู้วิจัยให้ข้อมูลแก่บิดาหรือมารดาเกี่ยวกับสิ่งแวดล้อมและนโยบายของหอผู้ป่วยทารกแรกเกิดวิกฤต - ..... - ผู้วิจัยส่งเสริมการดูแลพัฒนาการทารกโดยการร่วมมือกับพยาบาลในหอผู้ป่วยทารกแรกเกิดวิกฤต เพื่อจัดกิจกรรมในการส่งเสริมพัฒนาการของทารก	- คู่มือ “ลูกตัวน้อยของฉัน” - แผนรายวัน “ลูกตัวน้อยที่น่ารักของฉัน” - ……. - ……. - ……. - …….	60 นาที	- ความสนใจและความตั้งใจในการรับฟังข้อมูลของบิดามารดา - ..... - ..... - ..... -	ครั้งนี้จะมุ่งเน้นระยะที่ 1, 2, และ 4

รายละเอียดของโปรแกรมการดูแลพัฒนาการของทารกคลอดก่อนกำหนดแบบเบ็ดเสร็จ: ครั้งที่ 2

แผนการดำเนินการครั้งที่ 2 เรื่องการดูแลสิ่งแวดล้อม และการดูแลด้านโภชนาการ

สำหรับ บิดามารดาของทารกคลอดก่อนกำหนดอายุ 28 – 32 สัปดาห์ที่เข้ารับการรักษาในหอผู้ป่วยทารกแรกเกิดวิกฤต

สถานที่ หอผู้ป่วยทารกแรกเกิดวิกฤต โรงพยาบาลชลบุรี จำนวน 23 ราย (รายบุคคล)

วันที่ 3 **เวลา** 09.00-10.30 (90 นาที)

วัตถุประสงค์เฉพาะ	กิจกรรม	สื่อการสอน	เวลา	วิธีการประเมินผล	หมายเหตุ
เมื่อสิ้นสุดการให้ข้อมูล ผู้ปกครองทารกคลอดก่อนกำหนดสามารถ - บอกประโยชน์ของการดูแลสิ่งแวดล้อม	- ผู้วิจัยกล่าวทักทายผู้ปกครอง - ผู้วิจัยบรรยายเกี่ยวกับการดูแลสิ่งแวดล้อมและการดูแลด้านโภชนาการ - ..... - ..... - ผู้วิจัยส่งเสริมการดูแลพัฒนาการทารกโดยการร่วมมือกับพยาบาลในหอผู้ป่วยทารกแรกเกิดวิกฤตเพื่อจัดกิจกรรมในการส่งเสริมพัฒนาการของทารก	- คู่มือลูกตัวน้อยของฉัน “My Preemie Handbook” - ..... - ..... - ..... - ..... - ..... -	90 นาที	- ความสนใจและความตั้งใจในการรับฟังข้อมูลของบิดามารดา - ..... - ..... - ..... -	ครั้งนี้มุ่งเน้นระยะที่ 3- 6

รายละเอียดของโปรแกรมการดูแลพัฒนาการของทารกคลอดก่อนกำหนดแบบเบ็ดเสร็จ: ครั้งที่ 3

แผนการให้ความรู้ครั้งที่ 3 เรื่องการส่งเสริมการนอนหลับในทารกคลอดก่อนกำหนด และการจัดท่าและการทำกิจกรรมกับทารก

ผู้รับการสอน บิดามารดาของทารกคลอดก่อนกำหนดอายุ 28 – 32 สัปดาห์ที่เข้ารับการรักษาในหอผู้ป่วยทารกแรกเกิดวิกฤต

สถานที่ หอผู้ป่วยทารกแรกเกิดวิกฤต โรงพยาบาลชลบุรี จำนวน 23 ราย (รายบุคคล)

วันที่ 5 **เวลา** 09.00-10.30 (90 นาที)

วัตถุประสงค์เฉพาะ	กิจกรรม	สื่อการสอน	เวลา	วิธีการประเมินผล	หมายเหตุ
เมื่อสิ้นสุดการให้ข้อมูล ผู้ปกครองทารกคลอดก่อนกำหนดสามารถ - บอกประโยชน์ของการส่งเสริมการนอนหลับในทารกคลอดก่อนกำหนด การจัดท่า	- ผู้วิจัยกล่าวทักทายบิดาหรือมารดา - ผู้วิจัยบรรยายเกี่ยวกับการส่งเสริมการนอนหลับในทารกเกิดคลอดก่อนกำหนด การจัดท่าและการทำกิจกรรมกับทารก -…… - …… - ผู้วิจัยส่งเสริมการดูแลพัฒนาการทารกโดยการร่วมมือกับพยาบาลในหอผู้ป่วยทารกแรกเกิดวิกฤตเพื่อจัดกิจกรรมในการส่งเสริมพัฒนาการของทารก	- คู่มือลูกตัวน้อยของฉัน “My Preemie Handbook” - ..... - ..... - ..... - ..... -	90 นาที	- ความสนใจและความตั้งใจในการรับฟังข้อมูลของบิดามารดา - ..... - ..... - ..... -	ครั้งนี้มุ่งเน้นระยะที่ 3 - 6

รายละเอียดของโปรแกรมการดูแลพัฒนาการของทารกคลอดก่อนกำหนดแบบเบ็ดเสร็จ: ครั้งที่ 4

แผนการดำเนินการครั้งที่ 4 เรื่องการลดภาวะเครียดและความปวดและการดูแลผิวหนังในทารกคลอดก่อนกำหนด

สำหรับ บิดามารดาของทารกคลอดก่อนกำหนดอายุ 28 – 32 สัปดาห์ที่เข้ารับการรักษาในหอผู้ป่วยทารกแรกเกิดวิกฤต

สถานที่ หอผู้ป่วยทารกแรกเกิดวิกฤต โรงพยาบาลชลบุรี จำนวน 23 ราย (รายบุคคล)

วันที่ 7 **เวลา** 09.00-10.30 (90 นาที)

วัตถุประสงค์เฉพาะ	กิจกรรม	สื่อการสอน	เวลา	วิธีการประเมินผล	หมายเหตุ
เมื่อสิ้นสุดการให้ข้อมูล ผู้ปกครองทารกคลอดก่อนกำหนดสามารถ - บอกประโยชน์ของการลดความเครียดและความปวด	- ผู้วิจัยกล่าวทักทายบิดาหรือมารดา - ผู้วิจัยบรรยายให้ความรู้เกี่ยวกับการลดความเครียดและความปวด และการดูแลผิวหนังในทารกคลอดก่อนกำหนด..... -…….. - ……. - ผู้วิจัยส่งเสริมการดูแลพัฒนาการทารกโดยการร่วมมือกับพยาบาล	- คู่มือลูกตัวน้อยของฉัน “My Preemie Handbook” - ..... - ..... - ..... - ..... -	90 นาที	- ความสนใจและความตั้งใจในการรับฟังข้อมูลของบิดามารดา - ..... - ..... -	ครั้งนี้มุ่งเน้นระยะที่ 3 - 6

ทั้งนี้กิจกรรมต่าง ๆ ในแต่ละ session สามารถปรับหรือสลับได้เพื่อให้สอดคล้องกับปัญหาและภาวะสุขภาพของทารก

หมายเหตุ

เพื่อให้เป็นไปตามมาตรการควบคุมและป้องกันการแพร่กระจายของโรคติดเชื้อไวรัสโคโรนา 2019 (COVID-19) กรมควบคุมโรค กระทรวงสาธารณสุข ผู้วิจัยได้ดำเนินการดังนี้

1. ดูแลให้กลุ่มตัวอย่างสวมหน้ากากอนามัยทุกครั้งที่เข้าร่วมกิจกรรม หากกลุ่มตัวอย่างไม่ได้นำหน้ากากอนามัยมาด้วยผู้วิจัยจะเป็นผู้จัดหาให้
2. ตรวจวัดอุณหภูมิเพื่อประเมินภาวะไข้ ก่อนเข้าร่วมกิจกรรม หากกลุ่มตัวอย่างมีไข้ หรือมีอาการอื่น เช่น ไอ หรือหายใจหอบเหนื่อย ผู้วิจัยจะให้งดการเข้าร่วมกิจกรรมและแนะนำให้ไปพบแพทย์
3. ให้กลุ่มตัวอย่างล้างมือด้วยเจลแอลกอฮอล์หรือน้ำสบู่ก่อนเข้าร่วมกิจกรรมและสามารถล้างมือด้วยเจลแอลกอฮอล์ในระหว่างเข้าร่วมกิจกรรมได้ตลอดเวลา ตามความต้องการ
4. เว้นระยะห่างระหว่างผู้วิจัยและกลุ่มตัวอย่างและเว้นระยะห่างระหว่างบุคคลตามหลักการเว้นระยะห่างทางสังคม (Social Distancing) ตลอดเวลา และให้นั่งเก้าอี้ตัวเว้นตัวโดยมีการทำสัญลักษณ์ไว้
5. ทำความสะอาดอุปกรณ์และสถานที่ในการจัดกิจกรรมด้วยน้ำยาฆ่าเชื้อ ทั้งก่อนและหลังทำกิจกรรม

BIOGRAPHY

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