

**THE EFFECTS OF SUPPORTIVE-EDUCATIVE NURSING
SYSTEM ON MOTHERS' DEPENDENT-CARE AGENCY,
GROWTH, DEVELOPMENT AND TEMPERAMENT
OF PREMATURE INFANTS**

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**A THESIS SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR
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ABSTRACT

The purpose of this quasi-experimental research was to determine the effects of supportive-educative nursing system on mothers' dependent-care agency growth, development and temperament of premature infants. Orem's theory was used as the conceptual framework for this study. The purposive sampling was 54 cases of mother and premature infants in the Premature Infant Unit and follow up at Outpatient department of Pediatrics at Queen Sirikit National Institute of Child Health and Bangkok Metropolitan administration Medical college and Vachira Hospital during September 2000-April 2001. They were divided into two groups, control (n = 28) and experimental (n = 26). The control group received only usual nursing care, but the experimental group received both usual nursing care and a supportive-educative nursing system provided by the researcher according to the supportive-educative nursing system plan and the handbook. Instruments were personal data forms, the mother's dependent-care agency questionnaire, growth and development assessment form, and infant temperament questionnaires. Data were analyzed using descriptive statistics, grouped t-test and Chi-square test.

The result showed that at 14 weeks after discharge the mean of dependent-care agency scores in the experimental group was significantly higher than the control group ($p < .01$) and the experimental group had significantly higher growth, proper development and higher infant temperament scores ($p < .01$, $p < .05$ and $p < .01$ respectively) than the control group.

The findings revealed that supportive-educative nursing system could develop mothers' ability to care for their premature infants and gave guidance for effective practice of nursing care.

KEY WORDS : DEPENDENT-CARE AGENCY/ SUPPORTIVE-EDUCATIVE NURSING SYSTEM/ GROWTH/ DEVELOPMENT/ TEMPERAMENT.

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ผลของการพยาบาลระบบสนับสนุนและให้ความรู้ ต่อความสามารถของมารดาในการดูแลทารก
การเจริญเติบโต พัฒนาการและพื้นฐานทางอารมณ์ของทารกเกิดก่อนกำหนด (THE EFFECTS OF
SUPPORTIVE-EDUCATIVE NURSING SYSTEM ON MOTHERS' DEPENDENT-CARE
AGENCY, GROWTH, DEVELOPMENT AND TEMPERAMENT OF PREMATURE
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บทคัดย่อ

การศึกษาครั้งนี้ เป็นการวิจัยกึ่งทดลอง เพื่อศึกษาผลของการพยาบาลระบบสนับสนุนและให้ความรู้
ต่อความสามารถของมารดาในการดูแลทารก การเจริญเติบโต พัฒนาการและพื้นฐานทางอารมณ์ของทารกเกิด
ก่อนกำหนด โดยใช้ทฤษฎีการพยาบาลของโอเร็มเป็นแนวทางในการศึกษา คัดเลือกกลุ่มตัวอย่างแบบเจาะจง
จำนวน 54 ราย เป็นมารดาและทารกเกิดก่อนกำหนดในหอผู้ป่วยทารกเกิดก่อนกำหนดและมารับการตรวจสุขภาพตาม
นัดที่ตึกผู้ป่วยนอกกุมารเวชศาสตร์ ของสถาบันสุขภาพเด็กแห่งชาติมหาราชินี และวิทยาลัยแพทยศาสตร์
กรุงเทพมหานคร และวชิรพยาบาล ระหว่างเดือนกันยายน 2543- เมษายน 2544 โดยแบ่งเป็น 2 กลุ่ม กลุ่มควบคุม
จำนวน 28 ราย กลุ่มทดลองจำนวน 26 ราย กลุ่มควบคุมได้รับการพยาบาลตามปกติ ส่วนกลุ่มทดลองได้รับการ
พยาบาลตามปกติร่วมกับได้รับการพยาบาลระบบสนับสนุนและให้ความรู้โดยผู้วิจัย โดยมีแผนการพยาบาลระบบ
สนับสนุนและให้ความรู้และคู่มือการดูแลทารกเกิดก่อนกำหนด เป็นแนวทางในการให้การพยาบาล เก็บรวบรวม
ข้อมูลโดยใช้แบบบันทึกข้อมูลส่วนบุคคลของมารดาและทารกเกิดก่อนกำหนด แบบวัดความสามารถของมารดา
ในการดูแลทารก แบบประเมินการเจริญเติบโต และพัฒนาการของทารก แบบวัดลักษณะพื้นฐานทางอารมณ์ของ
ทารก วิเคราะห์ข้อมูลโดยใช้สถิติแบบบรรยาย t-test และ χ^2 -test

ผลการวิจัยพบว่า เมื่อสิ้นสุดการศึกษา 14 อาทิตย์ หลังจำหน่ายกลับบ้าน กลุ่มทดลองมีคะแนนเฉลี่ย
ความสามารถของมารดาในการดูแลทารกสูงกว่ากลุ่มควบคุมอย่างมีนัยสำคัญทางสถิติ ($p < .01$) และทารกในกลุ่ม
ทดลองมีอัตราการเจริญเติบโตสูงกว่า มีพัฒนาการเหมาะสมมากกว่า และมีคะแนนลักษณะพื้นฐานทางอารมณ์
ของทารกสูงกว่ากลุ่มควบคุมอย่างมีนัยสำคัญทางสถิติ ($p < .01$, $p < .05$ และ $p < .01$ ตามลำดับ)

ดังนั้น จึงควรนำระบบการพยาบาลระบบสนับสนุนและให้ความรู้ไปใช้เป็นแนวทางในการพัฒนา
ความสามารถของมารดาในการดูแลทารก และเพื่อเพิ่มประสิทธิภาพในการให้การพยาบาลต่อไป

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CHAPTER I

INTRODUCTION

Background and Rationale

Premature infants are a high risk group for many complications and illnesses in initial births due to their mothers being delivered before 37 weeks of gestational age from the first day of the last menstrual period or by applying Ballard's method of assessing gestational age. A premature birth results in premature infants having immature organs and their body weights less than 2500 grams. (Praputh Siripun, B.E. 2533: 8) According to the statistics in Thailand infants classified into newborn weight between 500-2,500 grams were found 8.62% in 1998 and 8.46% in 1999 compared with stillbirth infants in state hospitals (Public Health Record of the Fiscal Year 1998-1999, Health Promoting-office, Health Department, Ministry of Public Health). The researcher's survey in premature infants at the Premature infant Unit, Queen Sirikit National Institute of Child Health, Department of Medical service, Ministry of Public Health, Bangkok, Thailand found that 25-30 premature infants were admitted each month while the number of them, according to Bangkok Metropolitan administration Medical College and Vachira hospital is about 25-30 per month.

Nowadays, the survival of premature infants has dramatically increased because of advanced biomedical technology and improved neonatal intensive care (Anun Techavej, B.E. 2539: 2; Blackburn, 1995: 43; Hamelin, 1997: 35). However, they often experience continuing health problems after discharge due to immature organs after birth. These problems are Bronchopulmonary dysplasia, Retinopathy of prematurity, hearing loss, hydrocephalus, short bowel syndrome, umbilical and inguinal hernias and infectious disorders (Ballard & Bernbaum, 1996: 260-263; Buehler, et.al., 1995: 93; Dusick, 1997: 169). It is found that the risk of health problems increase with decreasing gestational age and birth weight (Blackburn, 1995:

43). The chance that premature infants are more likely to require readmittance at least twice during the first 6-12 months of life. In addition preterm infants are at risk for delay growth and development, behavior problems, poor adaptation and difficult temperament. They are facing risk factors after birth which include the NICU environment and the caring method under nursing and medical treatments, the home environment and the unsuitable caring method from their mothers. (Crowley, 1993: 1057; Krebs, 1998: 39; Lane, 1993: 399; Miles, 1997: 257). The study of Barnard (1990, cited by Crowley, 1993: 1097) find that the problem of difficult temperament of premature infants is related to lower birthweight infant and health problems, specifically respiratory problems, besides related to the characteristics and emotion of their mothers, and infants' environment in their homes. (Chapieski & Evankovich, 1997: 225). These conditions impact on mothers, the families, and of course, affect the infants' quality of life (Dusick, 1997: 164)

The birth of premature infants represent stress for the mothers and their families. The reasons are result of various factors which are the mothers do not anticipate premature deliveries, premature birth dispossess them of their expected hope for the healthy infants, mothers are afraid that their infants might be dead earlier, and they often feel anxiety that they are not able to play the perfect maternal role. (Brooten, 1988: 213; Crowley, 1993: 1059; Miles, 1997: 229; Waley & Wong's 1999: 419-420). Because premature infants were separated from their mothers after birth immediately, they needed to receive special care in neonatal intensive care unit. The infant's appearance includes, immature organs, weak appearance of the infant. When they see the treatment and medical instruments to be used with the infants, the mothers become obsessed with uncertainty and more anxieties (Crowley, 1993: 1059). Several studies (Brooten, 1988: 213; Ladden, 1990: 620; Mc.Kim, 1993: 89) reported that parents of premature infants faced times of high levels of stress and loss of self confidence to provide care for the infants at the periods immediately following birth, prior to hospital discharge and the early post discharge period at home. According they were separated and did not participator practice in caring their infants during their stay in the hospital. The mothers often feel lack of self confidence and they may not be able to care for their small and fragile infant by themselves at their home. (Brooten, et. al., 1988: 317; Censullo, 1986: 146; Cusson, 1993: 63). Therefore, they

need information, knowledge and skills in routine daily care of their infants. They need to learn typical characteristics and behavior of premature infants such as feeding, sleeping, waking, crying and the facts about their infants' health problems, proper growth and development, and proper response to infants' need (Gennaro, 1990: 462; Jutarat Mesukko, B.E. 2540: 159-160; Ladden, 1990: 621; Mc. Cain, 1990: 103;)

So, the nurse's responsibilities were to provide nursing intervention to decrease stress in mothers, at the same time to enhance knowledge, skill and develop dependent care agency for the mothers to care their infants. The nurses' role were to assess the need and the problems of the mothers to plan the efficient discharge planning. The plan will meet mothers' need and can enhance mothers' dependent care agency to care for the premature infants with sufficient and continuous support (Harrison, 1986: 165; Mc. Kim, 1993: 94; Rauh, 1990: 32).

In this study, the researcher has studied and adopted Orem's theory of a supportive-educative nursing system to be the guidelines for providing nursing intervention to the discharge planning process and to develop mothers' dependent care agency to care for premature infants with sufficient and continuous support. By this system the mother can action care of her infant in order to accomplish her objective in therapeutic self-care demand of her infant and to enhance maximum potentiality of the infant. The infant has proper growth, development, temperament and good quality of life in prolonging life.

Theoretical Framework

This study used Orem's nursing theory of self care as the guideline for the study of dependent-care agency through the method of a supportive educative nursing system.

Orem's nursing theory stated that self-care is the practice of activities that individuals initiate and perform on their own behalf in maintaining life, health and well being (Orem, 1991: 117). The idea consists of a particular kind of deliberate action that mature and maturing persons, who have developed the capabilities to take care of themselves in their environmental situation. Persons who engage in self care have the requisite action capabilities, which can be seen as the agency or power to act deliberately to regulate factors that affect their own functioning and development

(Orem, 1991: 117). Normally, infants require support related to self care activities as they are in the early stages of development physically, psychologically and psychosocially (Orem, 1991: 117). They are dependent on their parents and family as providers of therapeutic self care demand in both physiological and psychological requisites. The dependent care agency can be compared to self-care, but with the purpose replacing to responding to the person for whom they are responsible. If the actions are carefully performed, they will give the highest performance level to structure, function and development (Orem, 1995: 104).

The birth of premature infants mean their mothers feel anxiety, unhappiness, guilt, failure, disappointment, fear and loss of self-confidence and self-esteem because they are not prepared to face this fear and they are separated from the infant (Brooten, 1988: 317; Censello, 1986: 146; Miles, & Davis, 1997: 255). The mothers express fear and feeling of inadequacy about their ability to care for their infants and desire more information, instruction, and help in caring for their infant at home (Gennaro, 1990: 97). Therefore it is the nurse who can help mothers to reduce their anxiety, give information, skill, knowledge in order to develop dependent care agency to care for their infants with confidence (Crowley, 1993: 1061). As a result, the supportive-educative nursing system of Orem's theory is the most efficient method.

Orem's theory has focused on self care agency compare to dependent care agency. The nursing system is the activity performed using nursing agency to adjust and remedy the balance between mothers' dependent-care agency and therapeutic self-care demand of the premature infants. Therapeutic self-care demand for persons consists of self care requisites 3 sides (Orem, 1991: 121) namely 1) Universal self-care requisites 2) Developmental self-care requisites and 3) Health deviation self-care requisites. While dependent-care agency is the capability responding to other persons requisites. Orem (1995: 242) has defined capabilities in infant care as a characteristic of dependent-care agency, as "The complex acquired ability to incorporate knowing and meeting health-deviation self-care requisites of infants and needed adjustments in universal and developmental self-care requisites into ongoing systems of infant care and parenting activities" (Orem, 1995: 242) and remain as capabilities to adjust and

develop dependent-care agency. The dependent-care agency structure has 3 levels included as the following (Orem, 1991: 148-155)

1. Capabilities for dependent-care operations: the three necessary capabilities those are significant and directly related to the methods to be applied to the premature infants immediately, as deliberate action and goal-orientation, as following:

1.1 Estimative capability is the ability to examining one's internal situations and major environments for the premature infant's care including the requisites in adaptability.

1.2 Transitional capability is the ability to make decisions related to the actions that will meet with therapeutic dependent-care demand.

1.3 Productive operation is the ability to perform activities in response to therapeutic self-care requisites.

2. Ten power component of dependent-care agency: which can be compared as a medium between perception and the action of the mother as specifically as a deliberate action for premature infant care, as follows: (Orem, 1991: 155)

2.1 Ability to maintain attention and exercise requisite with respect to dependent-care agent and internal and external conditions and factors significant for dependent-care

2.2 Controlled use of available physical energy that is sufficient for the initiation and continuation of dependent-care operations.

2.3 Ability to control the position of the body and its part in the execution of the movements required for the initiation and completion of dependent-care operations.

2.4 Ability to reason within a dependent-care frame of reference.

2.5 Motivation e.g., goal orientations for the premature infant care that are in accord with its characteristics and its meaning for life, health, and well-being.

2.6 Abilities to make decisions about care of the premature infant and to operationalize these decisions.

2.7 Abilities to acquire technical knowledge about the premature infant's care from authoritative sources, to retain it, and to operationalize it.

2.8 A repertoire of cognitive, perceptual, manipulative, communication and interpersonal skills adapted to the performance of the premature infant's care operations.

2.9 Ability to order discrete the premature infant's care actions or action systems into relationships with prior and subsequent actions toward the final achievement of regulatory goals of the premature infant care.

2.10 Ability to consistently perform the premature infant's care operations, integrating them with relevant aspects of personal, family and community living.

3. Foundational capabilities and dispositions: The mother capability to knowing, doing and seek the target of an activity which is ability and skill in learning, acknowledgement of external and internal events, self-value attention, self-understanding, concern and self-submission and ability in arranging priorities and time management for activities.

The estimate of dependent care agency of the mother should be done to meet therapeutic dependent-care demand for judged dependent-care deficit. So, the dependent-care deficit happened when the therapeutic dependent-care demand of the premature infant was more than dependent-care agency of the mother. The nursing system is required if there is the dependent care deficit. The nursing system, designed by the nurse, will be acted when the nurse communicate with the mother to seek problems and dependent-care demand and perform such actions in response to the therapeutic self-care demand of the premature infants, and includes developing dependent-care agency of the mother to respond to the premature infant care according to the nursing process.

Orem (1995: 306-311) has identified three classification of nursing systems by the types of caring: 1) the wholly compensatory nursing system, 2) the partly compensatory nursing system, 3) the supportive-educative nursing system.

The supportive-educative nursing system is recommended for situations to develop mothers' dependent-care agency to adequately respond with therapeutic self-care demand of the premature infants. The technique in this system include, as follows (Orem, 1995: 15-19).

1. Teaching method is a valid method of developing capabilities, knowledge and skills of the mother to caring for their premature infant.

2. Guiding in order to help the mother to make a suitable decision, to find resource for the premature infant's care, The guidance given must be appropriate, whether in the form of suggestions, instruction, direction or supervision (Orem, 1995: 16-17). Guiding another on a regular basis is used in conjunction with supporting another.

3. Supporting another person mean to sustain in an effort and thereby prevent the mother from failing or from avoiding an unpleasant situation or decision. Supporting is designed to help create the mother's confidence to be able to perform caring activities continually. The nurse's role is giving moral support with words, actions and in providing support in healing the mother's grief and arranging the environment to supplement the developing dependent-care agency of the mother.

4. Providing a developmental environment requires the helper to provide environmental conditions and helps to enable the mother to develop dependent-care agency as means to add a motive in setting a suitable goal, to adjust behavioral action to achieve the goal including adapting attitude, self conception and valuing premature infant care.

In order to the significance of the problems, this study used the supportive-educative nursing system of Orem's theory as a beneficial guideline to create the supportive-educative nursing system plan which to reduce anxiety, to increase skill, knowledge and self-confidence, to develop dependent care agency in the mothers to meeting with proper growth, development and temperament of the premature infants through activities that respond all the premature infants' therapeutic self-care demand sufficiently.

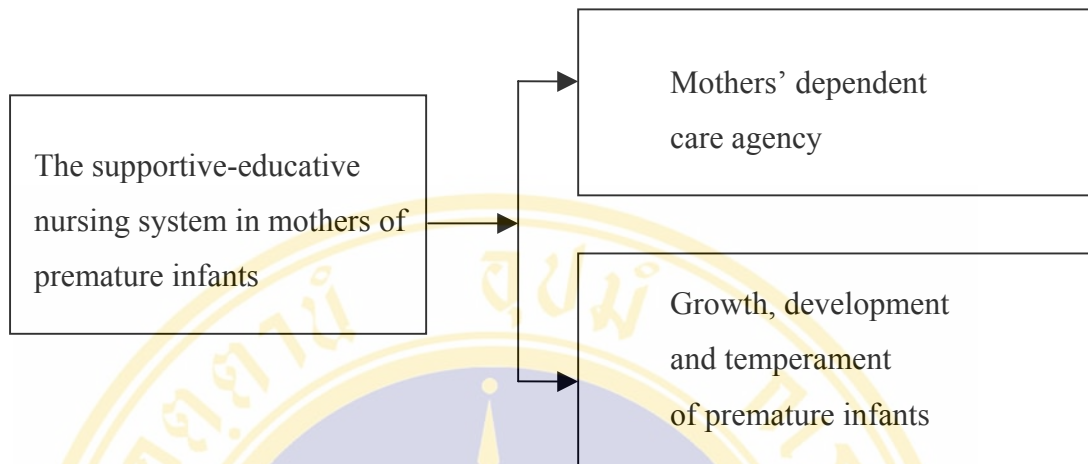


Figure I The relationship among variables in this study.

In this study, there are two groups of mothers and their premature infants, a control group, the mothers received usual nursing care versus an experimental group, the mothers received supportive-educative nursing system and usual nursing care.

Research Question

1. What is the difference between the dependent care agency of the mothers scores in the experimental group and the control group at 14 weeks after discharge?
2. What is the difference between growth, development and temperament of the premature infants in the experimental group and the control group at 14 weeks after discharge?

Objectives

1. To compare the dependent care agency of the mother scores between the experimental and the control groups at 14 weeks after discharge.
2. To compare growth, development and temperament of the premature infants between the experimental and the control groups at 14 weeks after discharge.

Research Hypothesis

1. The experimental group will have the dependent-care agency of the mother scores higher than the control group at 14 weeks after discharge.
2. The experimental group will have the growth, development and temperament of premature infants better than the control group at 14 weeks after discharge.

Scope of Research

The purpose of this quasi-experimental research was to study the effect of supportive-educative nursing system on mothers' dependent-care agency, growth, development and temperament of premature infants. The sampling groups are mothers and their premature infants from the Premature Infant Unit and Outpatient department of Pediatrics at Queen Sirikit national Institute of child health and Bangkok metropolitan administration Medical college and Vachira hospital during September 2000 to April 2001. The samples were divided into two groups with 26 cases was the experimental and 28 cases was the control groups.

Benefits of research

1. To increase dependent-care agency of the mothers to have self-confidence, knowledge, skill to care their premature infants with sufficient and continuous support in order to their have proper growth, development and temperament and good quality of life in prolonging life.
2. To be a guideline for the nurse in using the supportive-educative nursing system to develop the quality of nursing intervention to assess dependent-care agency of the mother and increase knowledge, skill and improve mothers' competence to care their infants properly after discharge.

Definition of Variables

Supportive-educative nursing system means the nursing activities that the researcher has arranged for the mothers individually to enhance their capabilities to care their infants after discharge. This is based on Orem's theory by including the combination of teaching, guidance, support and provision of a developmental environment. The goals benefited the mother to enable them to solve problems suitably as well as increase skill, knowledge and capabilities to care for their infant after discharge. This is provided to the experimental group besides usual nursing care which included activities as follows:

1. Create a relationship between the mother and the researcher, at the same time evaluate demands and problems as well as designate goals together.
2. Giving knowledge to the mother individually according to the nursing intervention plan to develop dependent-care agency of the mother of the premature infant before discharge, which was invented by researcher.
3. Guiding and supporting is the encouraging part that will reinforce mother's confidence by practising the skills and decision making the premature infant care by herself, providing suggestions, empowerment as well as to direct resources.
4. Managing environmental conditions is a means to promote dependent-care agency by offering mutual meeting between group of mothers about 2-3 persons so as to exchange experience and solve problems. Besides, the researcher follows the mother to assess problems and demands after discharge at home by telephone and appointments to follow-up at 2, 6 and 14 weeks after discharge.

Usual nursing care : means the nursing activities by the nurses given to the mothers at Premature infant unit and Outpatient department of Pediatrics at Queen Sirikit National Institute of Child Health and Bangkok Metropolitan administration Medical College and Vachira Hospital.

Mothers' dependent-care agency: means the mothers' activity in premature infants care for responding to the therapeutic self-care demands of the premature infants to maintain structure, function, development and health and well-being. This study was evaluated by a questionnaire that the researcher has adapted from the Appraisal on self-care agency of the fathers and mothers of the children 0-5 years by Manee Kuprasit (B.E.2539) as adapted from the Appraisal self-care scale:

Form A of Evers and others (1986) translated into Thai by Somchit Hanucharurnkul (B.E. 2532). The higher scores mean greater agency.

Growth: means the changes of physiology, the increase of bodyweight and size, proportion of body length and head circumference. The measurement is done on the follow-up day after infant discharge at 14 weeks.

The measurements include: body weight, body length and head circumference.

1. Body weight: means the weight of infant, to be measured in grams by taking all clothes off the infant with the body weight measurement in grams.
2. Body length: means the length of infant from the head to heel, to be measured in centimeters by having the infant lying down flat with straight legs and the foot's sole perpendicular to the floor on a scale platform for the body length of the infant.
3. Head circumference: means the length from the infant's forehead to prominent part of the occiput, to be measured in centimeters by placing a tape measure securely around the fullest part of the caput, from the middle of the forehead to the prominent part of the occiput.

Development : means the changes of form, function and maturity of the organs, including doing something more difficult and complex, increasing new skills and ability to adapt to the environment. It is assessed by Denver II (Denver Developmental Screening test) on the follow-up day after infant discharge at 14 weeks. It assesses development of the infant with items in four categories: 1) Personal-social 2) Fine Motor-Adaptive 3) Gross Motor 4) Language.

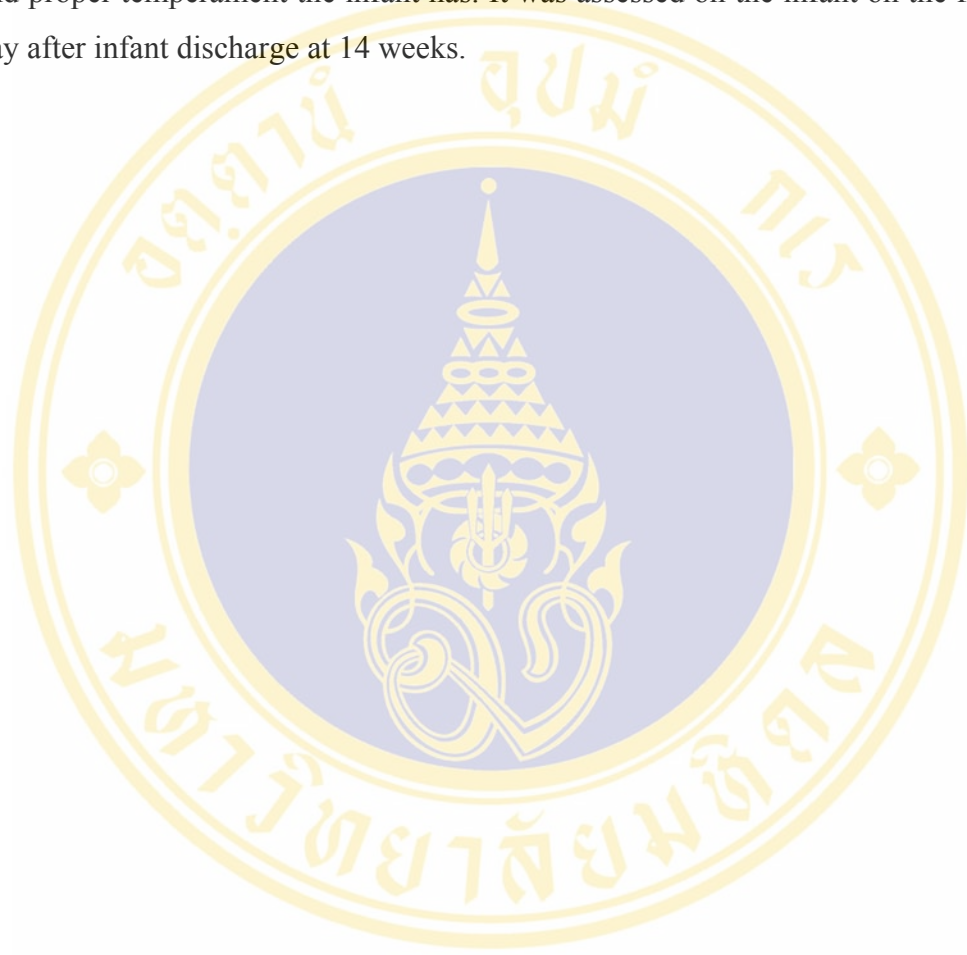
The results of screening test reported to the number of normal and suspect infants.

Normal means: No delays and a maximum of 1 caution.

Suspect means: Two or more cautions and/or one or more delays.

Temperament means: The behavioral style of the individual infant's expressions and reactions to the environment. It has four dimensions: 1) Malleability 2) Amenability 3) Responsitivity to stimuli 4) Persistence.

Temperament was measured by Pridham's Perceived Infant temperament-which name What My Baby is like (WBL) which developed by Pridham, Chang & Chiu. (1994: 381-392) and translated into Thai by Phumonsakul (2000). The total scores were totalized from 4 dimensions, the higher the score the higher adaptability and proper temperament the infant has. It was assessed on the infant on the follow up day after infant discharge at 14 weeks.



CHAPTER II

LITERATURE REVIEW

The purpose of this study is to study the effects of supportive-educative nursing system on mothers' dependent-care agency, growth, development and temperament of premature infants. The researcher has reviewed of related literature covered the following topics.

1. Premature infants.
2. Growth, development and temperament of premature infants and related factors.
3. Mothers' dependent-care agency.
4. Supportive-educative nursing system and related researches.

Premature infants

The definition of premature infants

Premature infants are infants born before completion of 37 weeks of gestation, regardless of birthweight (Finberg, 1998: 64; Whaley & Wong's, 1999: 392). The assessment of the gestational age is important because of the risk of health problems increasing with decreasing gestational age, which is assessed from the first day of the last menstrual period and by physical examination and neurological examination. Several techniques have been applied to verify the state of the infant in the gestational state such as Usher, Dubowitz and Ballard, etc. (Krisana Pengsa, & Sugunya Tuksapun, B.E. 2540: 21; Sherwen, Scoloveno & Weingarten, 1991: 883-886). The premature infant can be classified by a condition in the gestational age and infant's health problem. This can be categorized into three groups. (Bobak, Lowdermilk & Jensen, 1991: 767-770; Usher, 1981: 230-231).

1. Borderline premature infants have a gestational age of 36-37 weeks, with birth weights about 2,500 to 3,250 grams and found among 16% of live

newborns. The general appearance of a newborn is similar to full term infant and has a few unusual problems such as temperature instability, feeding difficulties, jaundice and respiratory distress syndrome.

2. Moderately premature infants have a gestational age of 31-36 weeks, with birth weights of about 1,500-2,500 grams and are found among 6% to 7% of all live birth. The health complications are respiratory distress syndrome, temperature instability, hypoglycemia, anemia, infection and feeding difficulties etc.

3. Extremely premature infants have a gestation age period calculated at 24-25 weeks with birth weights of about 500-1,400 grams and found among 0.8-1% of all live births. The mortality rate is high. They need specific caring due to the immaturity of physical functions and nervous system.

Characteristics of the premature infants

The characteristics of each premature infant varies according to the gestational age, with remarkable features for lesser gestational age (Cross, 1975: 1-10). The characteristics of a premature infant are as follows: (Cross, 1975: 1-10; Praputh Siripun, B.E. 2533: 66; Wilai Lerdthamatevi, B.E. 2528: 152).

1. The head appears large for the size of the body.
2. Small body size, improper length and less body weight due to gestational age.
3. The light skin is red and has visible veins, and little subcutaneous fat. Infant has little vernix caseosa.
4. Lanugo in the body especially forehead, shoulder, forearm and back. Hair is short and scanty.
5. The cartilage of the ear is immature and the earlobes are soft and easily folded.
6. The extremities remain in an extended position, do not flex.
7. The muscles are weak. The movement of extremities occur spontaneously with jerky movements.
8. The nipples are small and flat.

9. In the male, the scrotum is not pendulous, with few rouge and the testicles may be in the abdomen or inguinal canal in the female, the labia minora are not covered by the labia majora.

10. The toe-nails and finger-nails are shorter and softer than at term.

11. The infants have few or no creases on the soles of the feet.

12. The thorax is pliable; breathing with reaction at chest and at the line of diaphragm, and tends to be irregular in rhythm and depth. There are often found periodic breathing due to weak respiratory muscles, development of the lungs depends on gestation age.

13. Poor control of body temperature. Hypothermia is regularly found because of increased heat loss and the lack of subcutaneous fat, particularly brown fat.

14. The low level of gamma globulin during 4-6 weeks after delivery, it contributes to the poor response to infection.

15. The premature infant has limited ability to excrete solvents. Edema and dehydration tend to occur because of the imbalance of water intake and output.

16. Because of the limitation of iron storage, so anemia may occur afterwards.

17. The liver function is poorly developed. Jaundice tends to occur by reason of the inability of the liver to conjugate and excrete bilirubin.

18. The stomach is small and the undeveloped liver causes low bile production, which results in poor digestion and absorption of fat. They will have abdominal distention and vomiting.

19. The immaturity of reflexes issuing on coughing, swallowing and sucking may cause poor feeding, aspiration and regurgitation.

Due to the immature organs, premature infants have many health problems during the neonatal period. These relate to decrease gestational age and birth weight. The health problems are composed of birth asphyxia, respiratory distress syndrome, apnea of prematurity, hypoglycemia, hypothermia, jaundice of prematurity, anemia, intraventricular hemorrhage, necrotizing enterocolitis and sepsis. Therefore, the premature infant after birth needs intensive care immediately such as: (Bobak, 1991: 778-779; Rudolph, 1998: 66-68; Waley & Wong's, 1999: 398-410; Wilai Lerdthamavee, B.E. 2528: 153). 1) Maintaining respiration 2) Maintaining body

temperature 3) Maintaining adequate nutrition 4) Protection from infection 5) Developmental intervention and care 6) Skin care 7) Facilitating maternal-infant attachment

The premature infant can be discharged if they have no complications, stable body temperature, proper feeding, no sign of apnea for at least 5 days before discharge, weight gain about 15-22 grams/day and body weight about 1800 grams. (Urapon Boonprakorb, B.E. 2531: 14; Varicha Jenjindamai, B.E. 2542: 93-94).

Due to the premature infants need for intensive care immediately after delivery, they may need longer hospital stay as they have immature organ which will impact on the health of infants after discharging. There are many problems of premature infant comprising of:

First, Health problems

1. Respiratory problems. According to the premature infants having received more oxygen and a prolonged use of the ventilator, so, they will face bronchopulmonary dysplasia range from 15 to 47 percent, especially the premature infant whose birth weight is less than 1,500 grams (Blackman, 1991: 1503; Dusick, 1997: 165-166)

2. Vision problems. The immaturity of retinal vessels and received more concentrated oxygen over a prolonged time cause the premature infant increased risk for retinopathy of prematurity and other types of vision problems, including strabismus, myopia and cataract. There are 10 percent of infants under 750 grams who are blind. (Dusick, 1997: 173; Varicha Jenjindamai, B.E. 2542: 90; Vohr & Msall, 1997: 204).

3. Hearing problems. Premature infants who have birth weights less than 1,000 gram have found risk to have a hearing loss about 14 to 42 percent due to hypoxia, intracranial hemorrhage, systemic infection and side effects of ototoxic drug. The research finding of Leslie and colleagues (1995 cited by Dusick, 1997: 172) found the following factors related to an increased risk of sensorineural hearing loss : >90 days of oxygen use, maximum 90 percent of oxygen concentration (Dusick, 1997: 172)

4. Gastrointestinal problem. This problem was usually found necrotizing enterocolitis as a result of small bowel resection which caused short bowel syndrome. Its effect is poor digestion and malabsorption. Many preterm infants are diagnosed with gastroesophageal reflux that usually caused vomiting, poor feeding, aspiration and apnea. (Blackburn, 1995: 45; Dusick, 1997: 171)

5. Infection problems. This is because the premature infant has immaturity of their host defense mechanism due to lower level of IgG. During the first 6-12 months of life, 25-50% of premature infants were readmitted to hospital (Versus 8-10% for term infant). (Blackburn, 1995: 44)

Second, Behavioral problems.

This problem is the result of the immature of physiologic, severe complications, longer hospital stay, poor environment and lack of normal maternal-infant attachment process. After infant discharge at home, mothers find it difficult to take care of infants and the lack of confidence in their roles lead to diffident response to the need of infants and the infants can not communicate their need as well as term infants. The behavior problems are difficult to interpret in the first year including of: (Bernbaum, 1991: 266-268)

1. Behavior of sleeping making and waking: in the first 2-3 months of life infants frequently wake every 2 hours. The wake period is short, it seems they sleep all day.

2. Behavior of crying : is primarily behavior by which the infant communicates with the mother. The premature infants often increase their crying when they reach the age of 3-4 months. Crying patterns are loud, frequent, difficult to calm and they cannot indicate their need clearly. (Bernbaum, 1991: 267; Jutarat Meesukkho, B.E. 2540: 127)

3. Behavior of feeding: sucking and swallowing of the infant is complete when they reach gestation age 36-37 weeks (Wilson, 1994: 339-342). During the first 1-2 months of premature infants life, they have delayed sucking and swallowing due to the immaturity of the central nervous system and the weakness of muscles around the infants' mouth. They have poor squeezing of the esophagus and seem to be disconnected with sucking and swallowing. In addition, the infants have short waking

periods. This makes the mothers confused as to whether they are providing sufficient feeding to their infant or not.

4. Responsive behavior to mother's interaction : premature infants are less active, less responsive, vocalize less, smile less, avert their gaze more often and sleep almost all the time. Because of the immaturity of the central nervous system they receive improper stimulus after birth from hospital environment (Bernbaum, 1991: 267).

Third, Temperament problems.

Premature infants have been found to be temperamentally more difficult. They have shown specific characteristics of their temperament such as less adaptability, more negative in moods, more distractible, difficult to soothe and less socially responsive (Chapieski & Evankovich, 1997: 224; Mdooff-Cooper, 1986: 139-143). The essential factors were medical complications after birth, length of stay at hospital, birth weight, gestational age and the infants' environment. (Thomas & Chess, 1977 cited by Chapieski & Evankovich, 1997: 229)

Fourth, Growth problems.

Premature infants have been at risk of poor growth, due to many factors such as gestational age, birth weight, congenital abnormality, severity of illness, infection, nutrition, environment and heredity (Manser, 1984: 19-20; Whaley & Wong's, 1999: 424)

Fifth, Developmental problems.

Premature infants have immature of the central nervous system. This caused them to be at risk of delayed development which was found in the group of premature infants who have birth weights 1,000-1,500 grams. Their development was delayed about 9-20 percent (Bernbaum, 1991: 267). The risk factors were gestational age, birth weight, severity of illness such as hypoglycemia, hyperbilirubinemia, intraventricular hemorrhage and the infants' environment. (Bauchner, et. al., 1988: 1209)

The various problems caused the mothers of premature infants to feel anxiety, loss of self-confidence and self-esteem in infants' care. The role of mothers can lead to the infants' wrong care. The infant received overindulgence, overprotection and their mothers have a greater sense of vulnerability infant which consequently affects growth, development and temperament. (Miles & Davis, 1997: 258-261). The study of Mc. Kim (1993: 89-99) found that the mothers of premature infants perceive difficult and anxiety during the first week after discharge. They needed assistance from health professionals in this phase. Mothers' ability to care for their infant will increase 2 weeks after discharge then become maximum when infants reach 4 months of age. After that it seems to decrease because of the age and development of infants have been changed. (Mercer & Ferketich, 1994: 38-43). According to Bass's study (1991 cited by Vasquez, 1995: 623) found that during 3-5 weeks after discharge the mothers have adapted their role. Mothers of very low birth weight infants feel maximum anxiety during a week before discharge. (Brooten, et. al., 1988: 213-217) Thus, the important role of nurses was to give useful information and knowledge which the mother wanted to know and given in proper time. So, the mothers can face their depression and develop dependent care agency to care for their premature infants with confidence, respond to all the infants therapeutic self-care demand for a better quality of life for premature infants.

Growth, development and temperament of premature infants and related factors

1. Growth

Growth is defined as physical change, increase in the size of the body as a whole or the increase in its separate parts. (Nittaya Kotchabhakdi, B.E. 2536: 18; Tanit Issarasena, B.E. 2528: 1). The growth of fetus in the first trimester, increased cell number for the development of organs, is the period of major organogenesis. The second trimester from the fourth to the seventh month, is the period of greatest proportional increase in length of the fetus with continuing rapid brain development.

The end of this trimester the length of fetus about 35 centimeters and body weight about 1000 grams. The third trimester is characterized by continuing, rapid increases weight gain, length and brain growth. (Manser, 1984: 21; Tanit Isarasena, B.E. 2528: 4). The premature infants born at the end of second trimester until the third of trimester due to they will have low birth weight and be faced with many health problems resulting from immature organs. The growth of premature infants depends on the gestational age, birth weight, nutritional intake and duration and severity of neonatal illness (Manser, 1984: 22-25) Growth assessment of premature infants is evaluated from body weight, body length and head circumference. (Manser, 1984: 24)

Growth on premature infants is classified into 4 phases as following (Manser, 1984: 22-25; Marks, 1986: 59).

Phase 1 Growth delay: During the first three to seven days of life, body weight of premature infants decreases to 10-20 percent of birth weight due to lots of factors such as, gestational age, duration and severity of neonatal illness and nutritional intake

Phase 2 Transition: is the transition from the phase of growth delay to the phase of catch up growth, during 2-5 weeks after birth. There is initially a slow increase in head circumference paralleled by a slow increase in length.

Phase 3 Catch up growth: The third phase of growth is characterized by increase in weight, length and head circumference during 4-10 weeks after birth. The premature infants delivered following intrauterine growth retardation demonstrated catch up growth until 6-9 months following delivery, which depended on adequate nutrition and appropriate environmental stimulation.

Phase 4 Homeorrthesis: The fourth phase of growth is characterized by patterns that closely parallel the growth seen in standard growth charts. Growth rate of premature infants who experienced the longest period of initial growth delay and the slowest catch-up growth will be in the lowest percentiles or below standard growth charts.

The growth evaluation on premature infants to be recorded in standard infant growth chart must be plotted for the true gestational age rather than age after birth. For example, a infant born 3 months preterm should be assessed as a 9 months old, not a 1 year old, 12 months after birth. (Manser, 1984: 26; Rudolph, 1996: 261).

Age adjustment for weight and length, correction for gestational age is suggested until 24 months post term and for head circumference until 18 month post term. (Bauchner, et. al., 1988: 1208; Manser, 1984: 26; Rudolph, 1996: 261)

The normal increment of growth rate on premature infants are as follow (Varicha Jenjindamai, B.E. 2542: 88)

Body weight: The premature infant's weight increased about 15-22 grams per day during the first 2 months of life when infant aged 2-18 months, the average weight is at 0-1 SD of growth curve

Body length: The body length of a premature infant will be increased about 0.75 centimeters per week for the first 3 months of life.

Head circumference: The head circumference of a premature infant will increase about 0.8 centimeter per week at birth for the first 3 months of life. After the first 3 months, an average increase in each week is 0.5 centimeters.

The following table shows the summary of the average growth rate of premature infants on weight, body length head circumference (Varicha Jenjindamai, B.E. 2542: 88)

Table 1 The summary of the average growth rate of premature infants.

Age (months)	0-6	6-12	12-24	24-36
Body weight (grams/day)	23.0	14.4	6.8	5.5
Body length (centimeter/month)	2.8	1.6	1.0	0.7
Head circumference (centimeter/month)	1.4	0.7	0.2	0.1

The main factor for premature infants' growth are gestational age, birth weight, duration and severity of neonatal illness, nutritional intake, abnormal congenital anomalies, home environment and heredity. The frequency of growth assessments of premature infants without significant risk factors, who have appropriate growth and whose home environment appears appropriate, may only need to be evaluated every four to six weeks more frequent assessment is warranted in those infants with an initial growth delay of several weeks and with chronic disease (Bernbaum et. al, 1987: 45; Blackman, 1991: 1505; Manser, 1984: 34-35).

2. Development

Development is defined as the changes of form, function and maturity of the organs, including the ability to do something that is more difficult and complex, increase of new skills and the ability to adapt to the environment. The process continually changes from conception to maturity and through out life. Steps of development of each infant are similar but rate and duration of development are different. The level of development depends on the maturity of brain and nervous system. The direction of development is from the head to the feet, from gross to specific. Primary reflexes can be seen before true movement. (Nittaya Kotchabhakdi, B.E. 2540: 2-3)

Development is divided into 4 sides as follows: (Day, 1998: 381-383; Nittaya Kotchabhakdi, B.E. 2540: 2)

1. Physical development is shown through the physical capabilities to control the balance of various postures and movement by using gross motor skill and using fine motor skill to coordinate eye, hand and finger in the prehension of an object or action the various activities.

2. Cognitive development: means the capabilities to know, to think, to perceive, to solve problems, to process and to understand information about himself or herself and the environment (Bowden, et al., 1998: 209).

3. Emotional development: this is a change in capabilities to express emotion to other persons by behavior, facial expression, words, writing and drawing. The emotional development depends on individual temperament and capabilities for self adaptation (Nittaya Kotchabhakdi, B.E. 2540: 20). If mothers can learn cues and the emotion of infants, they can respond to the need of infants and the relationship between them will be improving.

4. Social development : this means the ability to make relationship with other persons. Infants' social development is initially influenced by their reflexive behavior and eventually depends primarily on the interaction between them and the caregivers. Attachment to the parent is increasingly evident during the first year. During the formation of attachment to the parent beginning at about 8 to 12 weeks of age, they cry, smile and vocalize more to the mother than to anyone else. At age 6 months infants show a distinct preference for the mother. They follow her more,

cry when she leaves, enjoy playing with her more and feel most secure in her arms. The strong attachment between infant and mother is foundational for various development. Erikson's psychosocial learning theory has the concept that infant who has an interaction with external environments will develop his or her personality. The infant's age period of 0-1 years is concerned with a sense of trust and mistrust. The trust that develops is a trust of self, of others, and of the world. Infants "trust" that their feeding, comfort, stimulation and caring need will be met. The crucial element for the achievement of this task is the quality of both the parent-infant relationship and the care that the infant receives. The provision of food, warmth, and shelter by itself is inadequate for the development of a strong sense of self. If the infant received unsuitable care, mistrust is the eventual outcome. Therefore consistency of care is essential.

According to Ainsworth's study (1978 cited by Berk, 1994: 417-418; Nittaya Kotchabhakdi, B.E. 2540: 21-22) found that in a new exotic situation a child aged 12-18 months who has varied level of attachment with mother will also have different behavior clearly. If the development of attachment has gone along well, child should use the mother as a secure base from which to explore an unfamiliar playroom. After a short separation, the child may or may not cry and they show a strong preference for her over a stranger. When the mother returns, they actively seek contact and are easily comforted by their mother's presence. Poor attachment characterizing infants who remain close to the mothers before departure and display angry, resistive behavior when they return. Premature infants show a difference in behavior from term infants such as sleeping, waking, feeding and rarely respond to their mothers. Worse than that mothers who lack knowledge of infants' need leads to their infants don't meet their need, lack of touch, does not stimulate development, poor attachment with mothers. The study of Bauchner found that very low birth weight premature infants risk of developmental problem about 9-20 percent (Bauchner, et al., 1988: 1029; Blackburn, 1995: 43-49). From the study of Ross and colleagues (1980 cited by Bauchner, et al., 1988, 1205) about 94 premature infants were followed to assess their development until the age of 4 years. They found that at one year about 9 percent of children have abnormal developmental score (Bayley scales of infant < 70). At 3 year of age, of those infants classified as normal at 1 year,

4 percent had an abnormal score. Risk factors for poor developmental outcome include not only birthweight, but also gestational age, the length of mechanical ventilation used because of the immaturity of organs, resulted the premature infant having many complications to effect for development e.g. hypoglycemia, hyperbilirubinemia, intraventricular hemorrhage (Bauchner, et al., 1988: 1209; Ballard & Bernbaum, 1996: 260). Problems found in premature infants include fine motor adaptation, delay in cognitive development, hearing problems, vision problems, speech and language problems. These problems are important for the quality of life of the premature infants, if the evaluation is conducted at the right time together with mother's close care and suitable age to early intervention will benefit infant's capabilities for normal development (as shown in the Table 2).

Table 2 Normal development during infancy.

Age (months)	Gross Motor	Fine Motor	Vocalization	Socialization/ cognition
1	Turns head to side when prone, Lifts head momentarily from bed. head Wobbles.	Hand predominantly closed. Grasp reflex strong. hand clenches on contact with rattle. Able to fixate on moving object in range of 45 degrees when held at a distance of 20-25 cm.	Makes small, throaty sounds. (Cries to express displeasure)	Watches parents face intently as she or he talks to infant.
2	When prone, can lift head almost 45 degree off label when held in sitting position, head is held up but bobs forward.	Hand frequently open Grasp reflex fading. When supine follows dangling toy from side to point beyond midline	Coos., Vocalized to familiar voice	Demonstrates social smile in response to various stimuli

Table 2 Normal development during infancy (continued).

Age (months)	Gross Motor	Fine Motor	Vocalization	Socialization/ cognition
4	Able to raise head and chest off surface to angle of 90 degrees. Balances head well in sitting position.	Follows object to periphery (180 degrees). Inspects and plays with hands. Can carry object to mouth. Beginning eye-hand coordination	Makes consonant sounds. Laughs aloud. Vocalization changes according to mood.	Anticipates feeding when sees bottles or mother. Enjoys social interaction with people.
6	When prone can lift chest and upper abdomen off table, bearing weight on hands. Can turn over from abdomen to back. Pulled to a sitting position, lifts head. Sitting for longer periods when back is well supported. Held in standing position bears almost all of weight.	Grasp objects voluntarily. Transfers objects from one hand to the other. Grasps feet and pull to mouth. Able to sustain visual inspection of an object.	Can localized sounds made above the ear. Begins to imitate sounds. Babbling resembles one-Syllable utterances ma, mu, da, di	Recognizes parents; begins to fear strangers. Briefly searches for a dropped object. Sucks food from spoon.
9	Sits steadily unsupported. Creeps on hand and knees. Pull self to standing position and stand holding onto furniture.	Uses thumb and index finger in crude pincer grasp. Rakes at a small object. Reaches persistently for toys out of reach	Responds to simple verbal commands. Combines syllables, Such as-dada but does not ascribe meaning to them	Plays peekaboo Increasing fear of strangers show signs of fretfulness when parent disappears. Mother is increasingly

Table 2 Normal development during infancy (continued).

Age (months)	Gross Motor	Fine Motor	Vocalization	Socialization/ cognition
12	Walk with one hand held cruises well. May attempt to stand alone; May attempt first step alone. Can sit down from standing position without help	Releases cube in cup. Has neat pincer grasp. Drops object deliberately for it to be picked up can follow rapidly moving object.	Say three to five words besides “dada” “mama” Comprehends meaning of several words. Recognizes objects by name. Understands simple verbal commands. (eg., “Show me your eyes”)	important for own sake Show emotion such as “jealous, affection, anger, fear. Enjoys familiar surroundings and explores away from parent. Searches for an object even if it has not been hidden, but searches only where object was last seen

(Sources: Whaley & Wong's, 1995: 532-536)

Mothers can evaluate the infants' development by observing infants' ability compared with their ages. Suitable early interventions are essential. When using assessment tools for premature infants, the age of the infants should be corrected for the extent of prematurity, until the infant reaches 1 year of age (Bauchner, 1988: 1212). Very low birth weight infants are vulnerable to poor developmental outcome and they should be assessed by formal screening tests. The standard test is the Denver II that should be assessed continually, at 2 months, 4 months, 9 months, 1 year and 2 years by pediatricians, nurses and public health officials (Nittaya Kotchabhakdi, B.E. 2542: 64)

The Denver II is very useful as a screening instrument, to identify infants with risk of developmental problems. If the infant does not pass, further more detailed developmental testing is indicated. The test compares the child's development with that of child at the same age, whose the standardized population about 2000 children. So this test is not an indicator to predict future capabilities in development of the children.

Denver II has been revised from the Denver Developmental Screening Test (DDST) by Frankenberg in 1990. It assesses the development of children from birth to age 6 years with 125 items in four categories as following 1) Personal-Social 2) Fine Motor-Adaptive 3) Language 4) Gross motor

The criteria to report the result are assigned to total evaluation for all items. Normal and suspect score is given to reported.

However, several factors affect on the development of a premature infant such as gestational age, birthweight, severity of complications, use and length of mechanical ventilation, asphyxia, infection, and particularly intraventricular hemorrhage with grade III or IV having developmental delay. Hydrocephalus occurs about 35 percent of intraventricular hemorrhage grade III and 90 percent in grade IV. (Bauchner: 1988, 1218; Blackman, 1991: 1503; Wildrick, 1997: 283). Besides; other factors are nutrition, infant's environment and particularly home environment, caretaking environment, socioeconomic status, family size, maternal mental health, maternal anxiety, maternal behaviors and the level of education of the mother (Bauchner, 1988: 1211; Day, 1998: 385)

3. Infant temperament

Infant temperament is the potential for action the underline different forms of behavioral expression. Especially temperament represents the characteristics that distinguish between responses among individuals as a function of attitude, tone, intensity and persistence of expression. (Thomas & Chess, 1977: 9 cited by Piriya Taratontpisuthikul, B.E. 2532: 11). Infant temperament effects emotional expression and reacts to each infant's environmental state. (Tasanawat Somboontham, B.E. 2540: 53). The New York Longitudinal Study, initiated in 1956 by Alexander Thomas and Stella Chess, is the longest-lasting study of temperament to date. A total of 141

children were followed from the first few months of life into adulthood. Results showed that temperament is a major factor in increasing the chances that a child will experience psychological problems or, alternatively, be protected from the effects of a highly stressful homelife. (Berk, 1994: 407). However, environmental circumstances seemed to modify children's emotional styles considerably. Thomas and Chess (1977 cited by Carey, 1992: 86) identified nine dimensions of temperament as following (Berk, 1994: 407; Chapieske & Evankovich, 1997: 222; Teti, & Gibbs, 1990: 217).

1. Activity level : The degree of motor activity observed in the infant's behavior
2. Rhythmicity: The predictability and regularity of the infant's patterns of feeding, eliminating and sleeping
3. Approach/withdrawal: The nature of the infant's response to a new stimulus such as food, toys and people
4. Adaptability : The speed and ease with which the infants adapts to unfamiliar people and novel situations
5. Intensity: The magnitude of the infant reaction
6. Threshold of responsiveness : The level of stimulation required for the infant to respond to sensory information, objects in the environment, and social overtures.
7. Quality of mood : The behavioral and emotional display of the infant ranging from pleasant, joyful and friendly to unpleasant, crying and unfriendly
8. Distractibility : The effectiveness of extraneous stimulation in interfering with the infant's ongoing behavior
9. Attention span and persistence : The length of time and infant can pursue and activity and the infant's continuation of an activity in the face of obstacles.

Infants can be classified into three types of children by Thomas and Chess (Berk, 1994: 407)

1. The easy child (40 percent of the sample): This child quickly establishes regular routines in infancy, is generally cheerful, and adapts easily to new experiences.

2. The difficult child (10 percent of the sample): This child has irregular daily routines, is slow to accept new experiences, and tends to react negatively and intensely.

3. The slow to warm up child (15 percent of the sample): This child is inactive, low in approach and adaptability, mild and negative in mood.

Of the three temperamental types, difficult pattern present behavior problem at school age (Berk, 1994: 407; Piriya Taratonpisuthikul, B.E. 2532: 15). Premature infants historically have been reported to be temperamentally more difficult than full term infants (Field et. al., 1978: 75-85 cited by Chapieski & Evankovich, 1997: 223)

There are questionnaires conducted to measure a child's temperament divided by age, used for infant such as Chess's instrument (1968) and Revised Infant temperament Questionnaire (Carey, 1978) is a simplification of the research interview of Thomas and Chess. It is used for measuring infants age 4-8 months, and for infants age 0-4 months, Pridham's Perceived Infant temperament (1994) that developed from the nine New York Longitudinal study by Pridham, Chang & Chiu. (1994: 381-392). This instrument is a simply tool used for mothers of very young infants, the 19-item Pridham's instrument has four dimensions. First, malleability: the infant's approach to or acceptance of new things, adaptability in general and in feeding and sleeping. Second, amenability: soothability, positivity of mood, diversion from crying and regularity of feeding and sleeping. Third, responsivity to stimuli: sensitivity to sounds and environment events, such as activity level during bathing and diapering, and intensity of expression of self and feeling. Last, Persistence: representing a young infant's engagement with the world. Because of it offers simplicity and coverage of all infant temperament dimensions (Pridham, Chang & Chiu, 1994: 384), Pridham's perceived infant temperament is used in this research.

However, the important problem for mothers of premature infants are that their infants seem to be difficult infants because mothers can not understand infants' cue, can not respond to infants' need and poor attachment. The nurses' responsibility are to provide nursing intervention to enhance knowledge and skill of the mothers can learn, accept and understand the behavior and temperament of their infant, and adjust

the infants' proper care. From this result, the behavioral problems of premature infants will be reduced (Zahr, 1991: 289).

According to Cooper's study (1986: 141), compared the temperament of very low birth weight infants to that of full term infants at 6 and 12 months of age. She found that very low birth weight infants are more difficult infants than full term infants and the social environment of very low birth weight infant plays an important role in the manifestation of infant temperament as early as 6 months of age. From the study of Zahr (1991: 262), to investigate the relationship between maternal confidence in mothers of premature infants, maternal behaviors and skills and infant temperament, the results indicated that infant temperament plays an important role in predicting the relationship between mother and infant, in infants between 4 and 8 months, and temperamentally difficult infants caused their mothers to be more depressed and less confident. However, the factors have an effect on premature infant temperament depending on the severity of complications after birth, length of medical care, gestational age, birth weight, infant environment and attachment between infant and mother. Mothers can play a major role in reducing infant's behavioral problems (Thomas & Chess, 1992: 88; Chapieski & Evankovich; 1997: 224).

Factors related to growth, development and temperament of premature infants.

According to revision of the research and related documents, factors of growth, development and temperament of premature infants are as following: (Bauchner, et. al., 1988: 1216; Blackman, 1991: 1505; Manser, 1984: 35; Nittaya Kotchabhakdi, B.E. 2536: 3-4, 29; Thomas & Chess, 1992: 84-94; Waley & Wong's, 1999: 389;)

1. Genetic inheritance

Genetic inheritance limits individual potentiality such as genetic disease, physical characteristic and intelligence level of parents. This ensures that the characteristics of each infant are different.

2. Past history

Past history includes prenatal environment: this means maternal health during pregnancy that effects the early development of infants such as nutrition and

additional hormones given, medicine, tobacco, infection, and mother's anxiety. Intrapartal environments: are comprised of maternal and neonatal environments. In the maternal environment, the feeling of fear, anxiety and loneliness will effect the birth process. On neonatal environment, complicated labour, birth asphyxia, infection and medicine may causes problems in infants. Postnatal: means infant health such as gestational age at birth, weight, head circumference, length at birth, length of growth delay, length of hospitalization, congenital anomalies, nutrition and received medicine.

3. Medical complication and its severity in premature infants.

Premature birth results in the premature infant having immature organs and risks the delay of growth and development such as bronchopulmonary dysplasia, short bowel syndrome anemia, patent ductus arterious, other congenital heart disease, renal disease, subglottic stenosis, intraventricular hemorrhage, intracranial infection, hypoxia and hypoglycemia.

4. Infant's environment and proper care: means nursery or NICU environment including the family where infants live after being discharged from hospital. The environment management and developmental care are important to promote the development, temperament and growth of infants. The family system is considered to be the environment for infant development. The family system includes family status, family size, maternal attitude, level of education, maternal experience.

The conclusion, there are two important factors related to growth, development and temperament of premature infants. These factors are biological factors, psychological and social factors. First, biological factors include genetic inheritance, past history and medical complication. Second, psychological and social factors include perception, cognition, learning ability of each individual and infants' environment. Particularly, quality of environment is very important, the caretaking environment has a profound impact on the premature infant's long term development. An infant's resilience to biologic problems can be ameliorated by a supportive and stimulating environment. The proper nursing intervention to develop mothers' dependent- care agency of premature infants is the important role of nurse. If the mother can develop dependent-care agency to care for her premature infant and

respond all the infant therapeutic self-care demand, the infant will have good quality of life.

Mothers' dependent-care agency

According to Orem's theory, the concept of the dependent-care agency is the same as the self-care agency which is essential to nursing intervention. Nurses have to develop dependent-care agency for the dependent-care agent (Jariya Vittayasuporn, B.E. 2539: 62). The mothers are the dependent care agent for premature infants. Dependent care agency of the mother comprise 3 levels of capabilities as following 1) Capabilities for dependent care operation to perform estimative, transitional, and productive operation in knowing and meeting the therapeutic self care demand of premature infants 2) Power component: Enabling capabilities for dependent care. Both of these depend on 3) Foundational capabilities. Dependent care agency is the complex acquired ability to incorporate knowing and meeting health-deviation self-care requisites of premature infants and the needed adjustment in universal and developmental self care requisites into an ongoing system of premature infant care and mother activities (Orem, 1991: 242).

The estimated mother's capabilities for dependent-care agency of her premature infant have to be evaluated. The mother's capabilities to respond to the therapeutic self care demand of the premature infant is to be functional. Structure and development shall progress to the maximum point for good quality of life. From the literature review can be summarized therapeutic self-care demand under the conceptual framework of Orem's theory as follow: (Cagen & Meier, 1983: 275-280; Crowley, 1993: 1080; Cusson & Lee, 1993: 63; Jutarat Mesukko, B.E. 2540: 7-18; Orem, 1991: 191-202; Somsiri Atthaseri, B.E. 2540: 17-33; Somtrong Koafai, B.E. 2541: 18-22; Waley & Wong's, 1999: 388; Wilai Lerdthamatevi, B.E. 2528: 152-166)

1. Providing infants with clean and well ventilated air in sufficient quantity by to prepared good environment; the sleeping room must be good ventilation and clean, proper temperature, not taking infant into any crowed place.

2. Providing proper food and water in a suitable quantity. The premature infants need appropriate nutrition, normally need high nutrients so that they can

increase in growth rate. They need energy for their basic need and their growth amount 120-140 calorie/kg/day. The nutrient of breast milk is significant and suitable for them. It is rich with full food substances giving good immunity. It is easily digested and will be absorbed and will increase the maternal-infants bonding which will enhance neurocognitive development. However, first of all mother herself should realize that breast-feeding is really good for premature infant. Mothers should be advised to gain knowledge of breast-feeding technique and the way to maintain milk volume. The essential factor that affects milk volume include early, frequent stimulation and emptying of the breasts, adequate rest and stress reduction and adequate nutrition (Meier & Brown, 1996: 356). The premature infant would require breast feeding at every 3 hours for 8-10 meals a day in the first 2 months of life. At least 30-40 minutes per meal must be given because of the infants' immature feeding behaviors. The mothers should try to activate premature infants to have better suction for adequate volume of breast milk. And when premature infants are aged 4 months, they will be given supplement.

3. Providing infants to excrete normally. Premature infants sucking in breast-milk makes them excrete feces 3-4 times daily with soft yellowish feces and they should urinate 5-6 times per day. Urine is clear, yellow without residue. The mothers should carefully observe any abnormal excretion.

4. Providing care to protect from infections. The infant needs to be bathed 1-2 times daily. After the infant's excretion, cleaning with water or absorbent cotton soaked with water should be done immediately. The mothers have to clean the environment, clothes, bed sheet, room and toys. Mothers need to be aware of contamination infections and not to take infants to crowded areas. Giving the vaccination to the premature infant at the appropriate ages is the same as vaccinating the normal infants to build up an immunology state to prevent infection.

5. Providing enough rest and sleep for infants. The premature infant has an inconsistent sleep and waking pattern, which can be classified into 6 periods of deep sleep, drowsy, light sleep, quiet alert, active alert and crying. In the first 3-4 months after delivery, premature infant may sleep lightly, awakening every 2 hours during the day with short waking periods. They seem to sleep all the time and their average sleep should be about 17.57 hours per day.

6. Providing care to promote proper development. The mother should be learning and understanding infant's cue and needs, so that she could respond suitably to the infant's need. The premature infant needs hugging, massage and soft touch, eye-contact, holding in the arms, playing, smiling, soft spoken voices and listening to soft music. The mothers shall look after their infant with love and respond to the infants' needs at the proper time. The best time to promote development and build up a relationship should be done at quiet alert and active alert stages (Censullo, 1986: 150).

7. Keeping observations and follow-up of the premature infant's growth by body weight and body length measuring, is assessed by recording in a standard infant growth chart and must be plotted for the true gestational age. The body weight should increase in the premature infant about 15-22 grams per day during the first 2 months of life and body length increase about 0.75 centimeters per week. Premature infants need to have good care from their parents by providing them with enough food and good environment at home.

8. Providing care to prevent health problems should be followed up by vaccinations. The mother should observe and assess abnormal symptoms that may happen to the premature infant such as fever, diarrhea, vomiting, decreased activity, abnormal respiration, contact dermatitis and thrush. The mother should have knowledge to manage, when these health problem occur, and she must take her infant to a doctor immediately.

9. Providing care to prevent accident and danger to the premature infant's safety. The mother should prevent accidents such as falling, aspirating, danger from knives, burning and drowning and she should be aware of accidents, careful to look after the infant all times and to create a suitable environment.

10. Providing care by responding to therapeutic self care demand by premature infants. The mother should be taught to develop infant care method in normal and in sick conditions to seek help from resources, health officials, and learn appropriate care of the infant in the mother's daily activities. The goals of mother will be to develop infant's potential to the maximum point, proper growth, development and temperament.

Nurses are the person who take the role of developing the dependent-care agency of the mothers to enable them to look after their premature infants, by

assessed if there are more therapeutic dependent-care demand than dependent-care agency of the mother. According to Jensen and colleague (1981: 700-701 cited by Tudsuang Pounyathalung, B.E. 2541: 22) it is found that the mothers determine the capabilities in the premature infants care from their capability in responding to the needs of the infants as assessed by infants' responses. If infants cry or respond unsatisfactorily, the mothers will understand that they may not have performed their functions properly. Therefore, building confidence for the mother so that believe they can look after the premature infant by giving her knowledge, skills and valuable experience, will help develop the mother's dependent-care agency for her infant.

The Instruments for assessing dependent-care under Orem's theory have been created by many researchers as follow: The Denyes self care Agency Instruments of Denyes, (1981 cited by Somchit Hanucharurnkul, B.E. 2540: 308) the instrument measured for Power Component on the self-care agency of adolescence. On measuring the concept of dependent care agency, Fildey (1986 cited by Jariya Wittayasuporn, B.E. 2539: 64) has applied the Denyes/Fildey Dependent-Care Agency Instrument to an experiment developed from the Denyes Self Care Agency Instrument, by changing the objectives in self-care to the dependent-care agency and used it measure the dependent-care agency of parents who have brought their infant for follow up study in development clinics. Nevertheless; the use of this instrument is limited, it might not predict the capabilities operational stage and it does not cover all the 10 power components as instructed by Orem.

The Appraisal of Self-Care Agency Scale by Ever and Others (1986, cited by Somchit Hanucharurnkul, B.E. 2540: 306) is used in measuring the performance of the self-care agency for responding to universal self care requisites in normal conditions and in sickness has to be adapted to suit the sick person and the disease and treatment. This instrument is created on the foundation of the 10 power components and activities performance in self-care. It can measure self-care agency by answering each question showing how it is used in self-care agency, Somchit Hanucharurnkul, (B.E. 2532) has translated into Thai language and adapted it for use with cancer patients. The previous studies have adapted the questions and used it for sample groups such as patients with SLE, aging people, mothers and children. The study on dependent-care agency has been adapted from Evers' instrument used for research by

Skawrat Puangchan, (B.E. 2538: 98-100) which studied mothers of chronically ill children, Manee Kuprasit, (B.E. 2539: 92) studied of dependent-care agency in parents of the 5 years old children. Tudsuang Pounyathalung (B.E. 2541: 77-78) studied self care and dependent care agency in primipara and Suwannobol (2000: 72-73) studied dependent care agency in mothers of premature infants.

In this study on dependent-care agency of the mothers of premature infants, the researcher was interested to study dependent-care agency of the mothers by using the measuring instrument in self-care by Evers and others (1986: 9) that Manee Kuprasit (B.E. 2539: 92) adapted to measure the parents of the 5 years old children which the researcher adapted by revising to appropriate sample groups. The researcher believed that this measuring level could measure the dependent care agency of the mothers of premature infants close to the performance of premature infant care.

The supportive-educative nursing system and related researches

In this study, the use of the supportive-educative nursing system, attain the goal to enhance mothers' capabilities to care their premature infants after discharge. This based on Orem's theory. This system is the activity performed using the nursing agency to adjust and remedy the balance between the dependent care agency and therapeutic-self-care demand of the premature infants. The supportive-educative nursing system will occur when the nurse communicates with the mother to identify problems and dependent-care demands and takes such action in response to the therapeutic dependent care demand of the premature infant. It includes developing the dependent-care agency of the mother to respond to the premature infant care. This nursing system is changeable according to mother's capabilities and the therapeutic dependent care demand of the premature infant, and shall comprise teaching knowledge, guiding and supporting, and environmental arrangements suitable for developing dependent care agency. The nurse will be the support person by providing skill and knowledge and will enable the recipient to be knowledgeable and skillful in selected self-care behavior.

To increase skills in developing dependent care agency of the mothers of premature infants to care their infants at home by using the supportive-educative nursing system which based on Orem's theory is the important process. This process can reduce their anxiety and increase their capability to care their infants with confidence. According to the study on the need of mothers of premature infants before discharge (Hamellin, et. al., 1997: 35), found that the mothers lacked preparation and education to care for their infants after discharge. In addition to concerns about general infant care, these mothers worried about apnea, respiratory status, growth and development progress. From a result of this study, neonatal nurses at the study hospital have developed programs and strategies to help the parents of high risk infants cope, both during and after hospitalization. The preparation of mothers before discharge can be divided into 4 stages (Conlangelo, Vento & Taeusch, 1987 cited by Ladden, 1990: 621) as following

1. Assessment by the NICU team must be accurate and highly individualized. This team begins their assessment on admission and revises it throughout the NICU course.
2. Consultation with community agencies, specialists, and continuing care nurses to identify supportive resources for assisting the family after discharge at home.
3. Implementation by beginning the premature infants' course as the discharge need and plan.
4. Evaluation after the premature infants at home are the final steps in the process.

Thus, nurses are in an optimal position as advocates for these premature infants and their families. The nursing intervention plan is to benefit each family and for responding to therapeutic self-care demand of the premature infants. The researcher was interested in the study and aim to improve the efficiency of nursing intervention to meet mother and premature infant's demand.

Several researchers have studied the supportive and educative nursing system which benefit nursing intervention in many ways as following.

Hall (1980: 317-322 cited by Tudsuang Pounyathalung, B.E. 2540: 25) studied the effectiveness of the supportive-educative nursing system to capability of

primigravida among 30 cases on the behavioral perception of infant. It found that teaching with an intervention-plan had an effect on the behavioral perception of the infant. Steven and Pavlide (1989; 521-522) conducted a pilot study into the effect of instruction on self-care and follow-up of the supportive-educative nursing system on adolescent pregnant woman, 21 cases of experimental group and 16 cases of control group. The study found that the experimental groups had better nutrition than the control group and had lower anemia, sick rates during gestation and after delivery than the control group. Nongnuch Vithayachockitikhun (B.E. 2536: 66) studied the effect of the supportive educative nursing system on practice and satisfaction in breast feeding and maternal infant bonding (73 cases). The study has shown practice of breast feeding in the experimental group was higher than the control groups on the third day and six week period after delivery. Somtrong Koafai (B.E. 2540: 45) has studied the effects of maternal preparation on premature infants care self efficacy and care behavior in 20 cases. The study found that the experimental group had better perception of premature infants care, self efficacy and care behavior than the control group with statistically significant. Tudsuang Pounyathalung (B.E. 2541: 45) studied the effect of the supportive-educative nursing system on self-care and dependent-care agency and satisfaction with nursing care in primigravida among 80 cases. The study found that the experimental group has more self-care and dependent care agency and satisfaction with nursing care than the control groups with statistical significance, which indicated the benefits of the Orem's theory nursing system in developing self-care and dependent-care agency. Suwannobol (2000: 101-102) studied the effects of supportive educative nursing system on anxiety, dependent-care agency of the mother and growth of the premature infants among 60 cases. The study found that the mean anxiety scores in the experimental group was significantly lower than the anxiety scores in the control groups and the mean dependent-care agency scores and growth of the premature infants in the experimental group were significantly higher than in the control group.

From the literature review as mentioned, it is found that the nurse's responsibilities were to provide nursing intervention for reducing stress in mothers, at the same time to enhance knowledge skill and developing dependent care agency of the mothers to care their premature infants with confidence and can enhance the

maximum potential of their premature infants. In this study, the researcher was interested in studying and adapting Orem's theory of the supportive-educative nursing system to be the guideline for providing nursing intervention plan to develop mothers' dependent care agency and promote growth, development and temperament of premature infants.



CHAPTER III

METHODOLOGY

This study was a quasi-experimental research to determine the effects of supportive-educative nursing system on mothers' dependent-care agency, growth development and temperament of premature infants.

Population and sample

The population in this study were the mothers and their premature infants who were admitted at the Premature Infants Units and follow up at Outpatient department of Pediatrics at Queen Sirikit National Institute of Child Health and Bangkok Metropolitan administration Medical College and Vachira Hospital during September 2000 – April 2001. The researcher selected the sample by purposive sampling technique. The inclusion criteria for subjects were as follows.

Mother:

1. Having the first premature infant.
2. Caring for the premature infant by herself after discharge at home.
3. Able to speak, read, write and understand Thai language.

Infant:

1. Gestational age between 32-35 weeks according to the doctor using-Ballard score assessment.
2. Without congenital deformities and intraventricular hemorrhage.
3. No complication before discharge.

Exclusion criteria:

1. During the experiment, premature infants developing an illness and having to be admitted.
2. Premature infants, who loss followed up.

The sample size was collected on the principle of Polit and Hungler (1983: 426-427) which suggested that an experimental research should involve at least 20-30 cases. For the sample of comparison, the number of sampling in each group should be not less than 10 cases. Therefore, the researcher considered by using the 60 cases as the sample group, divided into 2 groups, of which 30 were the control group and 30 were the experimental group.

During the 7 months of study, there were 68 cases of premature infants in the inclusion criteria and collected (control group = 36, experimental group = 32). Fourteen cases (control group = 8, experimental group = 6) were deleted from the study because 2 premature infants in control group were admitted to the hospital after discharge, 1 case of pneumonia and 1 case of R/O sepsis, 12 case (control group = 6, experimental group = 6) could not be followed up. Thus, 54 cases were divided into 2 groups of which 28 case were the control group (premature infant unit at Queen Sirikit National Institute of Child Health = 14, premature infant unit at Bangkok Metropolitan administration Medical college and Vachira Hospital = 14) and 26 cases were the experimental group (premature infant unit at Queen Sirikit National Institute of Child Health = 14, premature infant unit at Bangkok Metropolitan administration Medical college and Vachira Hospital = 12). The researcher studied the control group first and the experimental group later. This design was selected to prevent contamination of the intervention due to the two groups meeting and exchanging knowledge and thoughts, and to prevent the feeling of unfairness in intervention.

Setting

Two places of study with similarity of internal environment and nursing activities were composed of

1. Queen Sirikit National Institute of Child Health

Premature infant unit at Queen Sirikit National Institute of Child Health that provided nursing care to 30 infants weighing less than 2,000 grams at birth in the incubators. Open visiting hours were encouraged to facilitate parental visiting at 12 a.m. to 6 p.m. When infants were in the incubator, mothers were allowed to touch and change diapers. After they were in the cribs mother could hold and feed their infants. There are breast feeding and bottle feeding provided in the ward. Nurses provide

education on feeding and changing diapers to mothers. Healthy premature infants were discharged from the hospital at minimum weights of 2,000 grams and/or gained weight adequately. On the discharge day, a nurse gave advice to the mothers on oral medication, observation of abnormal symptoms, and follow up appointments. They are given an instruction sheet for infant care.

The Outpatient department of Pediatrics gives services to premature infants on Tuesday and Wednesday at 1 p.m. – 3:30 p.m., and there are about 30-40 premature infants to follow up per day. The session consists of assessed growth by a nurse, physical exam, assessed development and ordered to immunization or medicine by a doctor and given immunization by a nurse.

2. Bangkok Metropolitan administration Medical college and Vachira hospital

The Premature infant unit at Bangkok Metropolitan administration Medical college and Vachira hospital that provided nursing care to 20-30 high-risk infants is similar to the operational regulation at Premature infant unit at Queen Sirikit National Institute of Child Health. Open visiting hours were allowed to parental visiting from 10 a.m. to 8 p.m. The mother could touch, hold, breast feed or bottle feed and change diaper, when the infant was in the incubator or crib. Nurses provided education to the mothers on breast feeding, burping, holding infant and changing diaper. There was the room for the mothers to breast feeding. On the discharge day, the mother was given an instruction sheet for infant care, advice about oral medication, how to observe of abnormal symptoms and follow up appointments by the nurse.

The Outpatient department of Pediatrics gives services to premature infant on Friday from 8 a.m. – 12 a.m., and there are about 40 premature infants to be follow up per day. The premature infants have received nursing intervention and doctor's treatment similar to premature infant at Outpatient department of Pediatrics at Queen Sirikit National Institute of Child Health.

Instrumentation

The instruments of this study were composed of the following:

1. The research instruments included

1.1 Supportive educative nursing system plan:

This plan based on Supportive-Educative Nursing System of Orem's theory, to be applied to mothers of premature infants. It consisted of building relationships at the same time evaluating demands and problems, giving of knowledge, guiding, supporting and managing the environment to develop dependent-care agency of the mothers. The researcher has created this plan through texts, literature review and interviewing the mothers of premature infants and citations recording to Orem's theory. It will be provided to the experimental group. The supportive-educative nursing system plan involves the following steps:

Step to intervention

1. First step : preparation

1.1 The researcher surveys the premature infants, who the doctor planned to discharge.

1.2 Building a relationship individually with the mother of a premature infant before discharge.

1.3 Explains the research objective, benefits, duration and steps of the study and willingness to participate in the study.

2. Second step: operation

2.1 Three days before premature infants discharge at Premature infant unit.

1) First day

- The researcher encouraged to the mother individually to express her anxiety and problems related to premature infant care at home.

- Individually assessment of the mother's capability to care her premature infant and her need to learn by observation and questioning infant care. The researcher has to set objectives with the mothers.

- The researcher recorded personal data questionnaires

- The researcher gave to the mother the handbook of caregiving of premature infants to the mother.

- The researcher explained her knowledge about premature infants' care and demonstrated daily infant care and breast feeding.

- The mother practiced her skill to care for her premature infant, and breast feeding. This process was assisted and reinforced of the researcher

- After the skill training the researcher asked for questions and encouraged the mother to express her feelings at the same time made an appointment for the second day.

2) Second day

- The researcher greeted the mother and encouraged her to discuss her feelings and her problems.

- The researcher explained about the behavior of premature infants, proper development, how to assess and stimulate development, and growth of premature infants.

- The mother practiced caring for her premature infant, breastfeeding and observed the behavior of her premature infant. This process was under the supervision and encouragement of the researcher.

- After the skill training the researcher asked for questions and encouraged the mother to express her feelings and her doubts and made an appointment for the third day.

3) Third day

- The researcher greeted the mother and encouraged her to discuss her feelings and her problems.

- The researcher explained the mothers about health problems in premature infants, preventing infection, and the necessity to follow up by the doctor, receiving vaccinations, the method of giving medicine, arrangement for the proper environment at home and protecting premature infant from accidents.

- The mother practiced the skills that she had learned and the researcher reviewed the previously learned knowledge. This process was under the supervision and encouragement of the researcher. The review was done until the mother felt confident.

- After the training the researcher asked for questions and encouraged the mother to express her feelings and her doubts and at the same time gave information about assistance they could have after discharge, and provided mothers with consultation and guidance by telephone once a week. If mothers did not have a telephone, the researcher gave them a telephone card for communication and to made an appointment for the first follow-up 2 weeks after discharge at the Outpatient department of Pediatrics.

2.2 Two weeks and six weeks after discharge at the Outpatient department of Pediatrics.

1) The researcher recorded the growth and assessed the development of premature infants.

2) The researcher assessed problem and demands of the mother about premature infant care individually or in groups (2-3 persons). The mothers could exchange experience together.

3) The researcher gave the mother knowledge follow the supportive-educative nursing system plan, anticipatory guidance and at the same time made an appointment for the next follow up.

2.3 Fourteen weeks after discharge at the Outpatient department of Pediatrics.

1) The researcher recorded the growth, assessed the development of premature infants and completed data. At the same time the mother answered the Mother's Dependent-care Agency Questionnaire Form and Pridham's Perceived Infant temperament questionnaire by the research assistance.

2) The researcher assessed problems and demands of the mother about premature infant care individually or in a group. (2-3 persons). The mothers could exchange experience and their doubt together.

3) The researcher gave the mother knowledge follow the supportive-educative nursing system plan, anticipatory guidance and conclusion to the mother.

1.2 The handbook of caregiving of premature infant.

This handbook was created by the researcher. It was given to the experimental group on the first day. The handbook composed contents related to premature infants, characteristics, daily care of the premature infants at home, breast feeding, behavior of premature infants, proper development, assessment and stimulation of development, growth, health problem of premature infants, the necessity to have follow up visits by the doctor, vaccination, method of giving medicine, arrangement for a proper environment at home and protecting her premature infant from accidents.

Validity

The supportive-educative nursing system plan and the handbook of caregiving of premature infant were tested for content validity by 5 experts (Appendix A); one pediatrician, two pediatric nursing educators and two registered nurses in pediatrics nursing, to be provided with recommendations concerning the appropriateness of the contents, the language suitability and the illustrations. The researcher has adjusted the contents again after having been instructed by the experts and tested it with the mothers of premature infants (under the same characteristics of the sample group) 5 cases, for evaluation, suggestions and testing on the simplicity of language. Then, it was adjusted again before final checking by experts and used to the instruments for the experimental group.

2. Data collecting instruments included

2.1 Personal data form: consisting of 2 parts

The first part consisted of sociodemographic data, the basic personal data of the mothers including age, educational level, religion, occupation, family income, number of person in family, number of infants, complications during pregnancy, past illness, type of delivery.

The second part was sociodemographic, the basic personal data of the premature infants consisting of sex, number of birth, gestational age, date of birth, Apgar score, body weight, body length, head circumference at birth, length of stay in

the hospital, complications after birth, ages at discharge, body weight, body length, head circumference and signs of premature infants on discharge day. All personal data form of 2 parts were collected by the researcher.

2.2 Growth and development Assessment form: this instrument consists of

2.2.1 Growth assessment instrument include infant's bodyweight scale in grams, body length scale equipment-measuring board, its reading scale in centimeters and tape for measuring head circumferences in centimeters. The same tape was used throughout the research.

All instruments passed the standard check with calibrated and approved for use in the premature unit and Outpatient department of Pediatrics already.

2.2.2 Development assessment instrument. In this study the researcher assessed development of premature infant by Denver II (Denver Developmental Screening test) on the follow-up day after the premature infant was discharge at 14 weeks. The instrument of Denver II composed of : a red yarn pom-pom, a small bell, raisins, a rattle with a narrow handle, 10 colorful cubes size 1-inch square, and a plastic cup with handle.

Regarding the quality of Denver II, it has been revised from the Denver Developmental screening test (DDST) by Frankenberg and colleagues in 1990, it was substantially revised, re-standardized and renamed. Denver II is most widely used to assess the development of children from birth to age 6 years with-125 items in the four categories of Personal-social, Fine Motor Adaptive, Language and Gross Motor. It was translated into Thai by Nittaya Kotchabhakdi and Orapin Laosuwanpong (B.E. 2542) and adapted 3 items to appropriate the language, social conditions and culture of Thailand.

To evaluate developmental milestone 125 items are arranged on an age scale that conforms to the American Academy of Pediatrics (AAP) Health Supervision Visit Schedule for newborn to children age 6. Pass, fail or refusal scores are assigned to an item. Each items performance is interpreted in relation to children's ages, as delay, caution, no opportunity, normal or advanced performance. One caution

or normal produce normal overall test score, whereas one delay and/or two or more cautions result in a suspect score.

There are 2 major phases in the reliability training of the examiner using the Denver II. First of all, the researcher has to be trained by an expert child development pediatrician from Ramathibodi Hospital in order to study the assessment criteria in the Denver II assessment, then he has to attend the orientation session at the outpatient department of Pediatrics in Ramathibodi Hospital. After acquiring the skills, the researcher is tested to use Denver II with 13 infants, then demonstrated the interater observers reliability of assessment with experts until correct in all steps to 100%.

2.3 The Mother's Dependent-care Agency Questionnaire Form: the researcher used Self-Care Agency : Form A created by Evers and others (1986, cited by Somchit Hanucharunkul, B.E. 2540: 306) translated in to Thai by Somchit Hanucharunkul to measure the performance of self-care agency for responding to universal self care requisities in normal conditions and in sickness and to reflect on power components inclusive of the foundational capability and disposition by applying this instrument with various sample groups such as patients with cancer, SLE, aging people, mothers and children. The researcher applied the measuring from Manee Kuprasit (B.E. 2539: 92) to be adjusted for the sample group who are the mothers of premature infants. It consisted of 26 questions including 18 positive questions (number 1, 2, 4, 5, 6, 7, 9, 13, 14, 15, 16, 18, 19, 21, 22, 23, 24 and 26). The negative questions included 8 items (number 3, 8, 10, 11, 12, 17, 20 and 25). The answer in Likert type scale are in 5 levels, the statement most corresponding to the mother will be given a 5 score and not responding 1 score the negative contents shall be reversed. Total scores are between 26-130. A high score means high capability.

The quality of instrument:

The Appraisal of Self-care Agency by Evers and others (1986) encompassed content validity by Orem and experts in Self care theory and translated and composed into Thai with adjustment on questioning by Somchit Hanucharunkul and applied to various sampling groups. They are found to have confidence scores by

Cronbach's alpha of which the result was .78 - .94. Manee Kuprasit (B.E. 2539) adapted to study on the self-care agency of the father and mother of the children 0-5 years 120 cases are calculated for the reliability with Cronbach's alpha with the result was .93. The researcher has adapted and applied this questionnaire to appropriate the sample group before presenting it to the groups of 5 experts for validating and its accuracy in contents and language before its further adaptation, and in the samples 10 cases with Cronbach's alpha the result was .87 then it was used for the total samples of 54 cases the result was .89.

2.4 The infant temperament questionnaire:

The researcher used Pridham's Perceived Infant temperament (1994), which is named What My Baby Is Like (WBL) developed by Pridham, Chang & Chiu, (1994: 381-392). This instrument was translated into the Thai language by Phumonsakul. (2000: 91) It assesses the parents' perception of 11 dimensions of very young infants. These dimensions included the Nine New York Longitudinal Study (NYLS) dimension consist of positivity of mood, rhythmicity, responsiveness or sensitivity to stimuli, activity, approach to new things, adaptability, intensity of reaction, distractibility, persistence, cuddliness and soothability.

The instrument consisted of 19 items and nine point rating scale graphed. The range of possible score is 1-9 for each item. The items member 1, 12 and 13 were negative items which were reversed the received scores before summation of the total scores. The item number 2 was not analyzed, then the possible score of the WBL range from 18-162, the higher the score the higher adaptability and proper temperament the infant has.

The quality of instrument

The constructed validity of this instrument was tested by factor analysis in a three step strategy among the infant's mothers at 1 week (n = 100), 1 month (n = 136) and 3 months (n = 152). The infants' characteristics components obtained with a four-factors analysis, accounted for more than 59.7% of the variance among the three administration of the WBL. (Pridham, Chang & Chau, 1994: 384). The instrument was translated into Thai language by Phumonskul (2000). The content validity of

WBL was done by six expert in maternity and pediatric nursing including linguistic experts. The constructed validity was tested by factor analysis in 201 working primiparous mothers, the cumulative proportion of variance explained was 59.3%. The reliability of this instrument was tested among 201 subjects. The results show that the Cronbach's Alpha coefficient was .66. Thongsawan (2000) tested the internal consistency of the instrument, the Cronbach's alpha coefficient was .69 when tested in 120 postpartum women.

In this research, the researcher presented this instrument to the groups of 5 experts for validating and its accuracy in contents and language appropriate to the sample group before its further adaptation. The researcher selected 10 mothers of premature infants who met the sample criteria to test the internal consistency of the instrument the Cronbach's alpha coefficient was .73 and .76 when tested in the total sample of 54 cases.

Preparation for research assistant

In this study has research assistant, instructed to be able to collect data with reading by the assistant, to create an understanding in each question between the researcher and the assistant. In this collection of data, the assistant was the person who collected the Mother's Dependent care Agency Questionnaire Form and Infant temperament questionnaire at 14 weeks after discharge and was able to accurately answer questions of the sampling group in associated to the questionnaire.

Data collection

Data collection started after permission from the Faculty of Graduate Studies, Mahidol University, according to the following steps:

1. The introduction letter issued by the Faculty of Graduate studies, Mahidol University was sent to the Director of Queen Sirikit National Institute of Child Health and the Director of Medical office of Bangkok Metropolitan asking for their cooperation in the collecting of data.
2. After getting the approval, the researcher met with the supervisor nurses, head nurse of Premature Infant unit and head nurse of Outpatient department of Pediatrics to explain the research details and the collection of data.

3. The researcher identified the sample according to inclusion criteria and the doctor had planned to discharge through the study of their medical records.

4. The researcher met the mothers and explained research objective to them with a request for their participation. When they agreed to participate in this study, the researcher assured them human right in signing consent (Appendix B).

5. The first thirty-six mother-infant dyad were assigned to the control group; the later thirty-two were assigned to the experimental group. The researcher took the initiative in collecting the data of the experimental group after the last infant of control group was discharged.

The control group received usual nursing care by nurses until they were discharged. On the discharge day, the researcher collected personal data from the medical records, interviewed mothers and measured the growth of the premature infants for 15 minutes. Then, the researcher made an appointment to meet them on a follow up day, 14 weeks after discharge.

On the follow up day, the researcher measured the growth of premature infants, assessed development and recorded at the same time the mothers answer to the Mother's Dependent-care Agency Questionnaire Form and the infant temperament Questionnaire with the research assistance. They were given the handbook of caregiving of premature infant and answered their problem about infants care by the researcher.

The experimental group received usual nursing care by nurses and the supportive-educative nursing system plan by the researcher. (Appendix C). This plan consisted of 60 minutes to each mother on the 3 days before the premature infant was discharged. It comprised the building of relationships at the same time evaluating demands and problems, teaching activity, giving of information, giving the handbook of caregiving of premature infant, guiding, supporting and managing the environment. It followed step for plan until premature infants discharge. On discharge day, the researcher make an appointment for the first follow-up 2 weeks after discharge at the Outpatient department of Pediatrics and provided the mother with consultation and guidance by telephone once a week.

On the follow up day at 2, 6 and 14 weeks after discharge at the Outpatient department of Pediatrics, the researcher recorded growth, assessed the

development of the premature infant and assessed problems and demands of the mother about premature infant care, gave information, skill and anticipatory guidance. The last appointment was 14 weeks after discharge. The mother answered the Mother's Dependent care Agency Questionnaire Form and the infant temperament Questionnaire with research assistance

6. After that, the researcher collected data for statistical analysis

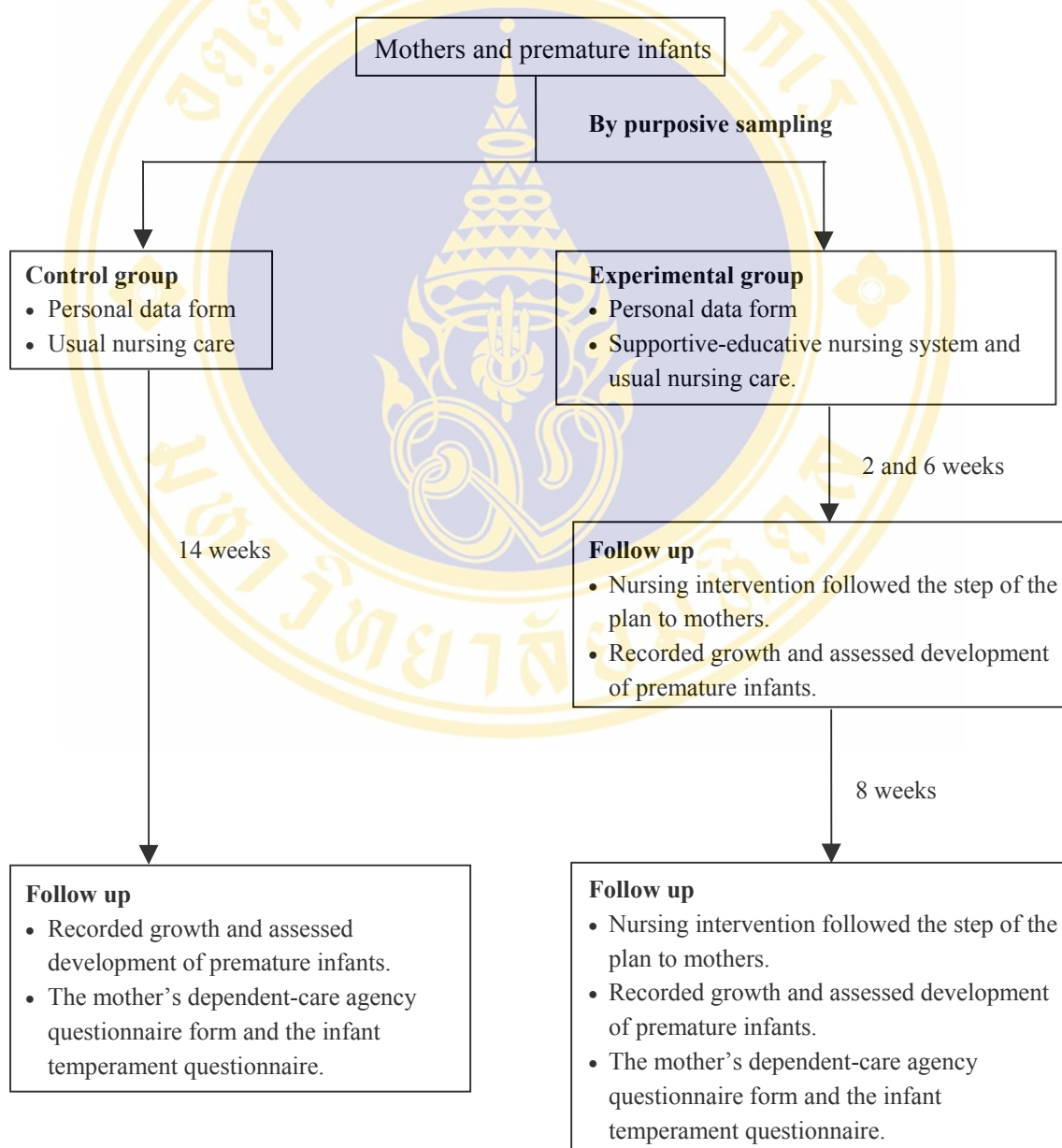


Figure 2 The process of data collection.

Data analysis

By using Statistical Package for the Social Science for Windows: SPSS program according to the following steps.

1. Comparing the personal data of the sample group by grouped t-test and Chi-square test.
2. Analyze the difference of mother's dependent-care agency scores between the experimental and the control groups by the grouped t-test.
3. Analyze the difference of growth of the premature infant between the experimental and the control groups by the grouped t-test.
4. Analyze the difference of development of the premature infants between the experimental and the control group by Chi-square test.
5. Analyze the difference of infant temperament scores between the experimental and the control groups by the grouped t-test.

CHAPTER IV

RESULTS

This study was a quasi-experimental research to determine the effects of supportive-educative nursing system on mothers' dependent care agency, growth development and temperament of premature infants between the groups of control and experimental groups. In this chapter, the results of the data analysis are presented into 2 main parts:

Part 1: The descriptive data of the sample groups.

1.1 The characteristics of the sample groups

Part 2: The results of hypothesis testing

2.1 The results of hypothesis 1

2.2 The results of hypothesis 2

Characteristic of the samples

The collection of data was carried out during September 2000-April 2001 with the mothers and their premature infants. The total 54 subjects for study in which 28 subjects were the control group, 26 subjects were the experimental group. The mothers of premature infants ranging in age in both groups from 17-36 years with the average of 27.75 in the control group and 25.54 in the experimental group. Their education level was 6-16 years and their family incomes in both groups ranging from 4,000-25,000 baht, with the average of 8,214.25 and 8,076.92 in the control and experimental group respectively. The percentage of primiparity and multi-parity from the control group were 50.0 and 50.0 in the experimental group were 65.4 and 34.6 respectively. The majority of them with a percentage of 78.6 and 73.1 in the control and experimental group respectively were nuclear families.

In both groups, the premature infants had gestational age of 32-35 weeks. The growth of the experimental group included body weight between 1,300-2,000 grams with an average of 1,712.69 grams, body length about 40-46 centimeters with an average of 42.31 centimeters and head circumference between 28-32 centimeters with an average of 30.29 centimeters. The growth in the control group included body weight between 1,250-2,000 grams with an average of 1,668.57 grams, body length 38-48 centimeters with an average of 42.29 centimeters and head circumference between 27-31 centimeters with an average of 29.18 centimeters. The ages of premature infants at discharge day ranging from 35-41 weeks, with the average of 37.42 in the experimental group and 37.07 in the control group. The growth of the experimental group at discharge included body weight between 1,750-2,300 grams with an average of 1,959.67 grams, body length about 42-47 centimeters with an average of 45.54 centimeters and head circumference between 31-33 centimeters with an average of 31.23 centimeters. The growth of the control group at discharge include body weight between 1,800-2,480 grams with an average of 1,991.61 grams, body length about 41-48 centimeters with an average of 45.07 centimeters and head circumference between 31-34 centimeters with an average of 31.57 centimeters. When comparisons of the personal data of the sample groups with the grouped t-test and Chi-square test found that they were not statistically significant different ($p > .05$) as shown in Table 3, 4 and 5.

Table 3 Comparison of characteristics of the mothers between the sample groups by t-test.

Characteristics	Control group (n=28)			Experimental group (n=26)			t
	Min-Max	Mean	SD	Min-Max	Mean	SD	
Age (years)	17 - 36	27.75	5.94	17 - 35	25.54	5.30	-1.44 ^{ns}
Education (years)	6 - 16	10.07	3.27	6 - 16	10.27	2.93	0.23 ^{ns}
Family income per month (baht)	4,000-25,000	8,214.29	4,946.81	4,000-25,000	8,076.92	4,698.28	-0.10 ^{ns}

^{ns} $p > .05$

Table 4 comparison of characteristics of the mothers between the sample groups by Chi-square.

Characteristics	Control group		Experimental group		χ^2
	(n=28)		(n=26)		
	n	%	n	%	
Number of pregnancy					1.31 ^{ns}
- Primipara	14	50.0	17	65.4	
- Multipara	14	50.0	9	34.6	
Type of delivery					1.19 ^{ns}
- NL	12	42.9	15	57.7	
- C/S	16	57.1	11	42.3	
Occupation					1.03 ^{ns}
- Housewife	18	64.3	20	76.9	
- Office	10	35.7	6	23.1	
Type of family					0.22 ^{ns}
- Nuclear	22	78.6	19	73.1	
- Extended	6	21.4	7	26.9	

^{ns}p > .05**Table 5** Comparison of characteristics of the premature infants between the sample groups by t-test.

Characteristics	Control group (n=28)			Experimental group (n=26)			t
	Min-Max	Mean	SD	Min-Max	Mean	SD	
Gestational age (weeks)	32-35	34.18	0.94	32-35	34.23	1.03	0.19 ^{ns}
Body weight (grams)	1,250-2,000	1,668.57	205.84	1,300-2,000	1,712.69	194.47	0.81 ^{ns}
Body length (centimeters)	38-48	42.29	2.46	40-46	42.31	3.26	0.03 ^{ns}
Head circumferences (centimeters)	27-31	29.18	1.22	28-32	30.29	2.73	1.95 ^{ns}

Table 5 Comparison of characteristics of the premature infants between the sample groups by t-test. (cont)

Characteristics	Control group (n=28)			Experimental group (n=26)			T
	Min-Max	Mean	SD	Min-Max	Mean	SD	
Gestational age at discharge (weeks)	35-41	37.07	2.29	36-40	37.42	0.95	0.73 ^{ns}
Body weight at discharge (grams)	1,800-2,480	1,991.61	188.18	1,750-2,300	1,959.67	149.65	-0.69 ^{ns}
Body length at discharge (centimeters)	41-48	45.07	1.80	42-47	45.54	1.27	1.09 ^{ns}
Head circumferences at discharge (centimeters)	31-34	31.57	0.79	31-33	31.23	0.71	-1.66 ^{ns}

^{ns}p > .05

The results of hypothesis testing

Hypothesis I The experimental group will have dependent-care agency of the mothers scores higher than the control group at 14 weeks after discharge.

The dependent care agency of the mother scores at 14 weeks after discharge in the control group was 92-125 with the average of 104.79. But the experimental group was 93-127 with the average of 116.73. These show the experimental group had higher score than the control group. After bringing the average scores of the two groups into analysis by the grouped t-test, the result showed that the experimental group had dependent-care agency of mother scores at 14 weeks after discharge higher than the control group with statistically significant ($t = 4.76$, $p < .01$) as shown in Table 6. So, the results supported hypothesis 1.

Table 6 Comparison of Dependent-care agency of mother scores between the sample groups at 14 weeks after discharge by grouped t-test.

Sample groups	Min-Max	Mean	SD	t
Control group	92-125	104.79	9.83	4.76**
Experimental group	93-127	116.73	8.48	

**p < .01

Hypothesis II: The experimental group will have better growth, development and temperament of premature infants than the control group at 14 weeks after discharge.

The growth of premature infants at 14 weeks after discharge included body weight, body length and head circumference and found that the control group had body weight from 4,000 – 6,200 grams with the average of 5,260.71 grams and the experimental group has body weight from 5,200 – 6,200 with the average of 5,780.77 grams. On body length, the control group had from 51-61 centimeters with the average of 55.57 centimeters and the experimental group had from 55-61 centimeters with the average of 58.31 centimeters. On head circumference the control group had from 36-41 centimeters with the average of 38.43 centimeters and the experimental group had from 38-43 centimeters with the average of 39.69 centimeters. These show that the experimental group had a higher growth than the control group. When comparing the average scores of both groups by the grouped t-test, it was found that the growth in the experimental group was higher than the control group with statistically significant ($t = 4.13, 5.65$ and 4.23 respectively, $p < .01$) as shown in Table 7. So, the results support hypothesis 2.

Table 7 Comparison of growth (body weight, body length and head circumference) of the premature infants between the sample groups at 14 weeks after discharge by grouped t-test.

Growth	Control group (n=28)			Experimental group (n=26)			t
	Min-Max	Mean	SD	Min-Max	Mean	SD	
Body weight (grams)	4,000-6,200	5,260.71	600.21	5,200-6,200	5,780.77	277.16	4.13**
Body length (centimeters)	51-61	55.57	2.3	55-61	58.31	1.09	5.65**
Head circumference (centimeters)	36-41	38.43	1.14	38-43	39.69	1.05	4.23**

**p < .01

The development of the premature infants at 14 week after discharge was assessed by the Denver Developmental screening test and it reported the number of normal and suspect premature infants in each group. The result found that the control group had 17 normal and 11 suspect premature infants, the experimental group had 23 normal and 3 suspect premature infants. These showed that the experimental group had more premature infants with normal development than the control group. When comparing the number of normal and suspect premature infants between both groups by Chi-square test, it was found that the development in the experimental group was different from the control group with statistically significance ($\chi^2 = 5.40$, $p < .05$). The experimental group has more proper development than the control group as shown in Table 8. So, the results support hypothesis 2.

Table 8 Comparison of development of the premature infants between the sample groups at 14 weeks after discharge by Chi-square test.

Sample groups	Development				χ^2
	normal		suspect		
	n	%	n	%	
Control group	17	60.7	11	39.3	5.40*
Experimental group	23	88.5	3	11.5	

*p < .05

The temperament of the premature infants at 14 weeks after discharge was measured by What My Baby is Like (WBL). In the control group it was 80-138 with the average of 107.75. But the experimental group was 99-141 with an average of 124.65. These showed that the experimental group had higher scores than the control group. After bringing the average score of the two groups into analysis by the grouped t-test, the result showed that the experimental group had higher temperament scores at 14 weeks after discharge than the control group with statistically significant ($t = 4.33$, $p < .01$) as shown in Table 9. So, the results supported hypothesis 2.

Table 9 Comparison of the infant temperament scores between the sample groups at 14 weeks after discharge by grouped t-test.

Sample groups	Temperament			T
	Min-Max	Mean	SD	
Control group	80-138	107.75	17.02	4.33**
Experimental group	99-141	124.65	10.71	

**p < .01

CHAPTER V

DISCUSSION

This research was a study on the effects of supportive-educative nursing system on mothers' dependent-care agency, growth, development and temperament of premature infants at Queen Sirikit national Institute of Child health and Bangkok Metropolitan administration Medical college and Vachira hospital with the number of the sample 54 cases, divided into experimental and control groups were composed of 26 and 28 premature infants respectively. The characteristics of the sample groups and tested results of the hypothesis are discussed as follows.

Characteristics of the Sample groups

The mothers of premature infants ranging in age in both groups from 17-36 years, the fertility age for having children. In both groups their education level was 6-16 years and their family incomes ranging from 4,000-25,000 baht. The type of family in both groups were almost nuclear family. The control group had more experience infant care than the experimental group; such experience may have certain effects on their decision-making and operation in infant care and preparation and adaptability better state than those without experience (Somchit Hanucharunkul, B.E. 2540: 54). In both groups premature infants had gestational age of 32-35 weeks, when comparison of growth at birth and growth at discharge between the sample groups by grouped t-test founded that they were not statistically significant different ($p > .05$).

The characteristics data included basic factors already mentioned that may influence mothers' dependent-care agency, growth, development and temperament of the premature infant. The researcher compared characteristics data from both groups by grouped t-test and Chi-square test and found that they were not statistically significantly different ($p > .05$) as shown in Table 3, 4 and 5.

Testing Results of Hypothesis

Hypothesis I The experimental group will have the dependent-care agency of the mothers scores higher than the control group at 14 weeks after discharge.

The research result showed that the experimental group had the dependent-care agency of mother scores at 14 weeks after discharge higher than the control group with statistically significant ($p < .01$) as shown in Table 6. To develop dependent-care agency of the mothers to care their infants related to many factor such as age of mother, family incomes, education level, experience infant care, family resources and type of family. (Somchit Hanucharurnkul, B.E. 2540: 51-54; Srisopa Tangtongkum, B.E. 2543: 79; Ruth, 1973: 136 cited by Yupaporn Pongsing, B.E. 2541: 33). Further more, the data of the present study showed that the characteristics data included basic factors that may influence the dependent-care agency of the mother in the sample groups not statistically significant different ($p > .05$). This resulted from through the supportive-educative nursing system to developing mothers' dependent-care agency. Its creation of relationships, giving knowledge, guiding, supporting and managing the environment to promote developing mothers' dependent-care agency, which made the mothers enhance their knowledge, skill, self-confidence in their maternal role, building confidence in making decisions and operation in infant care.

The researcher added supportive educative nursing system to the mothers in the experimental group, by operating the following steps of the plan that follows.

1. Creating relationships: The researcher has built up friendly relationships with the mothers of premature infants, at the same time evaluating demand, problems, and designating goals together and assessing their readiness on the each day followed plan. Friendly relationships enabled the mothers in the experimental group to pay on attention, trust and to express their doubts, helping them to understand the demands and cues of the premature infant.

2. Giving knowledge or teaching: After creating relationships, the researcher designates goals together before teaching. Orem (1995: 19) said that the teaching process according to the individual's requirement will help develop

knowledge and skill. Teaching is the valid method to assist the mothers of premature infants to develop the necessary knowledge and proper skills, which is the most important thing to develop mothers' dependent-care agency. The learning must to think about the knowledge that the mothers need to learn to supplement their existent knowledge and assessment the state of readiness to learn (Orem, 1995: 19) and their experience. The researcher taught to the mother individually according the nursing plan. The mother learned and practiced the skill of infants care at the hospital before discharge. The mother received the handbook of caregiving of premature infant from the researcher. The handbook is a collection of simple instructions for their own use when the mothers are faced with difficult problems. Their situation after discharge and in caring for the infant will be the best stimulant in urging the mother to use the knowledge and skill that she has learned. The study of Nongnuch Vithayachockitkhun (B.E. 2536: 66) studied the group of mother after delivery under the supportive-education nursing system by giving them a manual on breast feeding and teaching by Flow chart. The experimental group was found to achieve a higher score in the operation of breast feeding than the control group with statistically significant ($p < .001$). This is consistent with the study by Tudsuang Pounyathalung (B.E. 2541: 54) who studied the group of mothers with primigravida cases under the supportive-educative nursing system by giving them a manual on self-care performance and infant care. The experimental group was found to achieve higher self-care agency and dependent care agency scores than in the control group with statistically significant. ($p < .005$). And, the study of Rungtiwa Wangruangsatid (2000, 87) who studied the effect of a mother preparation program in caring for premature infants after hospital discharge using the sound slide, the handbook and practicing on mother's knowledge and behavior. The study assessed mother's knowledge score after attending the program was significantly higher than the score before attending the program ($p < .001$)

3. The guiding and supporting is an encouraging method that reinforces the mothers' confidence to choose the method to care for premature infants by themselves. The researcher provided suggestion, empowerment and support. Orem (1995: 16-17) has stated that guiding another person is considered as a method of assisting is valid in situations in which person must make choices and persue a course

of action by herself through support from nurses. This research found that after the mother was informed and had skills to care for her premature infant through teaching, and demonstration from the researcher, she preferred to practice her skills: bathing, breast feeding and caring for her premature infant by herself. This was assisted and reinforced by the researcher. To supporting the mother, Orem (1995: 17) has stated that to support another person means to sustain in an effort and thereby prevent the person from failing or from avoiding an unpleasant situation or decision. The mother must be capable of controlling and directing the action in the situation once psychological or physical support has been received. In this study, the researcher supported the mother by empowering her, by stimulation and answering the problems of caring for her infant, she can express her doubts and the researcher can provide essential resources to the mother. This process encouraged self-confidence, and developed dependent-care agency of the mother to choose the appropriate method of infant care.

4. Managing environment: This method requires the nurses to provide environmental conditions that motivate the person being helped to establish appropriate goals and adjust behavior to achieve the results specified by the goals (Orem, 1995: 18). In this study, the researcher developed the dependent-care agency of the mothers by arranging a quiet room to learn and practice skills individually, by providing them with an instruction handbook, by teaching and demonstrating how to take care of their premature infants. The mothers practiced caring for their infants and to asked about anything they didn't understand. The researcher found that the experimental group were keen to learn and interested to practice their skills in caring for their infant. They could express their anxieties, and their doubts and changed their idea about breast-feeding and bathing their premature infants by themselves. Because the premature infant has such a small body, the mother felt that she could not hold her infant, and that breast-feed was not adequate for her infant. When the mothers were discharged from the hospital, the researcher made follow-up visits by telephone, regarding their problems. It was found that in the first week after discharge, the mothers felt anxieties and had problems in caring for their infants. There were twenty-two mothers who made calls to the researcher in the first week to ask question about feeding, abdominal distention, regurgitation, constipation, diarrhea, sleeping,

breathing, erythematotoxicum and crying. Several studies (Brooten, 1988: 213, Ladden, 1990: 620; Mc. Kim, 1993: 89) reported that mothers of premature infants faced a time of high levels of stress and had many problems caring for their infants at the time at the early post discharge at home. At follow-up day, 2, 6 and 14 weeks after discharge the researcher made an appointment with the group of 2-3 mothers to assess problem, demands and receive guidance. The mothers preferred to exchange experiences among the group of mothers and the researcher.

The conclusions were the supportive-educative nursing system plan, which based on the supportive-educative nursing system, administered to the experimental group 3 days before discharge until 14 weeks after discharge could enhance their knowledge, skill, self-confidence in infant-care. It developed mothers dependent-care agency. So, the dependent-care agency scores in this experimental group was higher than the control group with statistically significant ($p < .01$), which was consistent to the study by Tudsung Pounyathalang (B.E. 2541: 53), which studied a group of primigravida mothers under the supportive-educative nursing system by giving them the manual on self-care performance and helping them with infant care in the experimental group found the self-care agency and dependent-care agency scores were higher in the experimental group than in the control group with statistically significant ($p < .005$). And the study by Suwannobol (2000: 92) found that the group of the mothers of premature infants under the supportive-educative nursing system by giving them the supportive-educative nursing system plan and manual care in the experimental group. The dependent-care agency scores in the experimental group was higher than in the control group with statistically significant ($p < .01$).

Consequently supportive-educative nursing system plan based on the supportive-educative nursing system is an effective nursing intervention plan to developed mothers' dependent-care agency. The finding in this study supports the accurateness of Orem's theory, proving that the nursing system was the essential factor in developing dependent-care agency.

Hypothesis II The experimental group will have better growth, development and temperament of premature infants than the control group at 14 weeks after discharge.

The research result found that the experimental group had higher growth, proper development and higher temperament scores at 14 weeks after discharge than the control group with statistically significant ($p < .01$, $p < .05$ and $p < .01$) (Table 7, 8 and 9).

This hypothesis test is an assessment of the result of supportive-educative nursing system, which helped the mother to care for her infant by responding to therapeutic self-care demand and by improving the maximum potential of the infant. The infant has proper growth, development and temperament.

In this study the growth measurement of premature infants is evaluated from body weight, body length and head circumference. A sample similar in characteristic data included; Gestational age, body weight, body length and head circumference at after birth and before discharge. ($p > .05$) (Table 5) and the result of the study at 14 weeks after discharge found that the experimental group had higher average scores of body weight, body length and head circumference than the control group with statistically significant ($p < .01$) (Table 7).

In general, the premature infants of more than 34 weeks gestation who are appropriate for gestational age will tend to grow at the same rate as a full term infant of the same post conceptional age. (Blackburn, 1985: 47). The sample groups in this study had average gestation ages of 34 weeks at birth, and 37 weeks at discharge. When, the end of study 14 weeks after discharge, the sample groups average gestation age was 51 weeks or 11 weeks of corrected age, which on the fourth phase of growth called homeorrthesis. The fourth phase of growth is characterized by patterns that closely parallel the growth seen in standard growth charts, that begin at approximately 48 weeks (Manser, 1984: 23-25) when the growth rates were plotted according on Babson's fetal-infant growth chart (Babson, 1970 cited by Manser, 1984: 23), the growth of the experimental group was above mean on body weight, and equal to mean on body length and head circumference (Figure 5) whereas the growth of the control group including body weight, body length and head circumference were under mean. That is difference between both groups. The factor that influenced to increase in growth were best nutritional, health status and environmental mileu. (Manser, 1984: 25; Dusick, 1997: 169; Klaus & Franaroff, 1993: 460).

In this study the researcher provided the supportive-educative nursing system plan to the mothers in the experimental group. That developed the mother's capability in learning and understanding about the premature infants care particularly breast feeding, nutrition, behavior of premature infant, assessed growth, health problems and arrangements for proper environment at home. The mother can respond to the needs of the premature infant which enhances her self-confidence to care for her infant. The researcher found that, the mother had concerned that, their infants were sleeping all they time such as saying "My baby is sleeping all time the day. Can I wake her to feed?", and other problems; crying, amount of feeding, slowly sucking, fever, vomiting, loose stool, constipation, proper time to massage and proper development. The mothers asked these questions, when the researcher follows up by telephone and at the meeting on the follow-up day. Because the mothers in the experimental group, who received supportive-educative plan, had knowledge and skills they could solve their problems about their infants' care. They can enhance their self-confidence, bring their knowledge and skill and decision-making to care for their premature infants correctly. This increased the growth of premature infants in the experimental group more than the control group.

This results are consistent with the study of : Suwannobol (2000: 97) who studied the effects of supportive-educative nursing system on anxiety, dependent-care agency of the mothers and growth of the premature infants. The result found that the growth of the premature infants in the experimental group were significantly higher than in the control group ($p < .05$). The study of Wangruansatid (2000: 93) who studied the effect of maternal preparation on knowledge and caregiving behaviors towards premature infant after discharge. The results found that the mothers who had almost correct behavior, the infants' weight gains were equal to the standard and higher than the standard.

Consequently the supportive-educative nursing system is an effective nursing activities to increase growth of premature infant.

In this study the development of premature infants was assessed by Denver Developmental Screening test (Denver II) on the follow-up day after the infants' discharge 14 weeks. The results of the study showed that the experimental group had 23 normal and 3 suspect premature infants, which is 88.5% and 11.5% respectively,

the control group had 17 normal and 11 suspect premature infants, which is 60.7% and 39.3% respectively. When comparing the number of normal and suspect premature infants between both groups by Chi-square test, it was found that the development in the experimental group was different from the control group with statistically significant. ($p < .05$) (Table 8). So, the experimental has more proper development than the control group.

This could be explained as follow: the mothers in the experimental group who received supportive-educative nursing system, that the researcher gave information and demonstrated of developmental support for the infant. Mothers received the handbook of caregiving of premature infant for revision at home. At the follow up day 2, 6 and 14 weeks after discharge, the researcher assessed development of premature infant and advised the mothers about stimulating development, anticipatory guidance and the other problems that the mother wanted to know. The mothers could call the researcher, if they had problems about caring for their infants or about the infants health. This process increased their self-confidence and they had the ability to make good decisions in caring for their premature infants. The experimental group had more proper development than the control group.

According to the study of Pornpimol Chandanasotthi (B.E. 2535: 104) who studied the comparative study of infant development between mothers who received and not received early intervention teaching at maternal and child hospital of the health promotion center region 7 Ratchaburi province. The result found that the mean score of the behavior of early intervention and the infant development scores, the experimental group was higher than the control group with statistical significant at .001 and .05 respectively. The study of Tinikul (2000: 107) who compared the growth and development of premature infants in the control group and the treatment group under the multi modalities sensory stimulation program. The result founded that the development of infants in the treatment group was more advanced than the control group with statistical significant at ($p < .05$, $p < .01$ and $p < .001$). Many studies found that maternal behaviors in promoting infant development properly were related to infant development (Jumras Pinhean, B.E. 2536; 72; Landry, et. al., 1998: 105-123; Pornpimon Chandanasotthi, B.E. 2535: 104; Supanat Suwannagit, B.E. 2539: 65). From the result of this study it can be conclude that the mothers of premature infants

in the experimental group who received the supportive-educative nursing system plan have knowledge and skill to care, in promoting infant development. They can enhance their premature infants development.

In this study the temperament of premature infant was measured by What my Baby is Like (WBL) on the follow up day after infant discharge at 14 weeks. The result showed that the experimental group had higher temperament scores than the control group with statistical significant ($p < .01$) (Table 9).

Chess and Thomas (1986) stated that the infant's temperament influenced the dynamic interactions between the infants and other people in their environment, particularly parents and other family members. They had explained the interaction between the infant and the environment by the model of "goodness of fit" and "poorness of fit" (Bowden, et. al., 1998: 181-182). Goodness of fit occurs when the environmental expectation and demands of the caregiver are consonant with the infant's temperamental characteristics. Conversely poorness of fit is characterized by dissonance between environmental demands and the infant's capabilities and temperament style (Chapieski & Evankovich, 1997: 225). The infant's temperament characteristics are the presence of a good fit in the interactions of the infant with the environment. The premature infants' cues are different from the healthy infant and they had decreased responsiveness to social stimulation, during the first year of life. The mothers often cannot understand infants' cues, cannot respond to infants' needs, holding, looking, smiling to their infants less and have poor attachment. (Leifer, et al., 1972 cited by Chapieski & Evankovich, 1997: 226). In this study the mothers in the experimental group, received the supportive-educative nursing system. The researcher had assessed demand and designated goal to care their infants. They were taught about the behavior of premature infants that was different from full-term infants, and how to respond appropriately infants' cues. After they were discharged at home, when the mothers had problems about infants' cues: for example crying for long periods with loud noise, sleeping all the time, not responding to the mother, they could call to ask the researcher about these questions or they could ask them on the follow up day. The mothers in the experimental group could understand the infants' cues, could have appropriate response to infants' needs and good attachment. The mothers and their infants had good interaction or had "goodness of fit" between them. For these reasons,

the temperament scores of the experimental group were higher than the control group with statistical significant ($p < .01$).

According to the study of Achenbach, et. al., (1990: 1670-1681 cited by Miles & Davis, 1997: 259) who studied the seven year outcome of the Vermont intervention program for low birth weight infant. The program was design to enable the mother to appreciate the infant's specific behavioral and temperamental characteristics, sensitize her to the infants' cues and teach her to respond appropriately to cues. It was implemented by a neonatal nurse in the hospital before discharge and in the home after discharge. Outcomes increased maternal self-confidence, satisfaction with mothering and maternal perceptions of infant temperament. Parker and other (1992: 780-785) studied the effect of interventions of mother-program based in the neonatal intensive care unit. Outcomes improved mothers' interactions with their preterm infants 4 to 8 months following discharge. There were many studies about intervention programs have been developed to help parents learn to manage the temperament of their infants, which of the first goal is to help parents understand the characteristics of their infants. (Gross & Conrad, 1995; Mc. Clowry, 1995; Medoff-Copper, 1995; Melvin, 1995; Wallace, 1995 cited by Bowden, et. al., 1998: 183).

Finally it can be concluded that the effectiveness of supportive-educative nursing system can help mothers to develop dependent-care agency of the mothers and enhance the growth, proper development and temperament of premature infants.

CHAPTER VI

CONCLUSION

This study is a quasi-experimental research designed aimed to determining the effects of supportive-educative nursing system on mothers' dependent-care agency, growth, development and temperament of premature infants. The sample groups were the mothers of premature infants and their infants who admitted at the Premature infants units and follow up at Outpatient department of Pediatrics at Queen Sirikit National Institute of Child Health and Bangkok Metropolitan administration Medical College and Vachira Hospital. The period of study was from September 2000 to April 2001.

Purposive sampling under criteria for eligibility, there were 54 selected samples, which were divided into 2 groups. The experimental group consisted of the mother of premature infants and their infants, who received supportive-educative nursing system and usual nursing care. The control group received only usual nursing care.

Research instruments included 1) the supportive-educative nursing system plan, 2) the handbook of caregiving of premature infant. The collected data instruments include; 1) personal data form 2) growth and development assessment forms 3) the mother's Dependent-care Agency questionnaire form: which adapted from Manee Kuprasit (B.E. 2539) 4) the infant temperament Questionnaire: which adapted from Phumonskul (2000).

Research steps were composed of the selection of samples under the setting criteria. The researcher sought cooperation in the research and under the human rights. The two groups answered personal data forms. The control group received usual nursing care. The experimental received supportive-educative nursing system and usual nursing care. Both groups were recorded in growth and assessed in development by the researcher. They were answered the mother's dependent-care

agency questionnaire form and the infant temperament questionnaire by the assistant researcher at the day of follow-up 14 weeks after discharge. The analysis data by the SPSS/FW.

Result

1. The experimental group had higher dependent-care agency of the mother scores than the control group at 14 weeks after discharge with statistically significant ($p < .01$).
2. The experimental group had higher growth, development and infant temperament scores than the control group at 14 weeks after discharge with statistically significant ($p < .01$, $p < .05$ and $p < .01$ respectively).

Research limitation

1. In this study, the researcher selected the sample by purposive sampling technique, also the results of this study are not generalization to the other groups of mothers and their premature infants.
2. There were some error in this study because the researcher did not measured pre-test of mothers' dependent-care agency in the sample groups.
3. The researcher could not control health information to the sample groups from other health care professionals, and other communications about caring for infants for example radio, television and health books.
4. During the study in the two hospitals, it was impossible to control the same environment.

Suggestions in application of research results

From this study, the result found that supportive-educative nursing system was important in the nursing care for mothers of premature infants. The nurses can giving them holistic care and physiological-psychological support. The research result could improve dependent-care agency of the mothers in caring for their premature infants and could promote growth, development and temperament of the infants. The following recommendations could be considered for application in nursing practice:

1. In this study found that, the questions that the mothers were concerned about daily care, feeding, holding, proper growth, developmental stimulation and health problems. Therefore, the supportive-educative nursing system plan were steps followed first creating relationships and at the same time evaluating demand, problems and setting goals together; second giving information according to the individual's requirement; third guiding and supporting, and the last managing the environment. The researcher had arranged these with the mother individually, could increase their self-confidence, improve their knowledge, skills and develop mothers' dependent-care agency. They could act to care for their infants in order to achieve their objectives in responding to the therapeutic self-care demand of their infants and to encourage in maximum potential of their infants.

2. In this study, the result of the mothers' dependent-care agency questionnaire when classified on each item found that the mothers of premature infants wanted to be consulted about health information from health professionals. It stated that nurses had a proper role in counseling and in developing dependent-care agency of the mother of premature infants. This nursing plan should be a guideline for part of the nursing care plan and adapted to each infant's need for proper care, and be developed as part of discharge planning, and followed up continuously at their home by referral to a community nurse or other health professional.

3. The continuity of follow up was necessary for premature infants because of assessing growth, development and other health problems at the appropriate time was important. Nurses could provide this nursing plan as a guideline for assessing growth, screening development, anticipatory guidance and developmental stimulation. These could prevent many health problems of premature infants.

4. The research results aim to be guideline for management and to be adapted to the supportive-educative nursing system as a way to plan proper nursing intervention for each mother and her premature infant or other high risk infants.

5. In this study showed that telephone counseling could make mothers' confidence to caring for their premature infants. The hospital services should have telephone counseling which this was another way to developed mothers' dependent-care agency to care for their infants.

Suggestions for further study.

1. To study the effects of supportive-educative nursing system on mothers' dependent-care agency, growth, development and temperament in long term for instance 6 and 12 months.
2. To study the effects of other nursing plan by using supportive-educative nursing system as a guideline to develop mothers' dependent-care agency, growth, development and temperament in other high risk groups for instance bronchopulmonary dysplasia or congenital heart disease.
3. To study the effects of supportive-educative nursing system to develop dependent care agency of the mothers of premature infants from the time they are delivered until discharge and continuity of follow-up, which is managed by the case management system.
4. To study the effects of supportive-educative nursing system on fathers' dependent-care agency or the other caregivers.

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มหาบัณฑิต. สาขาสาธารณสุขศาสตร์ บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.
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LIST OF EXPERTS

List of experts for instrument Validity and the handbook of caregiving of premature infant.

1. Doctor Viboon Titaporn (M.D.)
Senior officer of neonatal medical department, Queen Sirikit National Institute of Child Health.
2. Associate Prof. Kannikar Vichitsukon.
Faculty of Nursing, Mahidol University.
3. Assistant Prof. Kruawan Tinsulananda
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4. Miss. Aroonwan Pongsuwan
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5. Miss. Vimonvan Varolarn
Nursing Department, Faculty of Medicine, Ramathibodi Hospital, Mahidol University.

CONSENT FORM

(คำชี้แจงสำหรับกลุ่มควบคุม)

คำชี้แจง

เนื่องด้วยดิฉัน รตอ. หญิง เนาวนิจ พึ่งจันทร์เดช นักศึกษาปริญญาโท สาขาการพยาบาลเด็ก ภาควิชาพยาบาลศาสตร์ คณะแพทยศาสตร์โรงพยาบาลรามาธิบดี มหาวิทยาลัยมหิดล มีความประสงค์ที่จะทำการวิจัย “ผลของการพยาบาลระบบสนับสนุนและให้ความรู้ต่อความสามารถของมารดาในการดูแลทารก การเจริญเติบโต พัฒนาการ และพื้นฐานทางอารมณ์ของทารกเกิดก่อนกำหนด” เพื่อนำผลการวิจัยไปใช้เป็นแนวทางในการช่วยเหลือมารดาทารกเกิดก่อนกำหนด

ดังนั้นจึงใคร่ขอความร่วมมือจากท่านในการเข้าร่วมในการวิจัย โดยมีขั้นตอนคือ ก่อนจำหน่ายกลับบ้านตอบแบบสอบถามข้อมูลทั่วไปของมารดาและทารก และเมื่อมารดาพาทารกมาตรวจสุขภาพ (อาทิตย์ที่ 14 หลังจากจำหน่ายกลับบ้าน) ผู้วิจัยบันทึกการเจริญเติบโต ประเมิน พัฒนาการ และข้อมูลเกี่ยวกับอาการผิดปกติของทารกที่เกิดขึ้นรวมทั้งตอบแบบสอบถามจำนวน 2 ชุด ตามความรู้สึกที่แท้จริง ซึ่งข้อมูลที่ได้จากแบบสอบถามไม่มีถูกหรือผิด นำเสนอในลักษณะเป็นส่วนรวมไม่นำเสนอเป็นรายบุคคล และท่านมีสิทธิที่จะปฏิเสธการเข้าร่วมการวิจัยครั้งนี้ โดยไม่มีผลใดๆ ต่อการรักษาบุตรของท่านแต่อย่างใด ดิฉันขอขอบคุณในความร่วมมือจากท่านมา ณ ที่นี้เป็นอย่างสูง

ขอแสดงความนับถือ

รตอ.(หญิง) เนาวนิจ พึ่งจันทร์เดช

ข้าพเจ้ายินดีให้ความร่วมมือในการวิจัย

ลงชื่อ

(คำชี้แจงสำหรับกลุ่มทดลอง)

คำชี้แจง

เนื่องด้วยดิฉัน รตอ. หญิง เนาวนิจ พึ่งจันทร์เดช นักศึกษาปริญญาโท สาขาการพยาบาล
เด็ก ภาควิชาพยาบาลศาสตร์ คณะแพทยศาสตร์โรงพยาบาลรามาธิบดี มหาวิทยาลัยมหิดล มีความ
ประสงค์ที่จะทำการวิจัย “ผลของการพยาบาลระบบสนับสนุนและให้ความรู้ต่อความสามารถของ
มารดาในการดูแลทารก การเจริญเติบโต พัฒนาการ และพื้นฐานทางอารมณ์ของทารกเกิดก่อน
กำหนด” โดยการให้ความรู้และฝึกทักษะของมารดาเพื่อให้อาจมีความสามารถและมีความมั่นใจในการ
ดูแลทารก หลังจากทารกจำหน่ายกลับบ้าน

ขั้นตอนในการดำเนินการวิจัย ประกอบด้วย

1. มารดาผู้เข้าร่วมการวิจัยได้รับการเตรียมความรู้และฝึกทักษะในการดูแลทารกใน
ระยะเวลา 3 วัน ก่อนทารกจำหน่ายกลับบ้าน โดยแต่ละวันใช้เวลาประมาณ 1 ชั่วโมง
2. ก่อนทารกจำหน่ายกลับบ้าน ผู้วิจัยให้หนังสือคู่มือการดูแลทารกเกิดก่อนกำหนด
และนัดหมายกับมารดาในการโทรศัพท์และการมาตรวจสุขภาพของทารกครั้งแรก 2 อาทิตย์หลัง
จำหน่ายกลับบ้าน
3. เมื่อมารดาพาทารกมาตรวจสุขภาพครั้งแรก ผู้วิจัยบันทึกข้อมูลการเจริญเติบโต และ
ประเมินปัญหาของมารดา ให้คำแนะนำล่วงหน้า และนัดหมายในการตรวจสุขภาพครั้งต่อไป คือใน
อาทิตย์ที่ 6 และอาทิตย์ที่ 14 หลังจำหน่ายกลับบ้าน
4. ดำเนินการเช่นเดียวกับครั้งแรกแต่ในอาทิตย์ที่ 14 ทารกได้รับการบันทึกข้อมูล
เจริญเติบโต และประเมินระดับพัฒนาการรวมทั้งมารดาตอบแบบสอบถาม จำนวน 2 ชุด ตามความ
รู้สึกที่แท้จริง ซึ่งข้อมูลที่ได้จากแบบสอบถามไม่มีถูกหรือผิด นำเสนอในลักษณะเป็นส่วนรวม ไม่
นำเสนอเป็นรายบุคคล และท่านมีสิทธิที่จะปฏิเสธการเข้าร่วมการวิจัยครั้งนี้ โดยไม่มีผลใดๆ ต่อ
การรักษาบุตรของท่านแต่อย่างใด ดิฉันขอขอบคุณในความร่วมมือจากท่านมา ณ ที่นี้เป็นอย่างสูง

ขอแสดงความนับถือ

รตอ.(หญิง) เนาวนิจ พึ่งจันทร์เดช

ข้าพเจ้ายินดีให้ความร่วมมือในการวิจัย

ลงชื่อ.....

INSTRUMENTS

1. แบบแผนการพยาบาลระบบสนับสนุนและให้ความรู้
2. เครื่องมือที่ใช้ในการเก็บรวบรวมข้อมูล
 - แบบบันทึกข้อมูลทั่วไปของมารดาและทารก
 - แบบบันทึกข้อมูลการเจริญเติบโตและการพัฒนาการของทารก
 - แบบวัดความสามารถในการดูแลทารกเกิดก่อนกำหนดของมารดา
 - แบบวัดลักษณะพื้นฐานของอารมณ์ของทารก
3. คู่มือการดูแลทารกเกิดก่อนกำหนด

แบบแผนการพยาบาลระบบสนับสนุนและให้ความรู้

วัตถุประสงค์ทั่วไป

เพื่อพัฒนาความสามารถของมารดาทารกเกิดก่อนกำหนด ก่อนจำหน่ายกลับบ้านให้มีทักษะและความสามารถในการดูแลทารกได้อย่างเหมาะสมและมั่นใจ เพื่อให้ทารกมีการเจริญเติบโต พัฒนาการและพื้นฐานทางอารมณ์ที่เหมาะสม

ขั้นตอนการดำเนินการ

1. ขั้นเตรียมการ

ก่อนทารกจำหน่ายกลับบ้าน 4 วัน

1.1) ผู้วิจัยสำรวจรายชื่อทารกเกิดก่อนกำหนดที่จะได้รับการจำหน่ายกลับบ้าน

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2. ขั้นปฏิบัติ

2.1) ก่อนทารกจำหน่ายกลับบ้าน 3 วัน

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สถานที่ หน่วยบำบัดพิเศษทารกแรกเกิดก่อนกำหนด สถาบันสุขภาพเด็ก

แห่งชาติดมหาราชนิ และวิทยาลัยแพทยศาสตร์ กรุงเทพมหานคร

และเวชพยาบาล

2.2) 2 อาทิตย์ และ 6 อาทิตย์หลังทารกจำหน่ายกลับบ้าน

3. ขั้นสรุป

3.1 14 อาทิตย์หลังทารกจำหน่ายกลับบ้าน

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ขั้นตอน	วัตถุประสงค์	กิจกรรม	เวลา	การประเมิน
ขั้นเตรียมการ (4 วันก่อน จำหน่ายกลับบ้าน)	- เพื่อสร้างสัมพันธภาพ กับมารดา - เพื่อขอความร่วมมือใน การเข้าร่วมการวิจัย	1. ผู้วิจัยสำรวจรายชื่อ ทารกเกิดก่อน กำหนดที่จะได้รับ การจำหน่ายกลับบ้าน บ้าน	20 นาที่	จากความสนใจ ของมารดา
ขั้นปฏิบัติ (3 วันก่อน จำหน่ายกลับบ้าน วันที่ 1)	เพื่อประเมินความสามารถ และความต้องการของมารดา ลดความวิตกกังวลของ มารดาและกำหนดเป้าหมาย ร่วมกันระหว่างผู้วิจัยและ มารดา	1. ผู้วิจัยเปิดโอกาสให้ มารดาแสดง ความรู้สึก ระบาย ความวิตกกังวล และ พุดคุยซักถามข้อ สงสัย - -	15 นาที่ 45 นาที่	จากคำบอกเล่า และปฏิบัติการทำ ทางของมารดา
ขั้นสรุป 14 อาทิตย์ หลัง จำหน่ายกลับบ้าน	เพื่อบันทึกข้อมูลต่างๆ ให้ ครบถ้วนและนำข้อมูลไป ดำเนินการวิเคราะห์ทางสถิติ ต่อไป	1. ผู้วิจัยประเมินและ บันทึกการเจริญเติบโตและระดับ พัฒนาการของ ทารก รวมทั้งข้อมูล ต่างๆ ให้ครบถ้วน สมบูรณ์ - - 5. ผู้วิจัยกล่าวสรุป	30 นาที่	จากการซักถาม ปัญหา และความสนใจ ของมารดา

แบบแผนการสอนก่อนจำหน่ายกลับบ้าน

กลุ่มตัวอย่างเลขที่.....

จำหน่ายกลับบ้านวันที่

หัวข้อ	วันที่ได้รับการสอน	หมายเหตุ
1. มารดาได้รับการสอนและฝึกทักษะเกี่ยวกับการดูแลทารกประจำวัน		
1.1 การอาบน้ำ		
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-		
2. มารดาได้รับการสอนและฝึกทักษะเกี่ยวกับการให้นมมารดา		
2.1 ประโยชน์และวิธีการ การให้นมมารดา		
-		
-		
-		
-		
11. มารดาได้รับการสอนเรื่องวิธีการป้องกันอุบัติเหตุ		
12. มารดาทราบถึงบุคคลหรือแหล่งที่สามารถให้ข้อมูลที่เป็นประโยชน์แก่มารดา		

แบบแผนการสอนหลังจากการจำหน่ายกลับบ้าน 2 อาทิตย์

กลุ่มตัวอย่างเลขที่..... วันที่..... อายุจริงของทารก..... น้ำหนัก.....กรัม ความยาวลำตัว.....ซม. เส้นรอบศีรษะ..... ซม. ปริมาณนมที่ได้รับต่อวัน..... ออนซ์ วัคซีนที่ได้รับ.....
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หัวข้อการสอน	หมายเหตุ
1. ปัญหาที่พบของมารดาได้แก่เรื่อง 1.1) 1.2) 1.3) 1.4) 1.5) 2. การให้คำแนะนำแก่มารดาในเรื่อง 2.1 พฤติกรรมการร้องไห้ “Colic” และการดูแลทารกขณะเกิดอาการ “Colic” 2.2 2.6 วันนัดและวัคซีนที่จะได้รับครั้งต่อไป	

แบบแผนการสอนหลังจากการจำหน่ายกลับบ้าน 6 อาทิตย์

กลุ่มตัวอย่างเลขที่..... วันที่..... อายุจริงของทารก..... น้ำหนัก.....กรัม ความยาวลำตัว..... ซม. เส้นรอบศีรษะ..... ซม. ปริมาณนมที่ได้รับต่อวัน..... ออนซ์ วัคซีนที่ได้รับ.....

หัวข้อการสอน	หมายเหตุ
1. ปัญหาที่พบของมารดา ได้แก่เรื่อง 1.1) ... 1.2) ... 1.3) ... 1.4) ... 1.5) ... 2. การให้คำแนะนำแก่มารดาในเรื่อง 2.1 พัฒนาการที่เหมาะสมตามวัยและการส่งเสริมพัฒนาการที่เหมาะสม - - 2.4 วันนัดและวัคซีนที่จะได้รับครั้งต่อไป	

แบบแผนการสอนหลังจากทารกจำหน่ายกลับบ้าน 14 อาทิตย์

กลุ่มตัวอย่างเลขที่
วันที่..... อายุจริงของทารก.....
น้ำหนัก.....กรัม ความยาวลำตัว..... ซม. เส้นรอบศีรษะ..... ซม.

หัวข้อการสอน	หมายเหตุ
1. ปัญหาที่พบของมารดา ได้แก่เรื่อง 1.1) ... 1.2) ... 1.3) ... 1.4) ... 1.5) ... 2. การให้คำแนะนำแก่มารดาในเรื่อง 2.1 การเริ่มอาหารเสริมเมื่อทารกอายุ 4 เดือน - - 2.6 วันนัดและวัคซีนที่จะได้รับครั้งต่อไป	

แบบบันทึกข้อมูลทั่วไปของมารดาและทารก

คำชี้แจง ให้ขีดเครื่องหมาย ✓ ลงในวงเล็บ () หรือเติมคำลงในช่องว่าง

ส่วนที่ 1 ข้อมูลทั่วไปของมารดา

1. อายุ ปี นับถือศาสนา.....
2. สถานภาพสมรส
() คู่ () หม้าย () หย่าหรือแยกกันอยู่
3. ระดับการศึกษาสูงสุด
() ประถมศึกษา () มัธยมศึกษา
() อนุปริญญา () ปริญญาตรี
() อื่นๆ ระบุ
4. อาชีพ
() รับราชการ, รัฐวิสาหกิจ () ค้าขาย
() เกษตรกรรม () รับจ้างเอกชน
() แม่บ้าน
() อื่นๆ ระบุ
5. รายได้ครอบครัวเฉลี่ยต่อเดือน.....บาท
6. จำนวนสมาชิกในครอบครัว คนได้แก่
-
- สมาชิกในครอบครัวที่จะช่วยดูแลทารกได้แก่
7. จำนวนบุตรที่มีมาก่อน คน
8. โรคแทรกซ้อนระหว่างการตั้งครรภ์
9. โรคประจำตัวของมารดาได้แก่
10. วิธีการคลอด
() คลอดปกติ () ผ่าท้องคลอด
() อื่นๆ ระบุ

ส่วนที่ 2 ข้อมูลทั่วไปของทารก

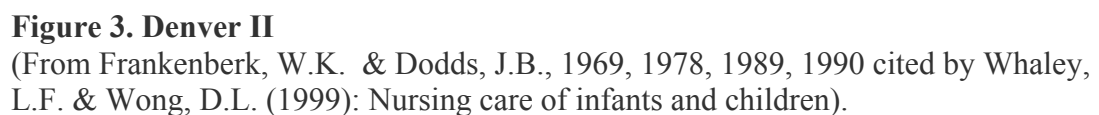
1. เพศ () ชาย () หญิง
2. ทารกเป็นบุตรคนที่
3. อายุครรภ์..... สัปดาห์ คลอดวันที่
4. น้ำหนักแรกเกิด..... กรัม
ความยาวลำตัว เซนติเมตร
เส้นรอบศีรษะ เซนติเมตร
5. คะแนน Apgar Score
6. จำนวนวันที่ทารกเข้ารับการรักษานในโรงพยาบาล วัน
7. ภาวะแทรกซ้อนหลังคลอด
8. อายุขณะจำหน่าย สัปดาห์ อายุที่ปรับแล้ว (อายุจริง) สัปดาห์
9. น้ำหนักขณะจำหน่าย กรัม
ความยาวลำตัว เซนติเมตร
เส้นรอบศีรษะ เซนติเมตร
10. อาการทั่วไปขณะจำหน่าย.....

แบบบันทึกข้อมูลการเจริญเติบโตและพัฒนาการของทารก

กลุ่มตัวอย่างเลขที่ ชื่อ นามสกุล.....

การเจริญเติบโต	ว.ค.ป	ว.ค.ป.	ว.ค.ป.
	อายุ	อายุ	อายุ
น้ำหนัก (กรัม)			
ส่วนสูง (ซม.)			
รอบศีรษะ (ซม.)			

การเจริญเติบโต	อายุ	
	ปกติ	สงสัยล่าช้า
1. กล้ามเนื้อมัดใหญ่		
-		
-		
-		
2. ภาษา		
-		
-		
-		
3. กล้ามเนื้อเล็กและการปรับตัว		
-		
-		
-		
4. สังคมและการช่วยเหลือตัวเอง		
-		
-		
-		



DIRECTIONS FOR ADMINISTRATION

1. Try to get child to smile by smiling, talking or waving. Do not touch him/her.
2. Child must stare at hand several seconds.
3. Parent may help guide toothbrush and put toothpaste on brush.
4. Child does not have to be able to tie shoes or button/zip in the back.
5. Move yarn slowly in an arc from one side to the other, about 8" above child's face.
6. Pass if child grasps rattle when it is touched to the backs or tips of fingers.
7. Pass if child tries to see where yarn went. Yarn should be dropped quickly from sight from tester's hand without arm movement.
8. Child must transfer cube from hand to hand without help of body, mouth, or table.
9. Pass if child picks up raisin with any part of thumb and finger.
10. Line can vary only 30 degrees or less from tester's line.
11. Make a fist with thumb pointing upward and wiggle only the thumb. Pass if child imitates and does not move any fingers other than the thumb.



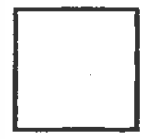
12. Pass any enclosed form. Fail continuous round motions.



13. Which line is longer?
(Not bigger.) Turn paper upside down and repeat.
(pass 3 of 3 or 5 of 6)



14. Pass any lines crossing near midpoint.

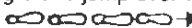


15. Have child copy first.
If failed, demonstrate.

When giving items 12, 14, and 15, do not name the forms. Do not demonstrate 12 and 14.

16. When scoring, each pair (2 arms, 2 legs, etc.) counts as one part.
17. Place one cube in cup and shake gently near child's ear, but out of sight. Repeat for other ear.
18. Point to picture and have child name it. (No credit is given for sounds only.)
If less than 4 pictures are named correctly, have child point to picture as each is named by tester.



19. Using doll, tell child: Show me the nose, eyes, ears, mouth, hands, feet, tummy, hair. Pass 6 of 8.
20. Using pictures, ask child: Which one flies?... says meow?... talks?... barks?... gallops? Pass 2 of 5, 4 of 5.
21. Ask child: What do you do when you are cold?... tired?... hungry? Pass 2 of 3, 3 of 3.
22. Ask child: What do you do with a cup? What is a chair used for? What is a pencil used for?
Action words must be included in answers.
23. Pass if child correctly places and says how many blocks are on paper. (1, 5).
24. Tell child: Put block on table; under table; in front of me, behind me. Pass 4 of 4.
(Do not help child by pointing, moving head or eyes.)
25. Ask child: What is a ball?... lake?... desk?... house?... curtain?... fence?... ceiling? Pass if defined in terms of use, shape, what it is made of, or general category (such as banana is fruit, not just yellow). Pass 5 of 8, 7 of 8.
26. Ask child: If a horse is big, a mouse is ___? If fire is hot, ice is ___? If the sun shines during the day, the moon shines during the ___? Pass 2 of 3.
27. Child may use wall or rail only, not person. May not crawl.
28. Child must throw ball overhand 3 feet to within arm's reach of tester.
29. Child must perform standing broad jump over width of test sheet (8 1/2 inches).
30. Tell child to walk forward,  heel within 1 inch of toe. Tester may demonstrate.
Child must walk 4 consecutive steps.
31. In the second year, half of normal children are non-compliant.

OBSERVATIONS:

Figure 4 Directions for Administration of Denver II

แบบวัดความสามารถในการดูแลทารกเกิดก่อนกำหนดของมารดา

คำชี้แจงในการตอบแบบประเมิน

ข้อความต่อไปนี้ เป็นข้อความที่บรรยายถึงลักษณะของมารดาในการดูแลทารกเกิดก่อนกำหนด กรุณาให้ความเห็นในแต่ละข้อว่าตรงกับลักษณะของตัวท่านมากน้อยเพียงใด ขอให้ท่านตอบตรงกับความรู้สึกที่แท้จริงของท่านให้มากที่สุด คำตอบของท่านไม่มีถูกหรือผิด และไม่มีผลกระทบต่อการรักษาพยาบาลบุตรของท่าน

ขอให้ทำเครื่องหมาย ✓ ลงในช่องที่ท่านคิดว่าตรงกับตัวท่านมากที่สุด

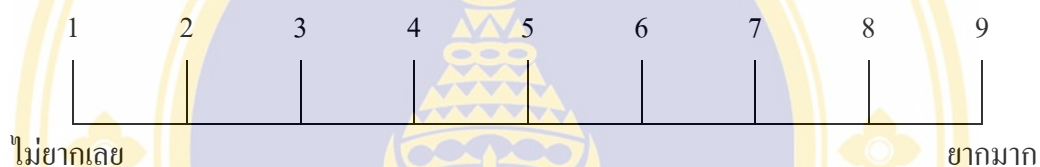
ข้อความ	ไม่ตรงกับ ตัวท่านเลย	ตรงกับ ตัวท่าน เล็กน้อย	ตรงกับ ตัวท่าน ปานกลาง	ตรงกับ ตัวท่าน พอสมควร	ตรงกับตัว ท่านมาก ที่สุด
1. ฉันดูแลรักษาความสะอาดของสภาพแวดล้อมรอบตัวฉันและลูกอย่างสม่ำเสมอ					
2. ฉันรักษานามัยส่วนตัวของลูกโดยดูแลทำความสะอาดร่างกายและอาบน้ำให้ลูกตามความเหมาะสม					
-					
-					
-					
26. ฉันจะปรับกิจกรรมให้เหมาะสมเมื่อลูกของฉันอ่อนเพลียหรือไม่สบาย					

แบบวัดลักษณะพื้นฐานทางอารมณ์ของทารก

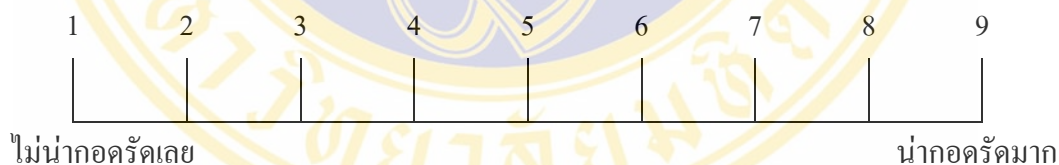
คำชี้แจง

แบบวัดนี้ใช้สอบถามเกี่ยวกับคุณลักษณะของบุตรท่าน รวมทั้งวิธีการที่บุตรท่านใช้ตอบสนอง หรือมีปฏิสัมพันธ์กับสิ่งต่างๆ เหตุการณ์ต่างๆ และตัวท่านเอง โดยวงกลมรอบตัวเลขที่ตรงกับความรู้สึกของท่านมากที่สุดเพียงคำตอบเดียว

1. การปลอบโยนให้บุตรท่านเจ็บสงบ ทำได้ยากเพียงใด



2. บุตรของท่านน่าอึดอัดมากเพียงใด

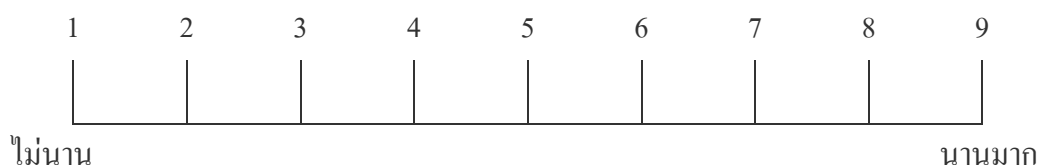


3. ...

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19. เมื่อบุตรของท่านมองดูสิ่งใดสิ่งหนึ่ง เขาจะมองเป็นเวลานานๆ หรือมองเพียงชั่วครา

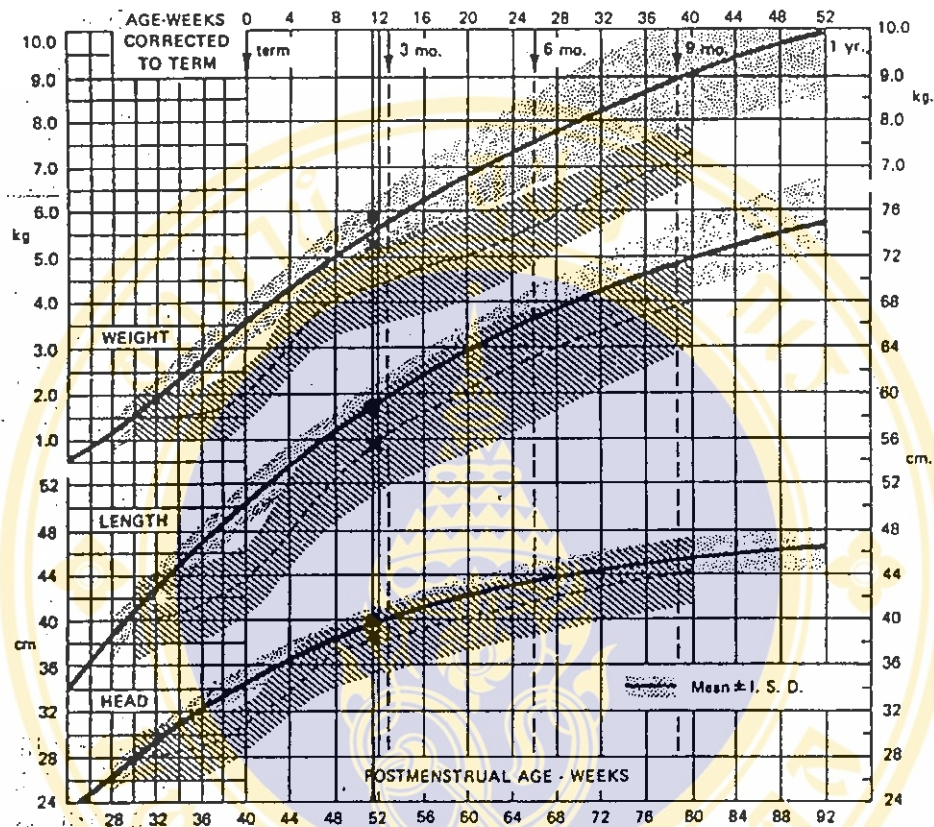


คู่มือการดูแลทารกเกิดก่อนกำหนด

1. รูปร่างลักษณะทั่วไปของทารกเกิดก่อนกำหนด
2. การดูแลทารกเกิดก่อนกำหนดประจำวัน
 - การอาบน้ำสระผม
 - การเลือกเสื้อผ้าที่เหมาะสม
 - การเปลี่ยนผ้าอ้อม
 -
 -
3. การให้อาหารทารก
 -
 -
 -
11. วิธีการให้ยา
12. การจัดสภาพแวดล้อมในบ้านให้เหมาะสม และการป้องกันอุบัติเหตุ

Table 10 Mean and standard deviation of dependent-care agency scores in each item of the sample groups.

ข้อความ	Experimental group (n = 26)		Control group (n = 28)	
	Mean	SD.	Mean	SD.
1. ฉันดูแลรักษาความสะอาด	4.81	0.40	4.04	0.64
2. ฉันเลือกทำในสิ่งที่ทำให้ลูกฉัน	4.77	0.43	4.50	0.58
3. ฉันไม่ค่อยมีกำลังวังชาเพียงพอ	4.65	0.56	3.57	1.17
4. ฉันพยายามหาวิธีที่ดีกว่าเดิม	4.54	0.71	4.07	0.72
5. ฉันรักษานามยี่ส่วนตัวของลูก	4.88	0.33	4.61	0.50
6. ฉันให้นมลูกรับประทานอย่างเพียงพอ	4.92	0.27	4.61	0.57
7. ฉันพยายามที่จะดูแลลูกด้วยตัวเอง	4.73	0.53	4.14	0.85
8. ฉันไม่ค่อยมีเวลาว่างที่จะเล่น	4.69	0.79	3.57	1.17
9. ในชีวิตที่ผ่านมาฉันได้ผูกมิตรกับเพื่อน	4.00	0.85	3.54	1.07
10. ฉันไม่ได้ดูแลให้ลูกได้นอนหลับ	4.69	0.68	4.11	1.47
11. ฉันไม่ได้ซักถามแพทย์หรือพยาบาล	4.35	0.80	3.36	1.16
12. ฉันไม่ได้ตรวจดูแลความเปลี่ยนแปลง	4.58	0.95	3.86	1.21
13. เมื่อแพทย์ให้ยาใหม่แก่ลูก ฉันต้องถาม	4.19	0.80	3.68	1.06
14. เเท่าที่ผ่านมาฉันได้เปลี่ยนแปลงนิสัย	4.46	0.65	4.14	0.59
15. ฉันดูแลความปลอดภัยแก่ลูก	4.92	0.27	4.93	0.26
16. ฉันได้ประเมินในสิ่งที่ฉันปฏิบัติต่อลูก	4.65	0.49	4.46	0.58
17. ในแต่ละวันฉันไม่ค่อยมีเวลา	4.62	0.75	3.82	1.09
18. ฉันสามารถแสวงหาความรู้	4.23	0.71	3.86	0.89
19. ฉันขอความช่วยเหลือคนอื่น	4.15	0.73	3.36	1.03
20. ฉันมักจะมีปัญหาเกี่ยวกับสุขภาพ	4.81	0.63	4.25	1.14
21. ฉันดูแลให้ลูกได้รับวัคซีน	4.92	0.27	4.93	0.26
22. ฉันคอยกระตุ้นให้ลูกมีพัฒนาการ	4.69	0.55	4.18	0.82
23. ฉันคอยประเมินน้ำหนักอยู่เสมอ	4.69	0.62	4.29	0.81
24. เนื่องจากฉันเป็นแม่ของลูก	4.69	0.68	4.36	0.68
25. ฉันไม่ค่อยได้กอดทักทาย	4.12	0.95	3.57	1.14
26. ฉันจะปรับกิจกรรมให้เหมาะสม	4.27	0.96	4.29	0.66

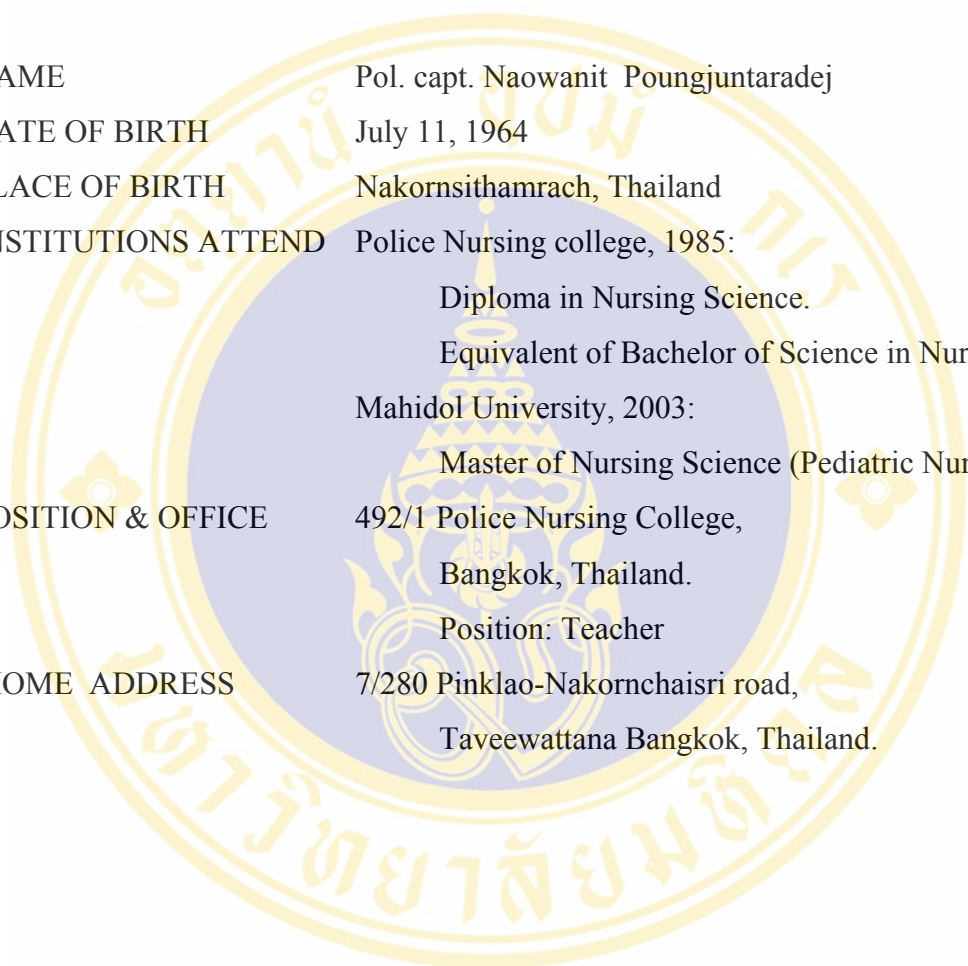


X Control group

• Experimental group

Figure 5 Mean of growth of sample groups.

(Growth of sick preterm infants (diagonal shade) compared with Babson's curve for postnatal growth in well infants, Form Babson, S.G., 1970 cited by Manser, : Clinic in Perinatology 11:23; 1984.

BIOGRAPHY

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