

**EFFECTS OF SUPPORTIVE-EDUCATIVE NURSING SYSTEM
ON MATERNAL CAREGIVING BEHAVIORS AND HEALTH
OUTCOME OF PREMATURE INFANTS**



**A THESIS SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR
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Thesis
entitled

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OUTCOME OF PREMATURE INFANTS**

The seal of Mahidol University is a large, circular emblem in the background. It features a central blue circle with a white stupa-like structure inside. The outer ring of the seal contains the university's name in Thai script: "จุฬาลงกรณ์มหาวิทยาลัย" (Mahidol University).

Nethong T.

Miss. Nethong Taya
Candidate

Jariya Wittayasoporn

Asst. Prof. Jariya Wittayasoporn,
D.N.S
Major - Advisor

Yuwadee Luecha

Assoc. Prof. Yuwadee Luecha,
Ed.D.
Co - Advisor

Rassmidara Hoonsawat

Assoc. Prof. Rassmidara Hoonsawat,
Ph.D.
Dean
Faculty of Graduate Studies

Yuwadee Luecha

Assoc. Prof. Yuwadee Luecha,
Ed.D.
Chair
Master of Nursing Science
Faculty of Medicine
Ramathibodi Hospital

Thesis
entitled

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ON MATERNAL CAREGIVING BEHAVIORS AND HEALTH
OUTCOME OF PREMATURE INFANT AFTER DISCHARGE**

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For the degree of Master of Nursing Science (Pediatric Nursing)

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Miss. Nethong Taya
Candidate



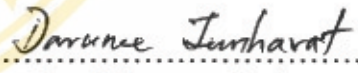
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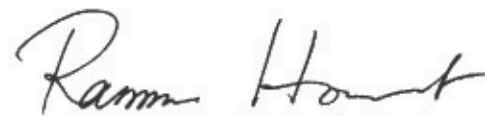
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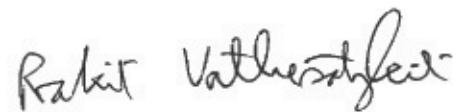
Prof. Veena Jirapaet,
D.N.Sc.
Member



Assoc. Prof. Darunee Junhvat,
M.Ed.
Member



Assoc. Prof. Rassmidara Hoonsawat,
Ph.D
Dean
Faculty of Graduate Studies
Mahidol University



Prof. Prakit Vathesatogkit,
M.D., ABIM, FRCP.
Dean
Faculty of Medicine
Ramathibodi Hospital
Mahidol University

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EFFECTS OF SUPPORTIVE-EDUCATIVE NURSING SYSTEM ON MATERNAL CAREGIVING BEHAVIORS AND HEALTH OUTCOME OF PREMATURE INFANTS

NETHONG TAYA 4436603 RAPN / M

M.N.S. (PEDIATRIC NURSING)

THESIS ADVISORS : JARIYA WITTAYASOOPORN, D.N.S. (NURSING),
YUVADEE LUECHA, Ed.D. (EDUCATION)

ABSTRACT

The purpose of this quasi-experimental research was to determine the effects of a supportive-educative nursing system on maternal care-giving behavior and health outcome of premature infants after discharge. Orem's self-care theory was used as the conceptual framework for this study. The participants were premature infants and their mothers from the neonatal care unit at Maharaj Nakorn Chiang Mai Hospital. The study was conducted from February 2003 to October 2003. Forty mothers and their infants were divided into a control and an experimental group using purposive sampling. The control group received the usual nursing care in the neonatal care units while the experimental group received the supportive-educative nursing system provided by the researcher in addition to the usual nursing care. The evaluation of maternal care-giving behavior and the health outcome of premature infants were collected using questionnaire of premature infant's and mother's demographic data, the maternal care-giving behavior questionnaire, the record form of illness in the premature infants after hospital discharge, and the record form of weight, height, and head circumference measurement at one month after hospital discharge all of which instruments were modified by the researcher. All data were collected and analyzed using SPSS/FW program.

The result showed that the mean score for maternal care-giving behavior one month after hospital discharge in the experimental group was significantly higher than in the control group ($p < .001$). The health outcome of premature infants one month after discharge in the experimental group was significantly better than in the control group.

Results of the research suggest that the supportive-educative nursing system for promoting maternal care-giving behavior and health outcome of premature infants is effective. Furthermore, the program could be applied in clinical practice for newborn infants to improve maternal care-giving behavior and the health outcome of the infants.

KEY WORDS : SUPPORTIVE – EDUCATIVE NURSING SYSTEM /
MATERNAL CAREGIVING BEHAVIORS/ HEALTH
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ผลของการพยาบาลระบบการสนับสนุนและให้ความรู้แก่มารดาทารกคลอดก่อนกำหนดต่อพฤติกรรม
การดูแลของมารดาและผลลัพธ์สุขภาพทารก (EFFECTS OF SUPPORTIVE-EDUCATIVE
NURSING SYSTEM ON MATERNAL CAREGIVING BEHAVIORS AND
HEALTH OUTCOME OF PREMATURE INFANTS)

เนตรทอง ทะยา 4436603 RAPN/M

พย.ม. (การพยาบาลเด็ก)

คณะกรรมการควบคุมวิทยานิพนธ์: จริยา วิทยะสุกร, D.N.S.(การพยาบาลเด็ก), ยุวดี ภาษา , Ed.D.
(การศึกษา)

บทคัดย่อ

การวิจัยกึ่งทดลองครั้งนี้ มีวัตถุประสงค์เพื่อศึกษาผลของการพยาบาลระบบการสนับสนุนและให้ความรู้แก่มารดาทารกคลอดก่อนกำหนดต่อพฤติกรรมดูแลของมารดาและผลลัพธ์สุขภาพทารกภายหลังจำหน่ายออกจากโรงพยาบาล โดยใช้ทฤษฎีการพยาบาลของโอเร็มเป็นกรอบแนวคิดในการศึกษากลุ่มตัวอย่างเป็นมารดาที่มีบุตรเป็นทารกคลอดก่อนกำหนดที่เข้ารับการรักษาดูแลในหออภิบาลทารกแรกเกิด โรงพยาบาลมหาราชนครเชียงใหม่ ระหว่างเดือนกุมภาพันธ์ถึงตุลาคม 2546 มีการคัดเลือกกลุ่มตัวอย่างแบบเฉพาะเจาะจงตามคุณสมบัติที่กำหนดไว้ทั้งหมด 40 คน แบ่งเป็นกลุ่มควบคุมและกลุ่มทดลองอย่างละเท่าๆ กัน โดยกลุ่มควบคุมได้รับการพยาบาลตามปกติ ส่วนกลุ่มทดลองได้รับการพยาบาลระบบสนับสนุนและให้ความรู้ร่วมกับการพยาบาลตามปกติ เก็บรวบรวมข้อมูลด้วยแบบสอบถามพฤติกรรมดูแลทารกคลอดก่อนกำหนดของมารดาภายหลังจำหน่ายออกจากโรงพยาบาล แบบบันทึกพฤติกรรมทารกคลอดก่อนกำหนดและประวัติการเจ็บป่วยภายหลังจำหน่ายออกจากโรงพยาบาลและแบบบันทึกน้ำหนัก ความยาวลำตัวและเส้นรอบศีรษะ ทำการเก็บข้อมูลและวิเคราะห์ผลการศึกษาด้วยโปรแกรม SPSS/FW

ผลการวิจัยพบว่า กลุ่มทดลองที่ได้รับการพยาบาลตามปกติร่วมกับการพยาบาลระบบการสนับสนุนและให้ความรู้แก่มารดาทารกคลอดก่อนกำหนดมีคะแนนพฤติกรรมดูแลทารกคลอดก่อนกำหนดสูงกว่ากลุ่มควบคุมอย่างมีนัยสำคัญทางสถิติ ($p < .001$) และมีผลลัพธ์สุขภาพดีกว่า

ดังนั้นผลการศึกษานี้ชี้ว่า การนำการพยาบาลระบบสนับสนุนและให้ความรู้มาใช้ในการส่งเสริมพฤติกรรมดูแลทารกคลอดก่อนกำหนดของมารดา ซึ่งทำให้สุขภาพของทารกคลอดก่อนกำหนดดีขึ้นอันเป็นผลจากประสิทธิภาพการดูแลของมารดา การพยาบาลระบบนี้ยังประยุกต์ใช้เพื่อส่งเสริมพฤติกรรมดูแลทารกที่มีปัญหาอื่นๆเพื่อให้มีสุขภาพที่ดีได้เช่นกัน

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CHAPTER I

INTRODUCTION

Background and rationale

Premature infants are at risk of illness, deformity and death from the shortage of the normal fertilization period, resulting in a still-evolving organism which affects its function. For this reason they have severe complications (Somphong Pongthai, & Vinitch Paupradit, B.E. 2531: 173-182). In spite of increasing survival rate of premature infants due to advanced medical technology, there is a tendency towards deformity of the physical features and the complications which not only directly affects the infants but also their family members, especially the mothers. In Chiang Mai, the statistics show that the crude birth rate of the premature infants who were born in the year 2000, weighing less than 2,500 grams was 10.9 - 11.8 per 100 infants (Office of Public Health, B.E. 2542). The research survey at Maharaj Nakorn Chiang Mai Hospital during 2000-2001 found that 298 premature infants having a survival rate of more than 80 percent. When premature infants are discharged from the hospital, they are at risk of many problems. Due to their underdeveloped central nervous system, premature infants behave differently from full-term infants. Some behavior does not express their needs, and sometimes the meaning is lost. These behaviors include: sleeping and alertness, eating, crying and attachment. The health problems of premature infants are as follows: infection, anemia, colic, nausea, vomiting, retinopathy of premature infant (ROP), and delayed growth and development (Gorski, 1988: 27-32; Kang, et al., 1995:171-180; Blackburn, 1995: 43-49; Jutarat Mesukko, B.E. 2540 :117-136). As a result, the re-hospitalization rate of the premature infants is increased during their first year. In USA, the re-hospitalization rate ranges from 25 - 50 percent (Termini, Brooten, Brown, Gennaro,& York, 1990: 23-26). Infants with 33 to 36 weeks' gestational age were re-hospitalized at a higher rate than regular infants (Escobar, Joffe, Gardner, Armstrong, Carpenter, & Folk, 1999: e2). At Maharaj Nakorn Chiang Mai Hospital,

there is re-hospitalization of premature infant after hospital discharge, but no statistic were kept.

In addition, the care of premature infants post-discharge has been associated with an increase in stress developing event in the mother. After weeks of hospitalization, the mother is expected to take their preterm infant back home and assume total care, but while the infants are in the neonatal care unit, the primary caregiver for the premature infants on neonatal care unit was relieved from the mothers by nursing staffs. The staffs that were in charge of the infants are experts and assume total care for them. At this time of discharge, mothers of the preterm infants reported that they were having low self-esteem, feeling of failure, inability to cope, and changing living patterns such as altering sleep patterns and having less time for others (Mckim, 1993: 89; Gorrie, Mckinney, & Murray, 1998: 614). The mothers also pressed doubt about their incompetence to care for their premature infants and to be able to recognize and manage the problems (Costello, & Chapman, 1997: 37). Parents of premature infants face major time of crisis just prior to discharge from the hospital through the initial period at home. The initial period of discharge of premature infant precipitates another period of crisis as the parents realize that they must now care for their infant alone. These mothers often face the period of transition from the hospital to home with little preparation, experience, or support. The effects of adapting to the period of crisis and lack of confidence in ability to care for their infant leaves them in a state of mal-adaptation and stress that make it difficult to establish and maintain a relationship with their infants (Mckim, 1993: 89-96; Costello, & Chapman, 1998: 37-42; Jutarat Mesukko, B.E. 2540:143-145). The manner in which these crises are handled often determines the long-term outcome for both the child and the family (Brooten, et al., 1988: 213-216; Gennaro, et al., 1992: 39-43; Kenner, & Brueggemeyer, 1993: 1058; Bidder, Crowe, & Gray, 1974 cite in Mckim, 1993: 89; Jutarat Mesukko, B.E. 2540:124; Tilokskulchai, Phatthanasiriwethin, Vichitsukul, and Serisathien; 2002: 70). Therefore, the mothers need more information to help take care of these high-risk infants after hospital discharge. The needs of premature infants' mothers are as follows: information about health status of premature infants, growth and development, behavior patterns and illnesses. For this reason, the mothers of pre-term infants need support from home visit by health care team in the first week after

discharge because they need this support for their self-esteem and self-confidence to take care her infant (Mckim, 1993: 89-96; Mckim & et.al., 1995: 184-193; Jutarat Mesukko, B.E. 2540:79).The preterm infants should be seen for an initial visit within 7-14 days after discharge. This allows the health - care provider to evaluate adaptation to home and parental adjustment; provides an opportunity for parental support and reassurance; and, if the primary health-care provider is not familiar with the infant, allows him or her time to get acquainted (Blackburn,1995: 44). Home visits by nurses to women during their pregnancy and the child's mortality, improves maternal and infant health, and lower healthcare costs (Schiff, 2001: 16) and the re-admission rate for infants who receive a home visit is lower than for infants who do not receive a home visit. Patient satisfaction surveys have been positive (Johnson, Brennan, & Flynn-Tymkow, 1999: 480). Some study revealed that mothers need handbook about the premature infant care (Mckim, 1993: 89-96, Pornpun Keelawong, B.E.2544: 96).Cognitive learning theorists believe that people can recall their memory when they receive the content. The researcher provides premature infant cares' handbook for the mothers to recall their memory about premature infant care (Deacon, 1999: 355; Sa-ard Mungsin, B.E. 2537:86).

According to Orem, self-care comprises of purposeful and deliberated action that is learned by the person and directed towards a goal. An individual's knowledge, motivation, and skill could influence the ability to carry out self-care (Orem, 1995: 225-227). In the case of premature infants, they need dependent-care from their mothers who have dependent care agency. In many researches, it was found that the premature mothers lost their self-confident in baby care and needed much support for help in their ability to care for their infants. In the health care team, most of the nurses are closed to the mothers and are in the best position to offer the mothers of the premature infants a helping hand to reduce their anxieties and develop the dependent-care agency and at the same time to enhance the growth of premature infants. Therefore, it is necessary to organize a nursing system that will help the dependent-care agency of the mother to look after premature infant with sufficient and continuous support. The appropriate nursing system for the mothers is the supportive-educative nursing system. It includes teaching, guiding, supporting and managing environmental conditions. Through this system the mother will learn to allocate

therapeutic self-care demands of the premature infant and take action to look after her infant. She will be instructed by a nurse to sustain her performance in order to achieve her desired objective of the therapeutic self care demands of her own infant (Somjit Hanucharunkul, B.E.2540: 29) by building up a relationship and developing skills in communicating with the mother. It is important that, the nurses make the mothers believe, with trust and understanding, that they are willing to give consistent help and proper care for their infants. This will set up a guideline for performance and reduce the physiological and psychological stresses upon the patients (Prapsak & Jirawathakul, 1988: 88) which will help develop the caregiving behavior of the mothers and thus encourage the well-being of premature infants. Neonatal nurses were seen as the most important sources of information by parents before hospital discharge (Mancini & While, 2001: 59). Mothers who received help with regards to the anticipation and planning for the discharge decrease their feeling of uncertainty about assuming total responsibility for their infants' care (Costello, & Chapman, 1998: 37). Then the mothers have the right caregiving knowledge and skill, so they could lead a healthy life for their babies. Once a high-risk infant is discharged from the hospital, the nurse must help and support the mother by giving anticipatory guidance about infant care at home using the supportive-educative nursing system and the suitable timing.

The researcher has studied and adopted Orem's theory of a supportive-educative nursing system as guideline for the study of the mothers and their premature infants to help them develop their caregiving behavior that is appropriated to the development stages and to create the suitable health outcome for the premature infant after discharge. This nursing system includes the following strategies. Teaching is aimed at developing maternal caregiving behavior by using CAI on the meaning of premature infants for promoting the learning of dependent-care practice. Although, the media of the assisted instruction are as follows: sound, slide, image, video and cinema, etc. have been used in general for teaching, but they are also one-way communication where the participant could not respond. Computer Assisted Instruction (CAI) is perhaps the newest educational strategy available to health teaching. There are many studies in the literature about the utilization of CAI for adult. For instance, the CAI program that is aimed at the effects of Computer Assisted Instruction use to provide

nursing students with knowledge (Sureeruk Achlapong, B.E. 2543; Nongkran Ruangjitt, 1999: 187), developing self-care in adolescent patients (Heran, et.al, 1990 cited in Peterson, 1996: 187), and instruction lesson on introduction to computer training the Government Saving Bank Personnels (Choltira Arayavongwal, B.E. 2541). The result of these studies indicated that CAI program is able to be applied for learners to practice readiness, increase self-care practice, and improve learning achievement. In neonatal care unit of Maharaj Nakorn Chiang Mai Hospital, the neonatal nurse and the pediatric nurse instructors have developed Computer assisted Instruction (CAI) for promoting the learning of premature infant care for the premature infants' mothers. The content of CAI was designed using knowledge about premature infant. Mothers can go over any topic that they don't understand before they practice with their infants. Guiding will encourage the mothers of premature infants to make decisions about premature infant care, providing suggestions to the mothers which will be suitable for practicing, including assessing capabilities through discussing their problems. The support from the nurses will promote and maintain the mothers' effectiveness on the performance of the activities for premature infant care by creating a relationship between nurses, mothers, and enhancing morale with the use of touch, words, and sympathetic expressions. This will make the mothers believe and trust which will augment premature infants care. The researcher provides telephone advising at any time and has home visit at one week after hospital discharge. Managing environmental conditions is a means to promote maternal caregiving behavior by allowing the mothers to share and exchange their experiences, by opening an avenue for closer relationships so that the mothers can express themselves, visit their babies, practice their premature infant care, ask questions, and giving handbook of premature infant care for the mothers. The researcher has believed that a supportive – educative nursing system will be promoting maternal caregiving behaviors and health outcome of premature infants.

Theoretical Framework

This research was carried out by applying Orem's theory of self-care as the guideline for the study of maternal caregiving behavior through the use of a supportive-educative nursing system. It was believed that this system will gain a

positive effect on the maternal caregiving behavior as well as affecting the premature infant's health outcome. The nursing system is the activity performed using the agency to adjust and remedy the balance between maternal caregiving behavior and therapeutic self-care demand of premature infants. The nursing system will be established when the nurse communicates with the mother in order to find out the problems and self-care demand and perform such actions in response to the therapeutic self-care demand of the premature infants. This includes attempting practical usage and developing the mother's ability to respond to the premature infants according to the nursing system and the nursing process. The nursing system is a dynamic process in which there are continual changes depending on the capability and therapeutic self-care demand of the receiver (Somjit Hanucharunkul, B.E. 2540: 27).

Orem (2001:350) has divided this nursing system by types of caring into three systems: (1) the wholly compensatory nursing system; (2) the partly compensatory nursing system; and (3) the supportive-educative nursing system.

The third system is for situations where the patient is able to perform or/and should learn to perform a required measure of externally or internally oriented therapeutic self-care, but cannot do so without any assistance. Suitable helpful techniques in these situations include the combinations of support, guidance, provision of a developmental environment, and teaching. This is a supportive-educative nursing system. It is the only system in which a patient's requirements for help are confined to decision making, behavior control, and acquiring knowledge and skills. There are a number of variations of this system. At first, the premature infant mothers can perform care measures, but they need guidance and support.

Guiding and Supporting. Guiding is encouraging the mothers of premature infant to make decision. The premature infant care provides suggestions for the mother that will be suitable for practice which includes assessing the capabilities through and discussing their problems. Supporting is the encouragement of maintaining the mother's effect on the performance of activities of premature infant care by creating relationships between the nurse and the mothers and by enhancing morale with touching, words, and sympathetic expressions.

This will make the mother believe and trust which will enhance premature infant care. The researcher watched the mothers in the experimental group continually on a daily basis before their babies got discharge from the hospital and one-time follow-up by home visit at one week after hospital discharge. In addition, after hospital discharge the researcher provided telephone advising at all time for the mothers with the help of neonatal care unit nurses and the researcher.

Teaching is required in the second variation. Teaching is an appropriate tool development of knowledge enabling the mothers to assess the situation accurately, supporting the mothers in developing their understanding of events. The researcher conducted teaching activity providing specific knowledge according to the mother's requirements and creating a teaching environment on an individual basis in a friendly atmosphere, which included discussion sessions for exchanging new points and knowledge between the researcher and the mothers about premature infant care at the hospital and home. It also included consideration in finding out the guideline to solve the problems which Orem (1995: 15-19) said that the teaching process according to an individual's requirements will help develop knowledge and practice. Teaching or instructing is the best means to aid the mothers in developing the necessary knowledge and certain skills which is the most important thing in the development of maternal caregiving behaviors on premature infant care. Computer based education is just beginning to emerge as a learning option. One such instructional strategy is computer-assisted instruction (CAI). There is clear evidence that CAI can promote learning and that users are, in general, satisfied with the use of CAI. CAI could deliver a high-quality instruction with clear instructional objectives, information sequences, appropriate and immediate feedback. The characteristic of CAI program are self-paced or individualized instruction, allowing the learner to move at his or her own speed. The review of material in CAI can be done as frequently as necessary to master the content. It offers privacy for learning. There is no pressure to perform for teacher, no peer pressure, and mistakes are a private matter. CAI is interactive since it involves two-way communication between a student and a computer. Feedback about learning is immediate for individual with the computer instruction. This provide ongoing positive reinforcement for learning effort (Trirong Pimpa, B.E. 2537: 49).

In the third, providing a **developmental environment** is the preferred method of helping for promote dependent-care behaviors by allowing to the mothers to share and exchange their experiences by opening an avenue for closer relationships with doctors and nurses so that mother can express themselves and ask questions and by providing rooming in for the mothers and infant and gave the mothers a handbook which was derived from textbooks and the literature review. The researcher provides the premature infant cares' handbook for the mother to recall their memory about the premature infant care and provide the mother to practice her infant care. The fourth variation is in situations in which the mother is competent in premature infant care but requires periodic guidance that he or she is able to seek; in this variation, the nurse's role is primarily consultative. The researcher went to home visit mothers and their infant 1 week after discharge and provides telephone advice all time for consultative.

In view of the significance of the problem and conceptual thought as stated above, the researcher has believed the supportive-educative nursing system of Orem's theory for developing maternal caregiving behaviors to ensure the health outcomes of premature infants through activities that respond sufficiently to all of the premature infants therapeutic self-care demand sufficiently, as shown in Figure 1.

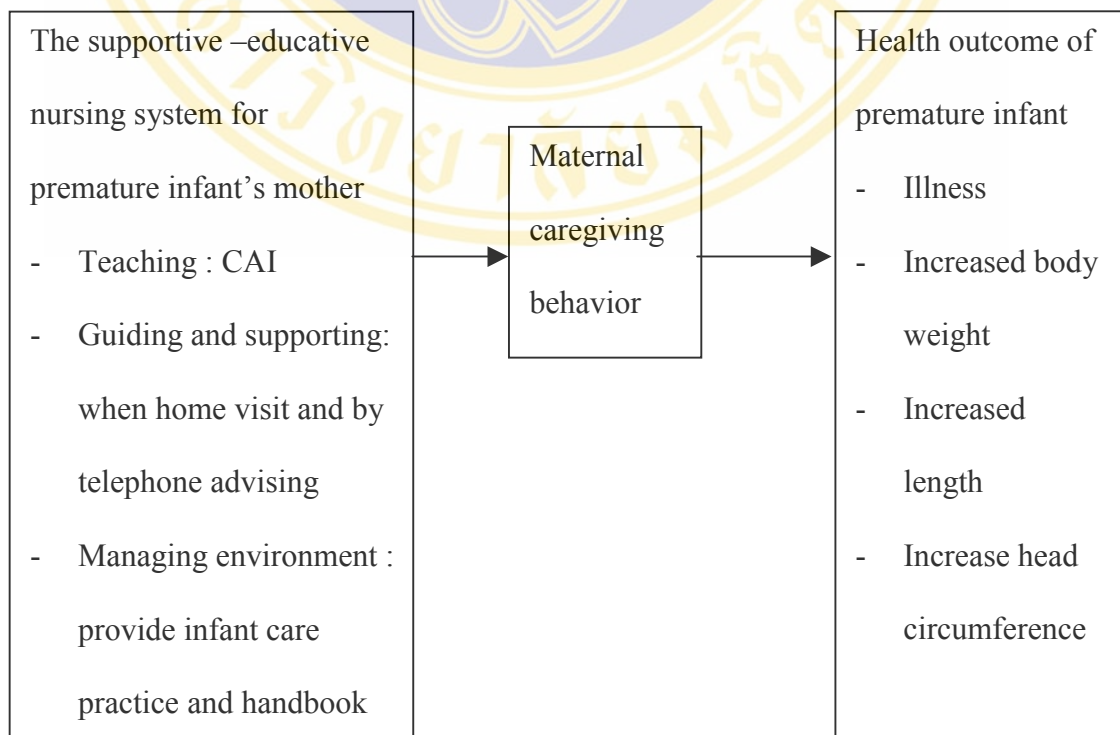


Figure I. Relationships between variables

Research Objection

1. To compare maternal caregiving behaviors of premature infant between the experimental and the control group at one month after hospital discharge.
2. To compare health outcome of premature infant between the experimental and the control group at one month after hospital discharge.

Research Question

How does the supportive-educative nursing system have an effect on maternal caregiving behaviors and health outcome of premature infant after hospital discharge?

Research Hypotheses

The hypotheses of the study are as follows:

1. The mean score of maternal caregiving behavior of the experimental group one month after hospital discharge is higher than of the control group.
2. The health outcome of the experimental group one month after hospital discharge is better than the control group.

Scope of the study

The purpose of this quasi-experimental research was to study the effects of the supportive-educative nursing system on maternal caregiving behaviors and health outcome of premature infant 1 month after hospital discharge. The sampling groups are the mothers of premature infants at neonatal care unit at Maharaj Nakorn Chiang Mai Hospital among 40 cases who were separated into two groups with 20 in each group between February – October 2003.

Significant of study

1. Guidelines for nurses in the supportive-educative nursing system in the nursing
2. care plan to effectively develop capacities in the premature infant care.
3. Learning and teaching tools for nursing students in the supportive-educative nursing system program.
4. Guidelines for nursing research on other problems concerning premature infant care.

Definition of Terms

1. Supportive-Educative Nursing System: nursing activities created especially to properly prepare the premature infant's mothers. This is based on Orem's theory by creating relationships, knowledge-giving using computer assisted instruction (CAI) and the handbook at the time of discharge, telephone advice, home visits one week after hospital discharge and also a schedule visit to the high risk clinic after one month. This nursing system starts from discharge planning date to one month after discharge.

1.1 Teaching is aimed at developing maternal caregiving behaviors by giving knowledge using CAI on the caring of premature infant, the physical condition, behavior that differs from normal infant, the premature infant daily care, (for instance, feeding, body clean-up, clothing preparation, home environment, sleep, elimination, mother and infant relationship, preventing infection, abnormal signs and symptoms. This also includes observing the infant, making an appointment with a neonatologist. The researcher is providing the mother to practice her infant care.

1.2 Guiding : is encouraging the mother of premature infant to make decisions about premature infant care, providing suggestions for the mother that will be suitable for practice including assessing the capabilities through and discussing their problems.

1.3 Supporting : is promoting and maintaining the mother's effort on the performance of premature infant care activity by creating relationships between the nurse, the mother, the family, and by enhancing morale with touching, words, and sympathetic expressions. This will fill the mother with belief and trust which will improve the quality of premature infant care.

The researcher uses guiding and supporting together when provides infant care practice before discharge, home visit at one week after hospital discharge, and telephone advising at all time for the mothers with the help of neonatal care unit nurses.

1.4 Managing Environmental Conditions: is a means to promote the Maternal caregiving behavior by allowing the mother to share and exchange experiences by opening an avenue for closer relationships with doctors and nurses. The mother could express themselves freely and ask questions, and by providing

rooming-in for the mothers and the infants , preparing practice infant care section and also giving the mothers handbooks which were derived from textbooks and literature review. The researcher distributed the handbook for home study.

2. Maternal caregiving behavior: is defined as the appropriate behavior of the mother in providing the following care for the premature infant:

2.1 Universal self-care requisites : refers to the following activities: daily care which includes infection control, bathing, clothing, feeding, sleep pattern, elimination, maintaining normal health by observing abnormal signs, physical check up, vaccination, protecting from infection, protecting from accident.

2.2 Developmental self-care requisites refers to the following activities: holding and touching, talking, eye to eye contact, facial expression (smiling), playing and promoting development by providing a fostering environment.

The maternal caregiving behavior of premature infant will be assessed using the maternal caregiving behavior questionnaire developed by the researcher. The maternal caregiving behavior questionnaire contains 19 items with a four scale response. Higher score means that the premature infant' mother has outstanding infant care behavior.

3. Health outcome of premature infant: refers to the health of the premature infant at one month after discharge. The health outcome of premature infant is divided into four parts as follows:

3.1 Infant illness: refers to the illness of the good premature infant such as fever, diarrhea, constipation, abdominal distention, vomiting, conjunctivitis, diaper rash , and thrush.

Assessment is based on 2 characteristic:

-No illness means that the premature infant is doing well

-Illness means that the premature infant is not well and may have a fever, diarrhea, constipation, abdominal distension, vomiting, conjunctivitis, diaper rash, thrush. Other illnesses will be assessed with the open-end questions for discussion and assessed Common problems in terms of “yes” or “no”.

Each illness will be assessed using the record form of health outcome of a premature infant after discharge for the mother developed by the researcher, high frequency of illnesses in each case means that the premature infant's health is not well.

3.2 Weight: refers to the body weight of the naked infant, measured in grams. The increase in weight of a premature infant at 15 g / kg / d is a normal rate (Klaus, & Fannarolf, 1993: 158).

3.3 Length: refers to the height of the infant measured in centimeters from head to heel, measured by having the infant lying down flat with straight legs and the foot's sole perpendicular to the floor on a scale platform. The increase in length of a premature infant at 1 centimeters / week is a normal rate (Klaus, & Fannarolf, 1993: 159).

3.4 Head circumference: refers to the head circumference measured in centimeters from the line above the eye-brow crossing the external ears to the occiput with the broadest part connecting at the starting point of the eyebrow. The increase in head circumference of a premature infant between 0.5 - 1 centimeters / week is a normal rate (Klaus, & Fannarolf, 1993: 159).

4. Usual Nursing Care : refers to activities by the nurses at the neonatal care unit including relating knowledge for infant care such as information of the discharged plan, premature infant care advice, practicing infant care activity which the mother could not perform or having low self-confidence about. The mothers had received the premature infant care brochure that created by the nursing health education of pediatric department. The contents of the brochure include: breast feeding, neonatal infection, hyperbilirubin, common problems, and daily care. The nurse will give the brochure (only) when the premature mothers mention their needs. At discharge, the premature infant's mothers will receive the newborn health book. After discharge, when the premature mothers have some problems about the premature infant care, they would contact the nursery nurse by phone for the answers: the nurses will give advice according to their individual knowledge and style. All the nurses are willing to give unlimited instructions about general hospital matters as often as needed.

CHAPTER II

LITERATURE REVIEW

The purpose of this study is to study the effective of supportive – educative nursing system on maternal caregiving behaviors and health outcome of premature infants after hospital discharge. In this study, the researcher has reviewed many medical journals, texts, database and researches concerned with nursing which are related to premature infant care covered the following topics :

1. Premature infant
 - 1.1 Growth and development.
 - 1.1.1 Factors Affecting Premature Infant's Growth.
 - 1.2 Problems and Characteristics of premature infant care in premature infant's mothers.
2. Needs and maternal caregiving behaviors of the premature infants' mothers after hospital discharge.
3. The supportive – educative nursing system.
4. Factors influencing maternal caregiving behaviors on premature infant care.

1. Premature infant

In this study the term " Premature infant " , is defined as a baby is at a gestational age or calculated pregnancy period of less than 37 weeks , regardless of the weight of the infant (Wilson ,1994 :365; Ashwill , & Droske , 1997). Gestational age can be assessed by the physical examination and a neurological examination. Several techniques have been applied to verify the state of an infant in a gestational state , such as Dobowitz , Ballard , and Usher , etc .

1.1 Growth of the Premature Infant

1.1.1 Body weight. Assessing on growth of the premature infant uses the body weight after delivery as standard (Whaley & Wong , 1995: 295). The premature infant will quickly lose of body weight after delivery and losses 12-15% of the first

body weight during the first 10 days after delivery. They may take 15 to 20 days to regain birth. The catch - up growth of very low birth weight infants may last 3 to 8 weeks, during which time they grow at rates of 15 to 25 g/kg /day (McMillan, DeAngelis, Feigin & Warshow, 1999 : 146). The loss of the body weight in the first 1-2 days shall be severe compared to the normal newborn infant. The weight reduction is due to losing water in excretion meconium, urination and breathing, infants without complications, it was found that 8-9 days after delivery there is a rise in body weight. The rate of increase of the premature infants will be faster than in normal newborns and body weight will increase fast in the first year at an average at 20-30 grams per day (Whaley & Wong, 1995:302). Gairdner & Fearson and Others (1971 cited by Samorn Yodpinij , B.E.2536:14) Summarized into 4 stages as follow :

1st stage : body weight decreases very quickly in the first 2-3 days after delivery.

2nd stage : about half of or the first week after delivery the body weight will increase with same growth rate as normal newborns and this period lasts about 2-5 weeks.

3rd stage : the infant at the gestational age of 34 – 40 weeks will have even faster growth rates.

4th stage : the infant's age is equivalent to matured gestational age of 40 weeks and the growth rate of the infant will be as the same as the normal newborn.

Weight gain is the most frequently used anthropometric. In preterm infants, weight gain should be expressed on a gram per kilogram per day basis. The table below lists suggested weight gain goal.

Table 1. Approximate Daily Weight Gain for Infants.

Age	Weight Gain
	g/kg/d
24-28 wk	15-20
29-32 wk	17-21
33-36 wk	14-15
37-40 wk	7-9
	g/d
4 wk-3 mo	30
3-6 mo	20
6-9 mo	15
9-12 mo	10
12-24 mo	6

Compiled from Babson and Benda: J Pediatr 89: 814, 1976; Nelson et al: Early Hum Dev 19:223; 1989; Shaffer et al: Pediatrics 79: 702, 1987 cited in Klaus, & Fanarolf, 1993: 158.

1.1.2 Body length or height. The premature infant has a large head, long body and the body center $\frac{3}{4}$ inch above umbilical. The body length will be slow in growing at the first, but the third week after delivery, The body length will grow at a normal growth rate of general infants with sufficient food substance. The length of the infant measured from head to heel measured by having the infant lying down flat with straight legs and the foot's sole perpendicular to the floor. After delivery, the length of infant will increase around 0.8 centimeters /week (Wright, Dawson, Fallis, Vogt Elania, & Lorch, 1993 : 922) or 1 centimeters /week (Klaus, & Fanarolf, 1993:159), and same as the full term infant on age 2 years after delivery.

1.1.3 Head circumference

The measurement of the head circumference shall be at the most-protuding occiput at frontal line above the eye-brow back to its starting point (Occipito – Frontal). A gain in length of premature infant is average 1 centimeter per week (Klaus, & Fanarolf, 1993:159). In case the head circumference increase less than 0.5 centimeter per week, that is the sign of microcephaly and the head circumference

increase more than 1.25 centimeter per week, that is the possibly sign of hydrocephalus (Varicha Jindamia, B.E. 2542:88).

Growth of premature and small-for-gestational-age (SGA) infants is assessed by comparison with the intrauterine and postnatal growth of full-term infants (Peterson & Frank . 1987 in Taeusch & Yogman (Ed.):188).

Table 2. Mean preterm growth velocities have been derived from several reference data set.

Mean preterm growth velocities				
Measurement	28-32 wk		32-36 wk	36-40 wk
Weight (g / day)	24.0		30.0	28.0
Length (cm / wk)	1.2		1.2	0.6
Head circumference (cm / wk)	0.9		0.8	0.4
Peterson & Frank . 1987 in Taeusch & Yogman (Ed.).pp.188.				
Median (50 th percentile)	0-6 mo	6-12 mo	12-24 mo	24-36 mo
postterm growth velocities				
Weight (g / day)	23.0	14.4	6.8	5.5
Length (cm / wk)	2.8	1.6	1.0	0.7
Head circumference (cm / wk)	1.4	0.7	0.2	0.1
Peterson & Frank . 1987 in Taeusch & Yogman (Ed.).pp.188.				

Casey , Kraemer, Bernbaum , Tyson , Sells & Yogman (1990:330) had studied growth patterns of low birth weight preterm infants. They monitored 608 infants longitudinally in 20 eight-site collaborative program. Ninety-nine infants weighed $\leq$ 1,250 gm at birth, 289 between 1,250 and 2,000 gm and 220 infants between 2,000 and 2,500 gm. Weight, height and head circumference were measured at birth and at 40 weeks and 4, 8, and 12 months of gestation – corrected age on at least 553 infants each time. They found that growth rates of weight, height, and head circumference in birth weight between 2,001 and 2,500 grams divided by sex are as follow :

Table 3. Growth rate of weight , height and head circumference by birth weight 2001-2500 grows and sex.

Growth rate	Male	Female
Weight (g / day)	17.1± 2.8	15.7 ± 2.7
Length (cm / wk)	0.068 ± 0.01	0.065 ± 0.01
Head circumference (cm / wk)	0.030 ± 0.00	0.028 ± 0.00

Casey – Kraemer , Bernban , Tyson , Sells & Yogmon , 1990 : 303

1.2 Growth Problem

Growth is influenced by many factors, including health status, birth weight, gestation, genetic makeup, severity of neonatal course, home environment, and postnatal nutrition and care . In general, the preterm infants of more than 34 weeks' gestation who are appropriate for gestational age (AGA) will tend to grow at the same rate as a full-term infant of the same postconceptional age. These infants tend to be at approximately the 50th percentile for length but slightly below the 50th percentile for weight by 40-42 weeks' postconception.

Very low birth weight (VLBW) infants will take longer to achieve their original growth potential. Growth spurts often are seen between 36 and 50 weeks' postconception and especially in VLBW and small-for-gestational-age infants at 6-9 months of age. Most preterm infants catch up in body growth by 2-3 years. By 3 years of age , only 20% of AGA preterm infants are below normal growth (versus about half of small-for-gestational-age infants) , and most of these catch up by 7-8 years (Kitchen et al., 1992). Corrected age should be used for at least the first year. Manser (1984) recommends that for VLBW infants, corrected age should be used until 24 months after term in evaluating weight, 3.5 years for length (height), and 18 months for head circumference (Bernbaum, et al., 1989: 195-206; Blackburn, 1995 :47).

As said above it was found that the growth rate change or increase of body weight, height and head circumference will not be evident in the first week, but will be remarkably changed in the second week after delivery and in the sixth week after laboring the growth will be double that of the period just after birth. So, in assessing growth rate of the premature infant, the researcher has chosen to assess the group of

infants delivered and discharge from the hospital at 4 weeks and infants age about 40 weeks. Although all infants have their development growth, there are certain factors that influence the physical growth of the infants which different as follows.

1.3 Factors Affecting Premature Infant's Growth

1.3.1 Biological Factors

1.3.1.1 Hereditary. Heredity influence to growth The physical features and psychological and chemical and biological substances within the body will be decided by transfer of genes from their parents (Whaley & Wong, 1995 ; Bernbaum, 1999 : 1463). The transfer of genes is also a controlling factor on growth rate, size and final shape of a person. Environment has a major impact in enhancing a person's development growth to the maximum point (Whaley & Wong, 1995; Bernbaum, 1999 : 1463).

1.3.1.2 Sex. There is a difference in growth between male and female infants due to hereditary traits transferred. On average, male infants have a slightly faster growth rate than female infants until about 7 months age when there is equivalent growth rate.

1.3.1.3 Food. Food is important for growth through sufficient and appropriate food substance intake helping the body to receive necessary food substances for physiological growth, complete both physically and mentally. Opposite, insufficient food substance both in quantity and quality shall retard growth of the infant affecting the infant's brain growth and behavioral development inappropriately. The severe malnutrition in early childhood results in less body weight, length, and head circumference than other infants of same (Bernbaum, 1999 : 1463; Rattanaopas, 1991 : 26). This factor is controlled by having the infants under the same nursing care unit.

1.3.1.4 Performance of various glands. All glands in our body have their part in physiological growth for instance, anterior fontanel of the pituitary gland controls the flow of hormones helping growth, with its suitable flow of hormones the body grows properly. In case of excessive flow, the body will grow more than its ordinary size or grow less flow of hormones. In addition, there are other glands such as, parathyroid hormone produces calcium which if not sufficient for the body's use will retard the infant's development and result in weak bones.

1.3.1.5 Health : the infants with strong health and little sickness will grow better than the infants with frequent and severe sickness with certain chronic disease (Bernbaum,1999 : 1463) In this study the researcher has selected the sample groups from mothers of premature infants without complication, not admitted at National Intensive Care Unit (NICU), and with gestation age and body weight in proximity to each other.

1.3.2 Psychological and Emotional Factors. Infants with certain emotional effects or without clear mood resulting from not having been responded to in emotional needs, or from lack of love and affecting, or lack of parental attention can cause the body to produce too much steroids from the adrenal gland and this substance will regard the hormones for body growth (Hurlock, 1978 cited by Patsanee Rattanaopas,B.E. 2531:27).

It was found that besides the biological factors (hereditary, sex, food, performance of various glands and health); psychological and emotional factors are very important to the growth of the infants. The researcher control these factors by using research design. The researcher has therefore considered that the supportive-educative nursing system for the mothers of premature infants will be of assistance in responding to the maternal behavior of the premature infants with appropriate health outcomes.

2. Needs and Maternal Caregiving Behaviors of the Premature Infants' Mothers after Hospital Discharge.

2.1 Premature infant's mother needs before and after hospital discharge. Prerequisites for discharging premature infant of Maharaj Hospital, Chiang Mai are as follows. The mother should be able to take care of her infant by herself. When the infant is being discharged, it will create additional stress for the mother. There are several reasons for this. For instance, the mother is concerned about the fact that she won't be able to take care of an infant that is quite small and delicate. She is also afraid that the infant might die. Furthermore, there is also an issue of the infant developing at the rate that is somewhat slower than a typical infant. In addition, the mother might be worried about behaviors of the infant that she won't be able to interpret. Daily life activity and personal habits of the mother will also change such as

sleeping pattern. Personal time and time with others will also diminish (Brooten et al., 1988:213; Gennaro, et al., 1992: 39). All of these factors contribute to lessen the confidence of the mother on the ability to look after her infant. (Kenner & Lott, 1990: 31-37; Kenner, & Brueggemeyer, 1993 : 1060; Jutarat Mesukko, B.E. 2540) These conditions can influence a mother's interest and the way she cares for her infant. And from these reasons a mother needs information on how to look after premature infant. According to a 1993 study by Mckim(pp.90), the result shows that a mother need information about premature infant on its health, development, pattern of behavior, and problems about illnesses. If a mother did not get additional information, she would get stressed out, and loses her confidence in looking after her infant. Furthermore, Simone (1986 cited in Kenner, & Bagwell, 1993: 1134-1147) stated that an important cause of stress and anxiety is the fact that the mother is used to rely on the help of nursing staff, so when she has to do it herself, she feel trouble by it. Therefore, a woman must adjust herself to a new role as a mother and learn about the behavior of the infant which does not create a fostering relationship between the two parties, and eventually lead to improper caring for the infant. In many cases, the infants are also being neglected and abused (Costello, & Chapman, 1998: 37-42). In Thailand, Jutarat Mesukko did a study in B.E. 2540 about the need for information and the support for a mother with premature infant after hospital discharge found that the mother needed the following information: information about both breast feeding and formula milk, supplementation, sleeping and waking up routines, crying pattern, health problems, vaccination, benefit and justification of a regular check up, the development of the infant, training on giving a bath, chest physiotherapy, taking care of jealousy problem from an older child on the infant, and the need to look after herself. The need for information will go according to the problem with the infant especially if an infant is sick or there is some abnormality that has not been taking care of. It also has to do with problems that arise from caring for the infant and problems about the way the mother takes care of herself. In addition, a mother needs help emotionally, financially, and also with (things and labor). Emotional support could come from the husband, grandmother of the infant, hospital staff, neighbors, and relatives, which goes according to studies in other countries with mother in the same predicament (Bissell, 2002: 76-81). These initial data enable nurses in neonatal

care unit to see the importance of helping and supporting the mother of premature infant to alleviate the stress and anxiety and increase confident in caring for her infant. This is accomplished by arranging time to provide the knowledge and necessary skill for infant care. (Kenner, Bagwell, 1993: 1134-1147; Wilson, 1994: 365-432; Bissell, 2002:76-81).Getting the mother ready is therefore an important part of discharge planning.

2.2 Maternal Caregiving Behaviors of the Premature Infants' Mothers after Hospital Discharge.Due to the undeveloped central nervous system, premature infant behaviors are different from full-term infants. Some behavior appearance be represented as their needs and sometimes the meaning is lost. Premature infant's mother must consider 3 aspects of dependent care: universal self-care requisites, developmental self-care requisites, and health deviation self-care requisites. This study assessed only 2 aspects of dependent care: universal self-care requisites, developmental self-care requisites. Because some subjects do not become ill, the researcher could not make the assessment.

2.2.1 Home environment.The infant's bedroom should be well-regulated and situated away from the direction of incoming wind to avoid pollen, dust, ash, smoke. Smoking should not be allowed in the room and the temperature should not be too hot or too cold. The infant should have its own room and not share with others. Preventive measures should be taken to avoid accident other hazardous causes such falling of the bed or insect bites.

2.2.2 Clothing and other necessities.A room temperature of about 37° c is warm enough for the infant. The infant should be dressed according to the way the parents want, with an addition of a receiving blanket. The abdomen area should be thoroughly checked for warmth. The hands and feet will be slightly cooler than the rest of the body, but they should not be mottle or blue. The infant's head should be kept warm as there are many thermal skin sensors around that area. On a cold or windy day, the infant should have a hat when out and about. Clothes and towels should be made from soft fabric especially for infant and should be used according to the climate. Washing should be done using detergent that is light and non-irritable. Shirts or blouses should be easily put on with as little seam as possible, and should not have buttons or decorative features that are made from metal which may come off

easily and could be dangerous. When using diaper, make sure the pin is tuck away securely. As for other items such as bath tub, and bathing accessories, they should be easy to clean and convenient for keeping.

2.2.3. Feeding. Sucking and swallowing delay such as in milk suction is typical among the premature infants in the first 1-2 months. More over, the most naturally spend most of their time in sleep. Which reduces milk taking. Therefore, the babies should be stimulated to suck milk at least 8 times per day. If a baby sleeps for more than 2-3 hours, she or he must be awakened in order to be fed. When a baby awakes it does not mean that she or he is hungry. However, such indistinct behavior of a baby may confuse. The mother who may make a wrong response to the baby's needs.

At first 1-2 ages month, the premature infant have slow sucking and need feeding more frequency than term newborn because most of them fall asleep. The waking up period is too short that make them received feeding not enough (Gorski, 1988: 27-32).

2.2.3.1 Breast feeding helps form good relationship between the mother and her infant and also provides the infant with immunity against infection. During the initial period of breast feeding, the mother has to have time and patience because the infant will be quite slow in taking in the milk and may stop quite often. The mother will have to stimulate by touching the infant gently under its chin or slowly turning the nipple while it is in the infant's mouth. The infant will receive a lot of milk if the surrounding environment is quiet with no talking or playing during feeding time. When the infant is awake and active, the infant should be fed 8-12 times per day with 1.5-3 hours interval between feeding. (Deacon, 1999: 359; Lynch, Kordish, & Williams, 2001: 393; Kannikar Vichitsukon, and Daranee Sayawan , B.E. 2528).

2.2.3.2 Formulated milk is used when necessary and the formula should be for premature infant because it has higher concentration of protein, energy, calcium and phosphorous than regular formula. When preparing the formula, care must be taken to ensure that the equipments are clean, and the pacifier is the kind that is used for infant. At the beginning, the pacifier should be soft and short. After that the mother could experiment with many types of rubber nipples to see which one the infant prefers. For infant that could not have enough power to suck or could only

lightly suck, a bigger hole should be made on the rubber nipple. One thing to watch for is the size of the hole. If it is too big, the milk could come out very fast, and the infant could aspiration. The temperature of the milk should be varied from warm to cool or at room temperature. While at the hospital, premature infant is fed every 2-3 hours and each feeding last about 40 minutes or less. The quantity of milk taken in at every feeding will be different, but this is nothing to worry about. The mother should concentrate on the quantity of milk and the increase in weight per day. In general, healthy premature infant needs about 110-150 calorie per kilogram per day or 6-7.5 oz per kilogram per day. (Bernbaun, 1999: 1463; Deacon, 1999: 359; Lynch, Kordish, & Williams, 2001: 394).

2.1.3.3 Solid food should be given when the infant are able to support its head and neck or the infant could sit up with the help of the mother. The approximate time frame for this is about 4-5 months after birth. (Berger & Schaefer, 1985:200-202).

2.2.4 Stool Pattern

Formula-fed infant generally passes at least one stool each day whereas breast-fed infant may pass a stool after every feeding or, occasionally, only on every 2 to 3 days. Infants may become red in face and appear to be straining when having a bowel movement which is normal behavior and does not indicate constipation. It is the consistency of stool rather than the number of times that is important. Stools that are dry, hard, and marble-like indicate constipation.

Watery stools indicate diarrhea. A watery stool is absorbed into a diaper with little or no solid material left at the surface. A “water ring” remains on the diaper, showing where the liquid was absorbed. Diarrhea stools occur more frequently than normal stools and are greenish because of bile moving quickly through the intestines. Diarrhea in infant can be serious because life-threatening dehydration can develop very quickly. Infant with diarrhea should be taken to pediatrician or nurse practitioner for treatment. (Gorric; Mckinney; Murray, 1994:602-603).

Infant fed with mother’s milk passes about 2-3 stool per day, and the stool are soft, yellowish with fine texture. Infant fed with Formula passes about 1-2 stool per day and have harder stool. Normally the infant should pass stool everyday, but for each infant there is a unique pattern for passing stool. The mother should pay

attention to her infant's stool pattern and unusual stool such as liquid stool, stool with blood mucus, or constipation. As for urination, the infant urinates about 2-6 times per day, and the number of times usually indicates whether enough water has been taken in by the infant. If the infant does not urinate in 12 hours, a report should be filed to the doctor. (Deacon, 1999:357).

2.2.5 Sleep. Premature infants require 17.57 sleeping hours per day, while the full term infant requires 14.78 sleeping hours per day (Ardura, Anders, Aldana and Revilla, 1995:484-489) the awaken cycle of the premature infant and the full term infant are also different; 55 minutes for the premature infant and 90 minutes for the full term infant. In the first 3-4 months after delivery, a premature period is short. Babies, especially premature infants with less 36 weeks gestational age seem to sleep all the time because eyes movement, physical movement, breathing, and muscle tone fail to work in coordination.

During the early stage of bringing the infant home, the mother should set the environment so that the infant could adjust to day time and night time. During the day, the door and window should be open to let some light into the room. During the night, the room should quiet, free from disturbance, and have as little light as possible. Sleeping position should be altered if the baby is laying face down to make sure that nothing will block the air passage. Premature infant usually sleeps a lot, so if the infant sleeps pass her feeding time, the mother should wake the infant up for feeding. The mother should also check whether the diaper is wet to prevent infection around the bottom.

2.2.6 Taking the infant for check up. The high-risk infants often experience continuing health problems after discharge and have a higher rate of re-admittance to hospital during the first year of life. These infants also are at greater risk for neurodevelopmental problems, including language, learning, and school difficulties. Major neuro developmental sequelae of preterm birth include cerebral palsy, developmental retardation, sensorineural hearing loss, blindness, and hydrocephalus. This sequelae usually can be diagnosed by 1-2 years of age or earlier. Preterm infants are a readily identifiable group with a frequent need for multidisciplinary follow-up (Blackburn, 1995: 43-44).

The mother should take the infant for a regular check up that has been scheduled with the doctors to evaluate the growth and development, to look for irregularity, and to receive advice on proper infant care according to the age of the infant.

2.2.7 Vaccination and caring for the infant after vaccination. As a group, preterm infants tend to be underimmunized. The Guidelines for Perinatal Care (American Academy of Pediatrics / American College of Obstetricians and Gynecologists (AAP/ACOG,1992) recommended that all neonatal intensive care units develop and implement a policy for immunization of preterm infants. Preterm infants can be given full-dose diphtheria-pertussis-tetanus (DPT), oral polio vaccine (OPV) and other immunizations at the same chronologic age as term infants. Immunizations may be delayed until the infant develops adequate muscle mass. Usual precautions/contraindications for pertussis immunization are followed.

Preterm and term infants respond similarly to these immunizations in developing and antibody response. However, preterm infants are more likely to need the entire series of injections to develop an adequate antibody response. Preterm infants have been reported to have fewer febrile or local reactions to DPT injections than do term infants, probably because of immaturity of the preterm infant's immune system.

Premature infant should be given all the vaccines just like regular infant without having to worry about the age. After receiving vaccine, the infant may have a fever, so the mother should towel-cleaned the infant and provide the infant with medication as suggested by the doctor.

2.2.8 Giving medication. Anemia: hemoglobin levels decline in all infants during the first 2-4 months after birth. This decline results in the "physiologic anemia of infancy". These naturally occurring anemia results from postnatal suppression of hematopoiesis. The decrease in hemoglobin cannot be prevented by administration of nutritional supplements, such as iron, vitamin B12, or vitamin E (Blackburn, 1995: 44). Almost all preterm babies will develop anemia over the first few weeks and months of life. For most, it causes no problems and gradually goes away on its own (Madden, 2000: 73).

Iron supplementation generally is started before the point of depletion to maintain and build up the infant's stores. The American Academy of Pediatrics (AAP)

recommends that term infants receive iron supplementation by 4 months and preterm infants by 2 months of age. Forms of supplementation include drops, fortified cereal , and fortified formula(Blackburn, 1995: 4).

Before discharging from the hospital, an infant may receive vitamin and iron supplement. The mother should make sure that the infant takes the medication on time with the dosage suggested by the doctor. In general, the infant does not need any medication.

2.2.9 Preventive measures against infection. Premature infants are susceptible to all types of disease and are at a high-risk for infection during the first year of life due to and incomplete immune system, and reduction of immunoglobulin G (Ig G) and immunoglobulin A (Ig A) levels that prevent the respiratory tract infection and gastrointestinal tract infection, including reduction in T lymphocyte that resists virus infection and increase immunoglobulin production. In a natural process, infants receive immunoglobulin G from the mother through the placenta during pregnancy. Immunoglobulin G level are found at higher levels in fullterm infants, about 90-95 percent, while it is lower in premature infants. Lack of which causes physiologic hypogrammaglobulinemia. Immunoglobulin G is at the lowest level during the age of 2-4 months and it will be at a constant level until the infant is one year old. (Blackburn, 1995: 44). The vulnerabilities in host defense mechanisms, along with immaturity of the respiratory system and continuing recovery from earlier health problems, increase the risk of respiratory infections. Preterm infants have more upper respiratory infections, nasal congestion, and lower respiratory infections during the first year of life. Lower respiratory infections, such as pneumonia or bronchiolitis, may occur alone or secondary to an upper respiratory tract infection. The incidence of lower respiratory tract infections is higher in infants with a history of respiratory distress syndrome or bronchopulmonary dysplasia. Preterm infants also are more likely to have acute or chronic serous otitis media. Chronic otitis media may lead to conductive hearing impairment and language difficulties (Blackburn, 1995 : 45)

The infant should stay away from people any form of infection which means that the mother should not take her infant to crowded places or places with poor circulation. (Thureen, Deacon, O'Neill,& Hernandez, 1999: 396) Mother who perform many activities should wash her hands properly before handling the infant,

and when the weather becomes cooler, the mother must make certain that the infant is warm.

2.2.10 Warning signs to look for after the infant return home (Thureen, Deacon, O'Neill, & Hernandez, 1999: 394; Timsuwan, 1987)

2.2.10.1 Taking in less milk or not taking in any milk, inactive, and dry skin.

2.2.10.2 Passing stool too frequently, having a lot of liquid stool, mucus and bleed in the stool.

2.2.10.3 Vomiting too frequently.

2.2.10.3 Has a temperature, after towel-cleaned the temperature still high or decrease.

2.2.10.4 Erythema, condition does not improve after soaping but worsen and have yellow skin.

2.2.10.6 Having difficulty breathing.

2.2.10.7 Convulsion, inactive.

2.2.10.8 Umbilicalitis.

2.2.10.9 Body temperature change, having fever, the body feels cool.

If the infant has any of these warning signs, the mother should take the infant to the nearest health service center, hospital, or clinic. In the case where telephone consultation is needed, the mother could contact the hospital staff at any time.

When to seek immediate Help. Mothers should take the infant to the pediatrician or to an emergency room if there are signs of dyspnea. An infant from birth to 3 months of age should not have a sustained respiratory rate above 60 breaths / minute. If there are retractions, cyanosis, or extreme pallor, parents should get immediate help. If respiratory difficulty occurs suddenly in an infant who is well, the infant may have aspirated a feeding or small object. If an infant's respiratory rate is below 30 parents should stimulate the infant and see if the respiration increase and stay within normal range of 30 to 60 breaths / minute. If the respiratory rate continues to be below normal, the infant should be seen by a pediatrician .

2.2.11 Accident prevention includes aspiration and obstruction. Aspiration is prevented by having the mother pick up the infant while feeding. After feeding is done, the mother should try to make the infant burp. When putting the infant to sleep,

the sleeping should be arranged so that infant is lying on its side. In the case where the infant has aspiration, a bulb syringe should be used to take out the remainder of the milk, mucus and saliva from the nose and mouth. If that does not help and the infant is going into cyanosis, the mother should bring the infant to the hospital. In the case of obstruction, the best way to prevent it from happening is to have bedding that is not too soft.

2.2.12 Daily infant care.

2.2.12.1 Feeding. The infant should be held gently and with care, so that the infant could sense a feeling of warmth, protected, trust and emotionally stable. Infant being held with care will cry less than infant who has not been held. Most often use positions are:

2.2.12.1.1 Holding the infant in both arms position. This is a typical position that is used during feeding time.

2.2.12.1.2 Burping position. There are two ways of doing it. First, have the infant sit on the mother's lap, use either hand to push the infant forward just a little, the other hand touch or gently pat on the area of the back. Care must be taken to make sure that the patting is done gently. Otherwise, there might be milk that comes with the burp as well. The second way is accomplished by placing the infant over the mother's shoulders, gently pat the back.

2.2.12.1.3 Eye contact position. Use one hand to support the head and shoulders, the other hand to support the bottom and legs, lift the infant, turn the infant to face the mother, make eye contact.

2.2.12.2 Comforting a crying infant. Ensure parents that they will soon learn to distinguish hunger and pain cries from fussy behavior. All infants cry in the early weeks of life for many reasons including hunger, discomfort, fatigue, boredom, and over stimulation. Sometimes no specific cause is determined. Infant cry approximately 60-90 minutes a day during the first 3 weeks of life. By 2-3 weeks of age babies begin a different type of crying that is fussy in nature. It may occur at the same time every day. Usual comfort measure may not stop crying. Once causes for crying have been eliminated and comfort measures tried, the infant may need to "cry it out" and can be placed in their crib in a quiet room. Crying may increase to 2-4

hr/day by 6 weeks and gradually decrease by 3 month of age. (Deacon in Thureen, Deacon, O'Neill Hernandez, 1999:360).

Colic is characterized by irritable crying for no obvious reason, which usually occurs during the late afternoon or early evening and lasts 3 to 4 hours or longer. It occurs in 10 to 20 percent of all infants (Foye and Sulkes, 1990 cited by Gorrie; Mckinney;& Murray, 1994:597), beginning in the first 2 or 3 weeks of life. Although it usually ends about 3 months after birth, some infants continue to have colic until 6 months of age. The infant is in good health, eat well, and gains weight appropriately, despite the daily crying episodes.

Although many theories have been investigated, the cause of colic remains unknown. Allergies, poor feeding techniques, parental tension, and exposure to smoking have all been considered. Colic may be due to immaturity of the gastrointestinal tract or nervous system or to a combination of factors.

Infants with colic cry as though in pain, draw their knees onto the abdomen, and may pass flatus. The crying is intense and may last until the infant falls asleep exhausted. Because continuous crying causes a great deal of parental distress and may be a factor in parenting disorders or child abuse, it is important that nurses provide support to parents of colicky infant. (Gorrie; Mckinney; & Murray, 1994:597)

To be able to properly comfort the infant, the mother should pay attention to the different types of cries, the sound, and the reason for crying. Comforting the infant can be accomplished by picking up the infant, swing the infant around very lightly, walk around while holding the infant, talk and sing to the infant, make funny sound or let the infant suck on the rubber nipple and reduce stimulation in the form of light, sound or activity in the room. (Thureen, Deacon, O'Neill,& Hernandez, 1999: 388).

2.2.12.3 Changing and putting on diaper. Premature infant is small and should have diaper change as soon as the current diaper is wet, even while the infant is sleeping to prevent heat loss and keep the genitalia area dry and clean at all time. (Thureen, Deacon, O'Neill,& Hernandez, 1999: 388).

2.2.12.4 Giving bath. Bathing is not necessary because the infant is very small, but if it has to be done, warm water should be used, and it should not take too long. Bathing position or Ball handling position is done by supporting the head and shoulders of the infant with the writing hand, lift the torso of the infant and hold it

between the body and upper arms of the mother. While giving a bath, the mother should keep an eye on any unusual behavior of the infant. In the case where the umbilical is not dry, it should be cleaned with 70% cleaning alcohol. Do not put talcum powder on the infant's umbilical. As for hair wash, it should be done 2-3 times a week to get rid of fat that looks like thin white sheets that attach itself on the infant's head which causes abrasion to the skin underneath. The best time for baths is in the afternoon when the weather is not too cool. Baths should be given in a clean, well lit place with no wind or fan because the infant could easily shiver. (Deacon, 1999: 356; Kannikar Vichitsukon, and Daranee Sayawan, B.E. 2528: 152-167).

2.2.13 Encouraging mother-infant interaction. Parental attachment is the parents' affectional tie to the fetus and infant. Bonding is considered as a sensitive period early in the postnatal period in which parents forms an emotional tie with their infant (Klaus and Kennell, 1982). An important part of attachment is acquaintance (infant (Klaus and Kennell, 1983). Parent use eye contact, touching, talking, and exploring as they become acquainted during the immediate post-birth period. Preterm infants are difference from the full term infants in several ways that have a tremendous influence on the parent-infant interaction . Preterm infants are less neurological mature than full-term infants. This lack of maturity produces infants who are less regulatory in their behavior, making it harder to understand, and predict how they will behave. Preterm infants as a group exhibited a lower level of behavioral social responsiveness, were less persistent and adaptable, and tended to respond in more negative ways than full-term infants. These characteristics result in infants who give hard to read cues, making it difficult for their mothers to know when to feed, when to soothe, when to leave them alone, and when to play with them. Preterm infants, sensitive to stimuli and limited in energy reserves, respond to their mothers attempt to interact by turning away, dropping off to sleep, or crying inconsolably, behavior mothers see as negative and difficult to cope with and understand. These characteristics of giving unclear cues and being more negative and less socially responsive may also account for the report by parents of preterm infants that they are harder to care for and have a more difficult temperament than full-term infants. Several researchers have studied the the temperament of preterm infants. In general, theirs finding suggest that the older (34 to 37 weeks), heavier (>1200 g), and healthier

preterm infants show no differences in temperament from term infants by parent report, whereas the younger (<34 weeks), lighter (<1200 g), and sicker preterm infants are described by parents as being more difficult in temperament than those in reports by parents of full-term infants. (Johnson-Crowley, 1993:1057). Attachment (bonding) behaviors are define as eye to eye contact(en face position), psysical contact (holding, touching), talking to the baby and calling the baby by name, and initiating care as appropriate(Wong, & Perry, 1998:300).

The mother should perform as follows:

2.2.13.1 Touch. The mother should use her fingers to touch the arms or legs by having one of the hands touching the infant at all time to get a continuous sense of touch and creating a sense of security Then use the palm of the hand to touch the head and body of the infant. In the case of very small premature infant, the mother should put clothes or blanket on the infant to prevent heat loss. The infant would hold the mother's hand or pull her hair in return.

2.2.13.2 Eye contact is very important for developing relationship between the mother and the infant. The mother would speak to stimulate the infant to open its eyes, so that she could clearly see her infant's eyes. Bonding and attachment between the mother and her infant could be expressed through facial expressions.

2.2.13.3 Voice. The mother should talk to her infant in a higher voice in order to stimulate the infant, and the infant would also follow the voice.

2.2.14 Common health problems in the premature infant and first aid. The mother should be able to observe various abnormalities and in a position to provide basic first-aid. If symptoms still persistent, the infant should be immediately taken for a check-up at the nearest health care location such as Health care center, Public Health Service Center, or a hospital. Abnormal symptoms which are usually found are:

2.2.14.1 Fever. An evaluation in set point such that body temperature is regulated at a higher level; may be arbitrarily defined as temperature above 38°C (100° F) (Wong & Perry, 1998: 1387).The cause of fever could be from an infection, dehydration or post received immunization. The solution for the mother is to use a piece of cloth soaked with water and apply this to the body and other areas; such as

neck and ankles. This will reduce the heat in the baby's body. If the temperature is not cool down, then the infant should be taken to a doctor.

2.2.14.2 Common cold. The cause of such an illness can be from a virus or bacteria infection. In such a case, a baby may suffer from catarrh, fever cough and sneeze. The solution for fever is to wipe with a tepid sponge. If the baby has catarrh and has difficulty in breathing, the air way should be cleared by using a small rubber pump for suction. Then, the baby should be taken to see a doctor. A baby should not be taken in to a crowded area because he or she might be the carrier of disease or may be infected by a new disease.

2.2.14.3 Conjunctivitis. This is an eye infection. In such a case, the baby's eye turn red and are filled with tears. There is a lot of discharge, sometimes with pus. Accumulated secretions are always removed by wiping from the inner canthus downward and outward, away from the opposite eye(Wong & Perry, 1998: 1181-1182). It is best for the mother to clean the eyes with absorbent cotton soaked in boiled water. The cleaning technique is to clean the eyes, should be repeated with new absorbent cotton. The baby should then be taken to a doctor.

2.2.14.4 Thrush. It is characterized by the appearance of white plaque oral mucosa, gums, and tongue. The white patch can not be remove and tend to bleed when touched. In most cases the infant does not seem to be in discomfort from the infection. A few infants may have some difficulty swallowing. Intervention include maintenance of scrupulous cleanliness to prevent re-infection. Good hand-washing technique is always essential. Clean surfaces should be provided for neonates. Proper cleanliness of the equipment and environment is ensured. If the infant is breastfeeding, the mother is also treated with topical nystatin (Wong & Perry, 1998: 758).In case the symptoms are serious, the baby should be immediately taken to a doctor.

2.2.14.5 Diaper rash. The warm, moist atmosphere created in the diaper area provides an optimal environment for candidal growth. The dermatitis appears in the perianal area, inguinal fold, and lower abdomen. The affected area is intensely erythematous with a sharply demarcated, scalloped edge, often with numerous atellite lesion that extend beyond the larger legion. The usual source of infection is through the gastrointestinal tract during delivery. It may also appear 2 to 3

days after an oral infection. Therapy consists of application of an anticandidal ointment, such as nystatin or clotrimazole, with each diaper change. Sometimes the infant also is given an oral antifungal preparation to eliminate any gastrointestinal source of infection. Immediately washing and drying the wet and soiled area and changing the diaper after voiding or stooling prevent and treat diaper rash. Mother can be placing the infant in a warm room with the buttocks exposed to air or even filtered sunlight can help dry up diaper rash (Wong, & Perry, 1998: 645).

2.2.14.7 Abdominal distention. This is caused either because there is too much air in the baby's stomach while sucking milk, or because of a malfunction of the gastrointestinal track system. In its cause, where a baby swallows air while being breast fed, it is best for the mother to let the baby's mouth take most of the areola so that there is no space for gas to get into the stomach. Protuberant contour of the abdomen that may be caused by delayed gastric emptying, accumulation of gas or stool, inflammation, or obstruction (Wong, & Perry, 1998: 1387). To help a baby belch, put the baby on the shoulder or make the baby sit upright leaning in a forward position while gently touching his or her back. If after first aid, the symptoms associated with any abnormality such as vomiting or constipation do not subside, the baby should be taken to see a doctor.

2.2.14.8 Diarrhea. Diarrhea is caused by gastrointestinal (GI) tract infection, or allergy to formula milk or receiving too concentrated formula milk. The baby will have an increase in stool frequency with the stool having increased water content. The color and smell of stool may be abnormal and might have indication of blood and mucous. In the case of acute diarrhea the baby may have symptoms of dehydration such as sunken eyes, sunken fontanel, or loss of skin turgor. Increase in the number of stools with an increased water content as a result of alterations of water and electrolyte transport by the GI tract; may be acute or chronic (Wong, & Perry, 1998: 1387). It is best for the mother to continue breast feeding while giving diluted mixed milk to the baby who is fed with mixed milk. In case of a premature infant suffering from these symptoms, it must be immediately taken to a doctor, because the symptom in a premature infant will be more serious than that of a normal infant.

2.2.14.9 Constipation. It normally occurs in a baby fed with mixed milk, because the baby cannot digest lactose or some nutrient in the mixed milk. The

baby will have difficult bowel movements. Sometimes, there will be signs of blood associated with the stool, because the hard stool might irritate the anus wall. In such a case, the mother should continue to feed more milk, so that the baby will receive more liquid. If the symptoms of vomiting and distention persist for a long time, the infant should be taken to a doctor. Do not SSE or administer a purgative to an infant.

2.2.14.10 Vomiting. This is caused by peristalsis of the stomach and abdominal muscle. The reflex of the stomach is to eject the food through the mouth. The vomiting of a premature infant may be caused by imperfect working of the stomach sphincter, or malfunction of gastrointestinal tract and nerve system. Regurgitation is the result of decreased lower esophageal sphincter tone, alternations in esophageal motility and peristalsis, delayed gastric emptying, and a tendency toward reverse peristalsis. Intervention to reduced regurgitation include frequent burping; feeding slowly in a semi-upright position (reduces air swallowing and passage of swallowed air into the duodenum); smaller, more frequent feedings; and prone or right lateral position after feeding to enhance gastric emptying. Gastroesophageal reflux is the flow of gastric content into the esophagus, which often is accompanied by regurgitation that may be accompanied by choking, gagging, apnea, or other respiratory symptoms. Gastroesophageal reflux usually is temporary and general resolves, but can be severe enough to result in failure to thrive and aspiration. Interventions include positioning; small, frequent, or thickened feedings; or drugs (metoclopramide) that enhance gastric emptying and occasionally surgical correction.(Blackburn, 1995 : 45).First aid should be provided while the infant is vomiting by turning the baby's face to one side to prevent it from choking. The mother should collect samples of the vomited food, as this will be useful for doctors or nurses in the medical treatment of the child.

When the mothers give theirs correctly maternal caregiving behaviors in 2 needs to theirs premature infants. The health outcomes will be good and healthy.

3. Supportive-Educative Nursing System (SENS)

After revising related literatures, many ideas about properly preparing the mother of premature infant has been put into practice. By incorporating Bandula's concept, Somsrong Kaofai (B.E. 2541)brought about the idea of getting the mother to

recognize her self-efficacy in caring and conducting herself in a correct manner. Pornpun Keelawong (B.E. 2544) also used the idea to create an infant caring program for discharging mothers that measured the self-efficacy of the mothers at Maharaj Hospital, Chiang Mai. In addition learning theories from Briggs & Wager has been utilized by Wangruangsatid (2000) to train the mother about the knowledge and behavior of a mother in caring for her premature infant after discharge from the hospital. For this research, the researcher uses Orem's theory because the researcher feels that Orem's theory could explain clearly all of the variables. Orem stated that for a person to take care of himself/herself, he/she must be goal oriented and taken deliberate action towards such goal. There are two stages. Stage one is considering and deciding to take action. A person must know whether the action will be worthwhile and bring about the expected outcome. Therefore, to be able to take care of oneself, a person must know about the event both implicitly and explicitly. To be able to consider and then decide, a person must learn to observe, learn to evaluate the meaning, and learn to see the relationship between the meaning of the event and what must be done. In the second stage, the emphasis is placed on goal setting. Setting the right goal will dictate which activities should be performed, and it could also be used to follow up on the performance of the activities. In order for the premature infant's mother to developed proper infant care, she must have the correct knowledge and set goals that will bring about the well-being of her child. Orem, further, stated that for a person to develop dependent care agency, that person must have three levels of ability which includes foundational capabilities and dispositions, power components: enabling capabilities for self-care operation, and functional capabilities for self-care. Orem talked about the dependent care agency and compared it with self-care. This includes the ability to estimative, transitional, and productive operation. Because of the fact that a premature infant is a mother's first child, she usually does not have enough knowledge to care for it. Therefore, the only way for her to gain the ability to care for her infant is through the help of supportive-educative nursing system which is composed of four parts: guiding, supporting, creating a positive environment, and teaching. (Somjit Hanucharoenkun, B.E. 2540).

3.1 Teaching is a way to help the care-giver develop the knowledge and skills

and is one of the most important methods for improving the ability to care for the needed. Guidelines for teaching caretakers are as follows: teach about things that need to be taught, the care-giver must be ready to learn, getting involved and practicing will improve the learning speed, asking question as a form of assessment will help the care-giver to adjust his/her behavior, each person's ability to learn is the same, so the content and method must be flexible in order to create a supportive environment, and developing good relationship with the care-giver is very necessary to elevate the confident level. In 1998 Somsrong Kaofai (Somshong Kaofai, B.E. 2541) did a study about the mother's aptitude for learning before discharging. By looking at the ability to care for premature infant and the infant's behavior, it was noted that the mother who received better training preparation were better care-giver than those who did not. The study utilized the "Caring for Premature Infant Handbook." It suggested that modeling and an opportunity to actually do it enhance the success of the mother. Rungtiva Wangraungsatit also did a similar study in 2000 by using the same handbook with an addition of a voiced slide show. She discovered that those mothers that were trained right away were better at caring for their babies those who were trained one month after discharging. In addition there was a study done on preparation program for the mothers of premature infant before discharging at Maharaj Hospital, Chiang Mai by Pornpun Keelawong (B.E. 2544), which concluded that this program proved useful in real-life. The people involved felt that the information was useful and clear. They were also given an opportunity to question and were involved in by actually practicing that also include a step by step demonstration. Videotape also made it easier to understand and the participants could made use of the information with ease. The sampling group, after having finished with the training, was able to perform the majority of the chores with high standard which included breast feeding and hygienic infant care. Self-efficacy about the infant care of the post-partum mothers at the end of program was at a very high level.

Consideration about instructional media. Instructional media is anything that could be used as a medium by the instructor to effectively transfer ideas or concept to the participant. These include materials, equipments and the means of transferring. Health instructional media is something that the instructor makes use of as a medium for conveying thoughts about health to the participant. This is performed to change

behavior of the participant about health, from not knowing at all to knowing something, from knowing a little to a lot, or from incorrect behavior to correct. Because different types of media have their own attributes, suitable media must be chosen on the basis of objective, subject matter, procedure, the participant, and the learning environment (Pornpun Keelawong, B.E. 2544).As mention earlier, preparing the mother with use of media such as slides, pictures, tapes, films, and videos do have their limits because it is considered one-way communication. The participant could not get any direct feedback. Then when the speakers are better prepared, computers have been put to use in education, business, and also in science and technology. Students in other countries have taken a keen interest in using computers to teach in what is called computer Assisted Instruction, and this is now becoming accepted as a very effective tool for teaching. This is due to the fact that computers are efficient, fast, most importantly it is a type of media that enables participant to respond. This form of media creates a very productive learning environment that helps to drive the participant to learn (Trirong Pimpa, B.E. 2537). (Sureeruk Achalapong, B.E. 2543).

After looking over a research done on the use of computer-assisted instruction in teaching by Aphiradee Khumgnean (B.E. 2542) who studied about effectively creating computer-assisted instruction for nurses with regards to urinary cathetering and , taking care of patients who receive retaining urinary cathetering. From studying the result concerning the use of computers to help teach nursing students about isolated precaution , it was found that the use of computers had proven very helpful to nursing students about separating patients and was a good way of adding on other knowledge to nursing students about infection control (Sureeruk Achalapong, B.E. 2543). The results studied by Nongkran Ruangjitt (1999: 187) revealed significant differences in the injection practice readiness of nursing students after receiving the CAI-AIM (computer assisted instruction for administering injection medications) tutorial teaching between, before and after receiving the tutorial teaching. The overall injection practice readiness dimension of nursing students in the group receiving tutorial teaching by the CAI-AIM and the teacher with CAI-AIM were significantly higher than tutorial by instructor. The CAI program for developing self-care in adolescent patients with diabetes was developed by Heran, et.al (1990 cited in Peterson, 1996: 187). The results showed that the experimental group had statistically

and clinically significant improvement in blood glucose levels prior to lunch and dinner and improvement in frequency of blood glucose testing. According to study of Choltira Arayavongwal (B.E. 2541) who develop a computer assisted instruction lesson on introduction to computer for training the Government Saving Bank personels. The purpose of this research was to compare the learning achievement of the Government Saving Bank personels who were trained by using computer assisted instruction and by traditional training, on the topic of "Introduction to Computer". The result was found that learning achievement of the experimental group was statistically significant higher than that of the control group. Neonatal Care Unit of Maharaj Hospital, Chiang Mai has developed a computer program to help prepare mothers of premature infants before discharging from the hospital. One of the advantages is the fact that they already have computers in the ward, so it is easy to keep a lot of information about everything that has to do with premature infants. These include the physical shape of the infant, the growth and development of premature infant, daily care of the infant, problems that arise from taking care of the infant, setting up the right environment for the infant, symptoms that require medical attention, vaccination, supplementation, regular check-up, prescribing medication, and answering questions about problems often found with mothers of premature infants. With the use of computers, presentation could be done with colored still pictures and also moving pictures with narration in parts where explanations are necessary and with certain activities such as giving the infant a bath, picking up the infant, arranging sleeping position for the infant, and breast feeding. There are three ways of giving information: one on one, group, and community. Each type has its own objectives, conditions, and reasons. In this research, however, the researcher has chosen the one on one approach where teaching is done directly between the teacher and the student which has many good points: student could really learn and understand the information, problems could be analyzed on a one on one basis, the student would get ample opportunity to ask questions, and able to get the student to do what is required. Teaching on the one on one basis could be tailored made specifically according to ability, interest, and the student's needs. Keeping in mind the differences between people in ability, talent, interest, physical requirement, emotion, and social class, the researcher, therefore, chose the one on one approach. In addition, with the use of

computers, the mother could look over and over at the information in order to have better understanding. By arranging for the mother to actually practice on her infant, the mother could gain more confident in taking care of her infant which goes according to a study done by Costello & Chapman (1998: 37-42). According to the study, the mother who was allowed to spend time with her infant actually learned more about premature infant care and also had a better understanding about premature infant's behavior which ensured that mother would have the confidence and ability to care for her infant after discharge.

3.2 Guiding is very helpful and suitable in the case where the mother could choose to look after herself under counseling with regular check-ups. The nurse and the mother would have to keep in touch. The nurse often uses counseling and supportive system when the infant return home during the first week because this is considered a crucial time. During this time the father and mother would have take care of the infant by themselves which could have an impact in the long-term on the infant and the family. The parents who haven't been prepared for the tasks to come with regards to the care of the infant will have problems making adjustment from inexperience which often lead to stress and anxiety (Mckim, 1993: 89-96). From study by Jutarat Mesukko (B.E. 2540), it was noted that mothers of premature infants do need support in the form of regular visit from the nursing staff because of their needs for reassurance to have more confident in taking care of their infants. This finding agrees with that of the study done by Mckim in 1993 which stated that premature infants' mothers do need regular visits from community nurses to help with information and support during the first week after discharge. Mckim , et al.(1995: 184-193)also found that regular visits at the beginning, guiding, and following up by phone had a positive effect on the mothers of premature infants and helped the mothers made adjustment react reduce the re-hospitalization rate (Gorrie, Mckinney, & Murray, 1998:615 ; Johnson, Brennan, & Flynn-Tymkow, 1999:480-485). Home visit also provide opportunities to identify both barriers for reaching family health promotion goals such as approve the health outcome of the baby. The advantage of home visits includes convenience for the mother, the mother control of the setting, the ability to individualize services, a natural, relaxed environment for the discussion of concern and needs. (Stanhope, & Lancaster, (2002: 306). Telephone

consultation provides opportunities for the mothers to ask the nurses when real problems arise, and the service should be provided 24 hours a day in response to the needs of the mothers. The topics that are often asked about by the mothers include feeding, breast feeding, general care, and this is also an opportunity to evaluate other problems. The evaluation is performed by getting the nurse to call back after given advice to see whether the problem is being handled correctly. The nurses in charge should study up on counseling techniques in order to provide good quality consultation that caters to the needs of the mothers (Gorrie, McKinney, & Murray, 1998: 619). Studies done in other countries found that personal visits to the home of first time mother help reduce the fatality rate of the infant thereby improving the health of both the mother and the infant and reduce expenses (Schiff, 2001: 16). Re-hospitalization rate is also reduced, and the mothers are also very happy about having professional people looking in on them (Johnson, Brennan, & Flynn-Tymkow, 1999: 615). Therefore, telephone guiding and personal visits are very important during the first week after discharge (Elliott, & Reimer, 1998: 41-45).

3.3 Supporting is a way of encouraging the patient or the person receiving the service to administer self-care. Support may include verbal or non-verbal communication performed by the nurses such as eye contact, touch, or physically help the person. Support also includes creating the environment where the participant could develop self-care which in this research during telephone guiding or personal visits, the researcher would provide support by using words of encouragement, perform actions that would be perceived as sympathetic towards the mother of premature infant.

3.4 Managing environment conditions are the way of inspiring the participant to move in the right direction. Changing incorrect or inappropriate behaviors is a way of getting the right result. An environment that fosters development usually promotes learning as well. This form of support is usually used in conjunction with other forms such as teaching. A study by Pornpun Keelawong (B.E. 2544) suggests that brochures or pamphlets should be provided for the mothers, so they could go over the information as often as needed. A study by Mckim (1993: 89-96) also found that the mothers do need books that have information about premature infant care. Saad Mungsin (B.E. 2537) did a comparison between knowledge and performance before

and after using premature infant care for the mothers' handbook in the municipality area of Chiang Mai and found that the sampling group with proper knowledge do perform better. The researcher, therefore, came up with the idea of a handbook for premature infant care and distributed them to the mothers before discharge, so they could revise and use it as an information base when problems arise. In addition, the mothers could also look over the information as often as needed (Kidnanun Malithong, B.E. 2531). The researcher prepared the premature infant care section for the mothers to practice their infant care.

After going over the research the brought about the idea of a supportive educative nursing system by Nongnuch Vitayachokkitikul (B.E. 2536). that studied the result of a supportive educative nursing system, providing practical information, the satisfaction in using breast feeding to bring up an infant, the closeness in between a mother and her child with the use of teaching techniques, environmental management, breast feeding handbook, supporting plan, and providing information about using breast feeding to bring up a child. The study found that the score for the group that received the supportive educative nursing system was much higher than those who did not. Another study done by Suwanobol (2000) about the feeling of anxiety with regards to the ability to take care of the infant and the development of premature infant with the use of the supportive educative nursing system and the Premature Infant Care Handbook found that after comparing the two groups, the group that received the training had a lower anxiety score, had a higher capability score 4-6 weeks after giving birth, and had a better premature infant development score.

All the above studies support Orem's theory which suggests the use of a supportive-educative nursing system a mean to prepare the mother in caring for her premature infant. Therefore in this research, the researcher uses the supportive-educative nursing system that includes: 1.) Teaching provides the mother with the knowledge and understanding, so that she would be able to perform self-care at home. The researcher provided computer assisted instruction (CAI) named "The Premature Infant Care for The Premature Infants' Mothers". They could using CAI as they needed. In addition she also got involved in problem-solving situations and received practical training before discharge. 2.) Guiding is a good way to help premature

infants' mothers who are decisive and are able to choose and perform the activity under the direction and suggestion of the nurses. In addition, the researcher arranges help for first time mothers after discharge in the form of a 24-hour hotline in order to boost the confident level, so they could take care of their premature infants. This is followed up by personal visits one week after discharge to give advice about problems and provide support to make sure that confidence level remains high. 3.) A fostering environment is created by preparing the premature infant care section for the mothers to practice their infant care and providing the premature infant's mother with the Caring for Premature Infant Handbook on the day of discharge. When the mother is provided with various forms of supportive strategies, the mother could provide the right kind of behavior for her infant which leads to better health for the infant as well.

4. Factors Influencing to Premature Infant Care of the Mothers

Otherwise, the others factors influence to the maternal caregiving behaviors as follows.

4.1 Age is a factor in determining the aptitude of the mother concerning the management of issues and problems that occur. The development of the state of mind, perception, understanding, and decision making ability of individual increase with age, peaking at adulthood and decreasing as the individual becomes older (Orem, 1991). A study done by Jones and Company (Jones, et al., 1980:579-584) stated that teenage mothers usually lack the necessary skills to become a mother. When looking at behaviors such picking up and touching the infant, mothers who were under the age of 19 did it less often than mothers over the age of 19.

4.2 Educational level of the mother is also an important factor. A more educated person could understand and learn things faster than someone who is not as well-educated. With regards to premature infant's mother, a mother must learn about the different between special care and format and infant development planning. Therefore, a mother who is more educated would be able to learn faster which enables the mother to respond to the needs of the infant. A study by Nidda Chokboonyasak (B.E. 2530) found that mothers with higher education are better at stepping into motherhood than mothers with lower education. Another study by Suwanee Srijanarpa (B.E. 2527) found that parents who graduated from university level are

more prepared for parenthood than parents who graduated from high school and primary school respectively.

4.3 Number of children in the family is another factor. If the parents only have one child, they will pour their hearts into caring and be extra careful about their infant. The first and last child are also important to the family which leaves the middle child who is usually being neglected and receives less attention than the other two (Boonyawadee Petcharat, B.E. 2530 in Wandee Chaisap, B.E. 2540). A study performed by Wandee Chaisap found that the ranking of the infant has a negative effect on the relationship between the mother and her premature infant.

4.4 The mother's occupation also plays an important part. Working mothers who are also responsible for the family are having difficult time with infant care because they do not have the time or motivation to follow up on news about the progress and development of self-improvement and self-care. Junya Suwanatud (B.E. 2534) did a study on mothers of infants under 12 months of age with respiratory infection found that mothers with different occupation have different self-care behaviors. But another study by Angkana Jirajin (B.E. 2530) about mothers of infants with or without respiratory infection found that working mothers or non-working mothers have no bearing on self-care. They might do it well or they might not (Prakrit Ruchawat, B.E.2536).

4.5 Family income. Income is an important factor which allows parents to have the means to look for useful items and provide more for their infants. These also include the basic necessity of everyday life. A study by Supatra Towan (B.E. 2531) found that the knowledge, attitude, caring behavior of mothers with income over 3000 Baht per are much better than mothers with lower income.

4.6 Family Characteristic. The family is a form of social institution that is the most helpful in providing support. A family with many members or an extended family has better opportunity to inspire and support the mother than a family with only the husband and child or single family. This is especially true in first time mother (who is a member of the family) with responsibility to accommodate physical and emotional needs, loving and support for members of the family (Ruja Phoopaiboon, B.E. 2543: 6-7). From a study by Choosri Teawsakul (B.E.2540), it was found that family characteristic is not related to the mothers' self-care behavior of

infants under 12 months old who came to receive treatment at Vachira Hospital, Phuket.

4.7 Child care experience. Prior experience is a factor that enables a person to learn and adapt. A person with experience or been in the same or similar situation is able to learn about something about a new situation faster than someone with no prior experience.

All the above factors may have an effect on premature infant care behavior of the mother. To have proper infant care behavior, premature infants' mothers need to be prepared so that they could perform dependent care once return home. As the mothers do not have prior experience in premature infant care, they may have some problems because premature infants usually have health problems and progress and development that differ from regular infant.

In order to cater for the needs of premature infants' mothers, the researcher has provided the supportive-educative nursing system for the premature infants' mothers to prepare them before discharge so that they would have more confident in taking care of their infants, reduce anxiety, have the proper behavior which in the end leads to healthier infants and decrease re-hospitalization rate.

Conclusion

After going over the literature, it can be concluded that premature infants are at risk from many problems and therefore require special caregiving demands. Because the premature infant's mother is the one responsible for caring, she needs to have the correct caring behavior to promote the well-being of her infant. But for lack of experience in caring for premature infant, the mother does not have enough information and confident to take care of her infant. This is where the supportive-educative nursing system fits in to the picture. It provides the necessary information and prepares the mother for dependent care after discharge. There are three steps which include teaching, guiding, supporting and creating a supportive environment. 1.) Teaching provides the mother with the knowledge and understanding about premature infant care so that when the mother returns home she could administer self-care. The teaching is done with the use of the CAI for the mothers before discharge, study about problems and learning to solve them, and practice actual infant care

before discharge. 2.) Guiding is a good approach for the mother that could decide about the means and activities of premature infant care under the direction and supervision of the nurse. Supporting is promoting and maintaining the mother's effort on the performance of premature infant care activity by creating relationships between the nurse, the mother, the family, and by enhancing morale with touching, words, and sympathetic expressions. This will fill the mother with belief and trust which will improve the quality of premature infant care. The telephone advice is set up to provide all the necessary information with the addition of home visits one week after discharge to look in on the mother and offer support. This is the type of support that promotes the confident level of the mother. 3.) Creating a supportive environment is an integral part of the learning and is done through the use of the Caring for Premature Infant Handbook. The researcher prepared the premature infant care section for the mothers. The handbook is given to the mother on the day of discharge. What the researcher hopes to see is an improvement in premature infant care, better health, and a decrease in re-hospitalization rate.

CHAPTER III

MATERIAL AND METHODS

The design of this research is a quasi – experimental study, two groups were used to determine the maternal caregiving behavior of premature infant's mother and the health outcome of premature infant one month after discharge between premature infant's mothers who received the supportive – educative nursing system (SENS) and usual nursing care.

Population and Sampling

The population parameters of this quasi – experimental research study are the mothers and their premature infants. The samples had been selected from mothers who visited their infants and scheduled to be discharged.

The inclusion criteria of premature infant mothers are:

1. The mother who has her first premature infant at less than 37 weeks of gestation age.
2. The mother is the primary care-giver who takes care of the baby after hospital discharge.
3. The willingness to be a subject of the experiment.

The inclusion criteria of premature infants are:

1. The gestation age of the premature infant is less than 37 weeks with an apgar of over 7.
2. After the diagnosis, the infants are in good health. There are no problem with sucking and swallowing, no congenital and endocrine disease exhibit by any of the infant.
3. At discharge, the post-conceptional age of premature infant is between 37–40 weeks.
4. The premature infant weighs more than 2,000 grams at hospital discharge.

The exclusion criteria is:

1. The mother can not take care her infant all time of this study.

The researcher controlled the biological factors (hereditary, sex, food, performance of various glands and health); psychological and emotional factors by selecting the premature infants from parents of Thai race infants under the same nursing care, selection proximate number of male and female infants in the controlled and the experimental groups, selecting the premature infants whose not use any problems of endocrine, selected the sample groups from mothers of premature infants without complication, not admitted at Neonatal Intensive Care Unit (NICU), and with gestation age and body weight in proximity to each other. In case of the psychological and emotional factors , the researcher can not control these factor that it is the limitation of this study. Therefore the Neonatal Care Unit has not the policy to allowing the mother to live with their baby.

Sampling Technique

Forty samples had been selected by using a purposive method. They were divided into 2 groups: the control group received only the usual nursing care and the experimental group received both the usual care and the additional supportive – educative nursing system (SENS). They were 20 cases for each group. The data collection had started with the control group before continuing on with the experimental group. This design was chosen to prevent contamination of intervention, to avoid feeling of unequal or unfair comparison being induced by the intervention of the control group.

Sample size

The sample size was selected using the principle of Polit & Hungler (1983:426-427). It suggested that an experimental research should consist of at least 20-30 cases. In the case of comparison between groups, the number of samples in each group should be more than 10 cases, depending on the number of variables. In this study, the sampling size was 40 cases but was divided equally into two groups: control and experimental groups, 20 cases per group.

Research setting

This study was conducted at Neonatal Care Unit of Maharaj Nakorn Chiang Mai Hospital. The Characteristics of the setting are as follows:

The neonatal care unit of Maharaj Nakorn Chiang Mai is the place where medical students, nursing students and specialists use for studying. It has 20 beds for patients and visiting time is 11.00 am - 1.00 pm and 3.00 pm - 7.00 pm. One week before discharge, the premature mothers were given the usual nursing care: information of the discharged plan, premature infant care advising, practice infant care activity which the mother cannot do or (having) low self-confidence. They didn't have the handbook but had received the premature infant care brochure that was created by the nursing health education of pediatric department (2541-2543). The contents of the brochure are as follows: breast feeding, neonatal infection, hyperbilirubin, common problems and daily care. This brochure is black and white with no images. The nurses will give the brochure only when the premature mothers mention their need. At discharge, the premature mothers will receive the newborn health handbook that was developed by the health care team of Maharaj Nakorn Chiang Mai Hospital. After discharge, when the premature mothers have some problems about the premature infant care, they would contact the nursery nurse by phone for the advice: the nurses will give their individual opinion. The Maharaj Nakorn Chiang Mai Hospital doesn't have the standard advice of premature infant care for the mothers.

The high risk clinic is the place where the child and infant receive the check-up by the neonatologist. The infant check-up are as follows; weight, length and occipito-frontal circumference measuring and check up by the neonatologist. The high risk clinic provides services on Tuesday between 8.00 am to 4.00 pm.

The residents of the samples are far from Maharaj Nakorn Chiang Mai Hospital around 50 kilometers.

Instruments

The instruments used in this study composed of 2 parts:

1. Data Collection Instruments

1.1 The questionnaire of premature infant's and mother's demographic data (Appendix E in Part I). It was developed by the researcher. The questionnaire consists of 2 parts: the first part was used to obtain the same basic personal data of the mothers themselves: the second part was used to obtain the basic personal data of the

premature infants that would be reduced by the researcher at discharge date.

1.2 Maternal caregiving behavior questionnaire (Appendix E in Part II).

It was developed by the researcher. The researcher developed the questionnaire using the concept of therapeutic self care demand (Orem, 1995), bonding attachment (Klaus, & Kennell, 1982) and developmental care (Blackburn, 1995). This questionnaire measures maternal caregiving behavior. It consists of 19 questions which could be categorized into 2 parts:

Part one (Questions 1 to- 11, 15 to- 16) is about universal self-care requisites.

Part two (Questions 12 to- 14 and 17 to- 19) is about developmental self-care requisites.

Validity

The questionnaire was assessed for content validity, language, suitability, illustrations, and the criteria of measurement by the researcher's advisors and six experts in the relevant fields (Appendix F) : two pediatrics nursing instructors with expertise in neonatal care, one nursing instructor with expertise in family care, one nursing instructor with expertise in developing tool for nursing research, one clinical nurse specialist in neonatal care unit, and one neonatologist. The Content Validity Index was .88. All suggestions from the experts were contributed to the refinement of the instrument.

$$\text{Content Validity Index} = \frac{\text{Numbers of similarity comment in the question}}{\text{Total questions}}$$

(Benfield, 1992: 194-196)

Reliability

The questionnaire was tested on 10 premature infants' mothers who had characteristics similar to those of the sample before data collection began. The data was calculated for the reliability test with Cronbach's alpha which came out to be .82

Part one consists of the questionnaire about maternal caregiving behaviors on premature infant care. It was assessed according to the frequency of the events that occurred in everyday life. There are a total of 14 questions which would be classified into 4 levels as follows :

- Regular, means that the mother has followed up the stated practices every time the event has occurred.

- Frequently, means that the mother has followed up the stated practices 2 out of 3 times when the event has occurred.

- Rarely, means that the mother has followed up the stated practices 1 out of 3 times when the event has occurred.

- Not at all, means that the mother hasn't followed up any of the stated practices at all.

Part two consists of the questionnaire about maternal caregiving behaviors on premature infant care. It was assessed according to the number of days that the events occurred in one month after hospital discharge. There are a total of 5 questions which would be classified into 4 levels as follows:

- Everyday, means that the mother has followed up the stated practices everyday in a month after discharge.

- 20-29 days in a month, means that the mother has followed up the stated practices only 20-29 days in a month after discharge.

- 1-19 days in a month, means that the mother has followed up the stated practices 1-19 days in a month after discharge.

- Not at all, means that the mother hasn't followed up any of the stated practices at all.

The respondents were to choose only one answer. A positive answer means the right practiced while a negative answer means the wrong practices. There are 15 questions with positive answers which are question number 1-6, 8-10, 12-14, and 16-18. There are 4 negative answers which are question numbers 7, 15-16 and 19.

Here are the criteria for scoring:

Part one

	Positive statement	Negative statement
- Regularly	4	1
- Frequently	3	2
- Rarely	2	3
- Not at all	1	4

Part two

	Positive statement	Negative statement
- Everyday	4	1
- 20-29 days in a month	3	2
- 1-19 days in a month	2	3
- Not at all	1	4

The score of the maternal caregiving behavior on premature infant care represents the highest and the lowest scores from 19 to 76, respectively. The criteria show that the higher score the respondent gets; the more correct behavior of infant care the respondent possesses.

1.3 The record form of health outcome of a premature infant after hospital discharge (Appendix C in Part I and II). It was developed by the researcher. It was used to evaluate the health outcome of premature infant after hospital discharge. It covers these following topics:

- The weight of the baby (grams) has been evaluated one month after discharge. The baby was weighed using the infant-weighing scale. The increase in weight of a premature infant at 15 g / kg / d is a normal rate (Klaus, & Fannarolf, 1993: 158).

- Length (centimeters) and head circumference (centimeters) of the baby has been evaluated one month after discharge. The baby would be measured using the pedobaby which is made of plastic and the scales read in inches and centimeters. The increase in length of a premature infant at 1 centimeters / week is a normal rate (Klaus, & Fannarolf, 1993: 159). The increase in head circumference of a premature infant between 0.5 - 1 centimeters / week is a normal rate (Klaus, & Fannarolf, 1993: 159).

In this study the researcher used these instruments for assessing the infant's growth through out the research.

- Premature infant illness after hospital discharge referred to the sickness and abnormalities of premature infant after hospital discharge. It was evaluated using the mother's knowledge. History of illnesses is divided into three parts: illness, time

of illness and maternal first aid.

- The evaluation of the baby's sickness, and the first aid assistance was provided by the mother focusing on conjunctivitis, thrush, abdominal distention, constipation, diarrhea, diaper rash, vomiting, and fever.

The criteria for evaluation would be focused on the frequency of illness in each case and, the mother's first aid and assistance provided. High frequency of illness in each case means that the premature infant health is not well. Below are the correct practices which have been considered:

Conjunctivitis. First aid procedure is to soak the absorbent cotton in cold boiled water and clean the eyes, starting from the inlet to the outlet of the eyes. Cleaning back and forth is not allowed. If this symptom persists after one day, the baby needs to be taken to the doctor.

Thrush. First aid procedure is to soak the cloth in cold boiled water and clean the thrush area. Alternatively, the baby needs to be taken to the doctor.

Abdominal distention. First aid procedure is to make the infant belch. The baby should be held by the shoulder. Then, gently touch the baby's back upward and downward, or tap or hold the baby in the position which allows the baby to belch forward and gently touch the back. If the condition has not improved in 12 hours, the baby needs to be taken to the doctor.

Constipation. First aid procedure is to feed more breast milk to the baby. In case of the formula feeding, try to change new formula milk. Not to use glycerin or soap suppo.

Diarrhea. First aid procedure is to continue breast-feeding as usual but to focus on cleaning the mother's hands and nipple. In case of the formula feeding, mixed boiled water into the milk to dilute the concentration by half.

Vomiting. First aid procedure is to turn the baby's face to one side to prevent it from choking. If it occurred several times, take the baby to see the doctor.

Diaper rash. First aid procedure is to keep the diaper area clean and dry. The mothers should change diapers as soon as they are wet or soiled and gently wash the perineum with mild soap and warm water, then rinse and dry well.

Fever. First aid procedure is to soak the cloth in warm boiled water for decrease temperature. If the temperature is not cold down, then take the baby to the doctor.

Validity

The record form has been assessed for content validity and language by the researcher's advisor and six experts in the relevant field, two pediatric nursing instructors with expertise in neonatal care, one nursing instructor with expertise in family care, one nursing instructor with expertise in developing tool for nursing research, one clinical nurse specialist in neonatal care unit, and one neonatologist. All suggestions from the experts have been contributed to the refinement of the instrument.

2. The Instruments use in the research procedure includes:

2.1 Computer-Assisted Instruction (CAI) is named “Premature infant care for mother”. The development was based on the storyboard design that had been developed by Patcharee Vorakitpoonpol who is a nursing instructor in the faculty of nursing, Chiang Mai University, the researcher and two clinical nurses specialist at Maharaj Nakorn Chiang Mai Hospital (2003). The CAI program is designed to be used as a tutorial lesson and is divided into 4 sections. Section I: knowledge of premature infant (meaning, characteristic, behavior), section II: daily care of premature infant, section II: first aid care for common problems, and section IV: test of knowledge in premature infant care. The CAI program was developed by the CAI computer programmer using Autoplay Media Studio 4.0 running on Window operation. This software has many good features that facilitate instructions. These features incorporate test, graphic, animation, pictures, and sound (Appendix C in Part I). The researcher controlled the CAI process as follows: when a premature infant's mother clicks on the coverpage to start the CAI, the mother must register the name to participate in the CAI program thereby forcing the mothers to try the pretest questionnaire. On the main menu page, the mother could jump one menu to another by clicking on the hyperlink for content or using the next button to view the content page by page. The CAI program was designed to record the user participation, the score of the pre-test, the post- test, the pages open, all keys press, and all mouse click

to the XML data base file. This study selected the premature infants' mothers who completed the CAI program.

Validity

The instructional plan of CAI and the test for knowledge of premature mothers were assessed for content validity and language suitability by 4 experts in the relevant fields: one nursing instructor with expertise in neonatal care, one clinical nurse specialist in neonatal care unit, neonatologist, and one programmer. The suggestions from the experts were contributed to the refinement of the instrument. Moreover, the material of CD-ROM was assessed for lesson design which consists of: the story board design, flowchart design, and screen design. There are 3 experts with considerably experience in CAI. This instrument was revised by these experts.

Try out

The CAI program was tried out on 3 premature infant's mothers who visited their baby at neonatal care unit. By instructing the mothers to go through the program, observe for good understanding of the contents, and observe for good command of CAI program usage. When the observer finds unclear directions, missing connected points, and other problems from the presentation CAI program, the program was also evaluated. Information from the evaluation of 3 premature infants' mothers by interviews have been used to perform a reversion of the CAI program. The reversion of CAI program will be completed when it is error free.

Evaluation

The evaluation of the efficiency of computer-assisted instruction program was evaluated by using the efficiency criteria of KW-CAI (Watthananarong, K, 1995 cited in Prasarnsoi, 2001: 43). The scores of knowledge test in the lesson and post test score of premature infant care were analyzed to identify the efficiency of the computer-assisted instruction program (E-CAI) by using the efficiency criteria of KW-CAI (Table 18 in Appendix A)

The statistic method was shown as follow:

$$E-CAI = \left[\frac{\bar{E}a + \bar{E}b}{2} \right] \times 100 \text{ or } E-CAI = 50 (\bar{E}a + \bar{E}b)$$

$\bar{E}a$ = Mean of the proportion of scores of knowledge pre-test in the lesson

$\bar{E}b$ = Mean of the proportion of scores of knowledge post-test in the lesson

Table 18 shows that the lesson mean scores of the CAI lesson was 83.5 [(E-CAI = $50 \times (.79 + .88)$]. The efficiency of CAI lesson was categorized as a “fair” level (80-89%) (Prasarnsoi, 2001: 43). These results indicated that this CAI program was efficient to be used in the premature infant’s mother.

2.2 The premature infant caregiving handbook. The handbook was developed by the researcher. Its content is not different from the CAI contents. The handbook composes of clothing preparation, home environment, sleep, excretion, bonding and attachment, preventing infection, abnormal signs and symptoms, common health problem and first aid follow up after discharge, growth and development, vaccination, medication, accidental prevention and the history of illness record form (Appendix C in Part II).

Validity

The appropriation of the content, meaning and the illustration were verified by six experts (two nursing instructors with expertise in neonatal care, one nursing instructor with expertise in families care, one nursing instructor with expertise in developing tool of nursing research, one clinical nurse specialist in neonatal care unit, and one neonatologist) (Appendix F). This instrument was revised with the suggestions of the experts.

Try out

The premature infant caregiving handbook was tried out on 3 premature infants’ mothers whose characteristic were similar to those of the sample at Nakorn Ping Chiang Mai Hospital. The content of this instrument was revised from the evaluation of these 3 mothers by the interviewer. It was completed when all problems and errors in the contents had been solved.

2.3 Telephone advising guideline concerning the care of premature infant. It was developed by the researcher. It contains telephone advising guideline for premature infant care which could be used when the mothers phoned in. It covers these following topics: growth and development, behaviors (sleep-wake pattern, cry, feeding and attachment), vaccination, medication, common problems (fever, conjunctivitis, abdominal distension, diarrhea, constipation, vomiting, diaper rash,

thrush), and abnormal signs. Moreover, this guideline covers first aid procedure for each topic (Appendix C in part III).

Validity

The researcher presented the guideline to the same experts who validated instruments number 2.1 and 2.2 and revised it with suggestions from the experts.

2.4 Growth measured instruments. The body weight instrument is a digital measurement tool with a scaling system for infant's body and pedobaby. The reading scale is in inches and centimeters. The length of the instrument is made of plastic material. All instruments had already passed the standard checking for use with the newborn unit, and in this study the researcher used these instruments for assessing the infant's growth through out the research.

The data collection was conducted by the researcher and with the help of a research assistant.

The researcher activity

1. The researcher screens the subjects from the Neonatal Care Unit.
2. Collecting data and assessed as follows :

2.1 Record the demographic data of premature infant mothers and premature infants. In the case of premature infants' mothers, they answered the questionnaires by themselves, but the demographic data of premature infant, the researcher recorded the data from history.

2.2 At discharge, the researcher weighed the baby, measured length and head circumference before discharge.

3. Administering the Supportive-Educative Nursing System to the experimental group as follows: teaching, guiding, supporting and managing environmental conditions. The researcher did home-visited the experimental group one week after discharge and gave advice and support when the mother had premature infant care problems and others problems.

The research assistant activity

1. Assessed health outcome of premature infant as follows: weighing 3

times and choose 2 out of 3 with the same outcome for reliability of measurement, measured length and head circumference, recorded the history of illness of the premature infant one month after hospital discharge and physical check up at high-risk clinic for both group. It is a blind study where the research assistant did not know which sample is in the control group or in the experimental group.

2. Assessed maternal caregiving behavior by using questionnaire.

The research assistant preparation

This study uses one research assistant who is the registered nurse at high-risk clinic, Pediatric-Out Patient Department. She has had an experience in neonatal nursing more than 15 years. The researcher instructed her assistant to read along with her as she performs data collection. When collecting data, the assistant is the person who collected health outcome form and maternal caregiving behavior on premature infant care questionnaire at one month after discharge. The assistant is able to accurately answer questions of the sampling group in relation to the questionnaire. Additionally, the inter-rater reliability for the measured and assessment variable case by case between the researcher and the assistant was conducted with five premature infants' mothers and theirs babies. The inter-rater reliability was 1.0.

Data Collection

The permitted form to conduct the research was performed by submitting the documents from the Faculty of Graduate Studies, Mahidol University, to the director of Maharaj Nakorn Chiang Mai Hospital, the chairman of Pediatric Department, the co-director of Nursing Department, and the head nurse of Neonatal Care Unit, the head nurse of High-Risk Clinic, Pediatric Out-Patient Department of this hospital. Then, the data collection was performed as follows:

1. The researcher cooperated with Neonatal Care Unit 4 and 3 in order to know the schedule of premature infants' discharge, lists of infants and the history of the premature infants will be reviewed by the inclusion criteria and included in this study. When the criteria were met, cases were approached. The researcher provided information with regards to the study to prospective sample and asked for their consent to participate in the study. In order to prevent the problem of contamination between subjects in the control and the experimental groups, the researcher decided to

conduct the study with the control group before continuing on with the experimental group. The first 20 dyads (20 mothers and 20 premature infants) who volunteer to participate in the study were assigned to the control group, while the other 20 dyads were assigned to the experimental group.

The control group received usual nursing care provided by staff nurses. Making an appointment with the physician to follow-up the patients' condition at the High-Risk Clinic , Pediatric Out-Patient Department (OPD) is included, instruction, and suggestion of the premature infant care. After hospital discharge, the mother who had some problems with premature infant care would consult the staff nurses of Neonatal Care Unit by phone. The nurses would advise them with their individual knowledge and style.

2. After completing data collection of the control group, the researcher prepared the sixteen neonatal nurses for telephone advising. The processes were as follows:

2.1 The researcher set the meeting with the neonatal nurses to describe the objectives and telephone advising guideline; the nurses were separated into 2 groups (8 people / group). It took 4 hours for each group. The telephone advising guideline was based on the support-educative nursing system (SENS).

2.2 The researcher and the neonatal nurses discussed the telephone advising guideline and then commented to the two groups of neonatal nursing to assure that the styles and techniques of advises were similar.

3. For the experimental group, they received usual nursing care by nurses and the supportive-educative system by the researcher starting from the day of discharge planning which is about 7 to 10 days before hospital discharge.

3.1 The supportive-educative nursing system plan is as follows:

During hospitalization

Step one : Initial meeting to build up relationship.

Building relationships: is practiced with each mother individually at the neonatal care unit through self-introduction, describing the research objectives and seeking cooperation in this participation. After the mothers agreed to participate in this study, the researcher provides them with the personal data questionnaire. The researcher provided necessary information, guidance and a caring manual for the mothers of premature infant. The researcher also informed the mothers about meeting once a day

at the mother's convenient for 45 minute to find out about problems and to provide guiding, supporting and teaching.

Step two : Teaching by using the CAI program.

The researcher arranged the environmental conditions to facilitate learning by using private room to provide intervention. The program was arranged at the health education room of the Neonatal care unit, Maharaj Hospital, Chiang Mai. The mothers will receive some suggestion about how to use the computer program. Then, the mothers would study the CAI which contains knowledge about premature infant care. The entire program would go on for 40 minutes. This CAI program was designed to show the output and subject's total score after completing the knowledge test in the program. The researcher provided that the mothers repeat the program as many times as they wanted to.

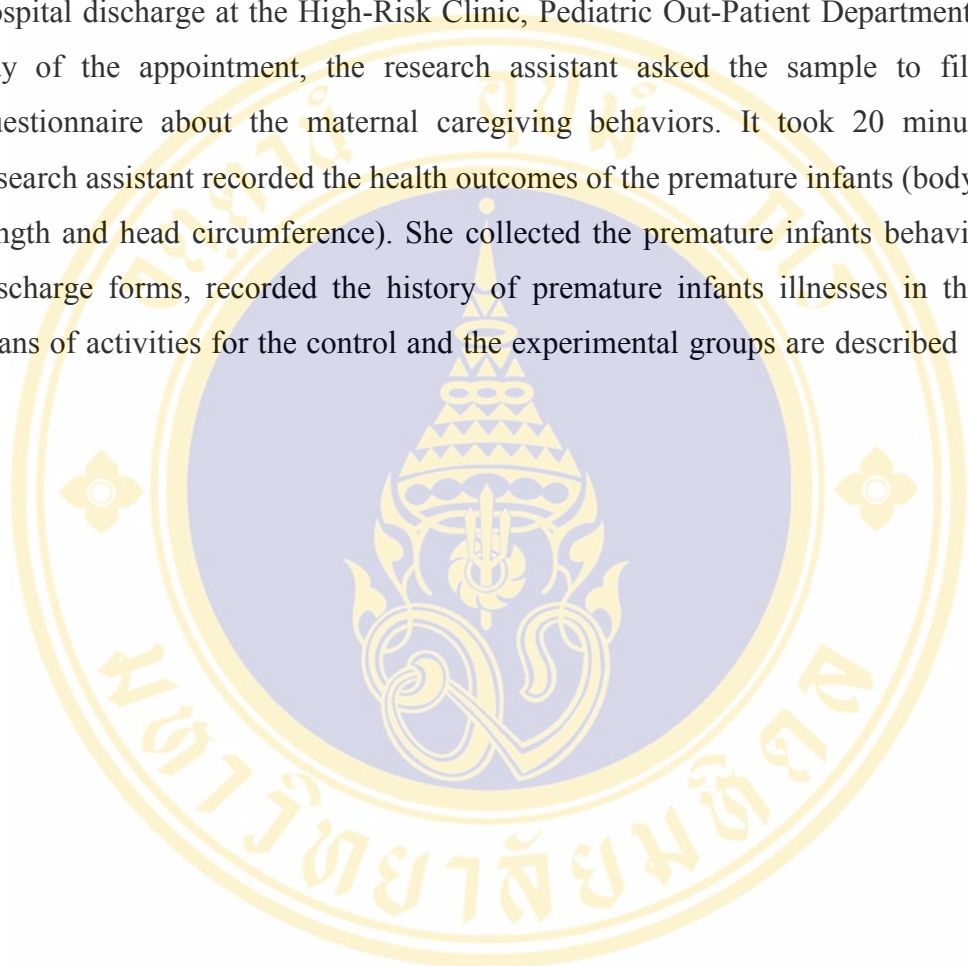
Step three: During discharge planning, the researcher and the premature infant's mother would set up appointment for meeting at the mother's convenient to provide an opportunity for the mother to practice caring for her infant and develop mother-infant relationship by performing tasks such as bathing, feeding, holding, and changing diaper. All of these activities are created solely for the benefit of the mother. When problems about premature infant care arise, the researcher would provide additional information on top of what is already on the CAI. At discharge time, the mother would also receive the premature infant care handbook to be used for revision at home. The follow-up would be schedule 1 month after hospital discharge and the venue to be informed to the sample. The date of the follow-up was recorded in the hospital identity card and handbook. The researcher weighed the baby, measured length and head circumference before discharge.

After hospital discharge

When the mothers were discharged from the hospital, the researcher visited them at their home one week after discharge, providing them with opportunities to identify both barriers for reaching premature infant health promotion goals such as approving the health outcome of the baby. Home visits are scheduled at the convenience for the mothers. The mother could control the setting, the ability to individualize services, and a naturally relaxing environment for the discussion of concern and needs. During one month after discharge, the mothers received advice and the neonatal based on the

telephone advising guideline every time they called the researcher and the neonatal nurses of the Neonatal Care Unit 3 and 4, Maharaj Nakorn Chiang Mai Hospital. The telephone advising is based on the supportive-educative nursing system.

4. The research assistant conducted the follow-up for both groups 4 weeks after hospital discharge at the High-Risk Clinic, Pediatric Out-Patient Department. On the day of the appointment, the research assistant asked the sample to fill in the questionnaire about the maternal caregiving behaviors. It took 20 minutes. The research assistant recorded the health outcomes of the premature infants (body weight, length and head circumference). She collected the premature infants behaviors after discharge forms, recorded the history of premature infants illnesses in the forms. Plans of activities for the control and the experimental groups are described in figure 2.



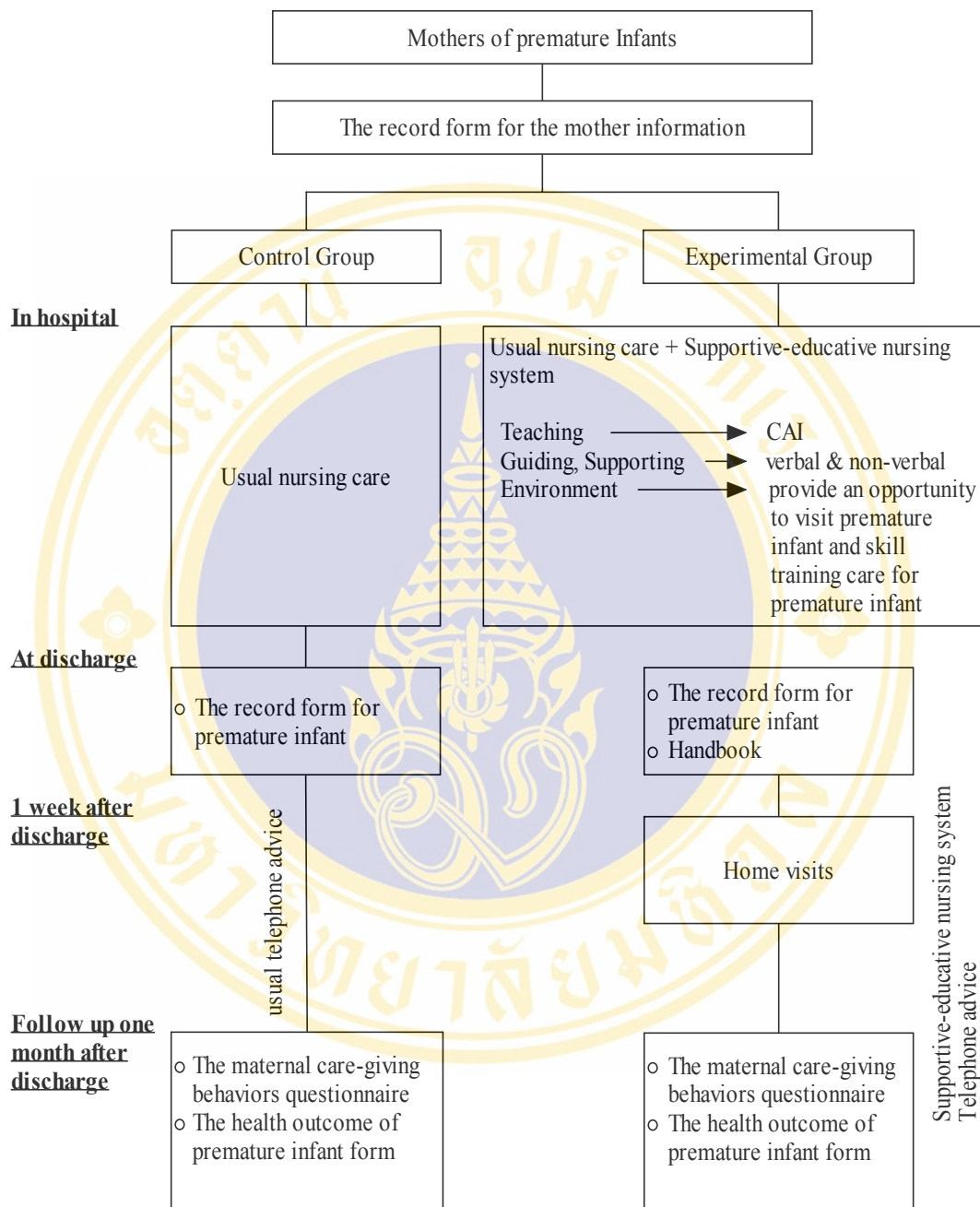


Figure 2. Plan for data collection procedure

Protection of Human Subjects

1. The researcher had undertaken the study with a permission of the Committee on Human Rights to perform research involving human subjects, Faculty of Medicine Maharaj Nakorn Chiang Mai Hospital (Appendix B).

2. The objectives of the research, and the data collection were informed to the samples before they agreed and sign up to participate in this study. The researcher explained the purpose of the study; the research process; benefits; length of time required for CAI, visiting, and completing the record forms and the questionnaire; and rights to refuse to participate in the study.

3. The subjects who agreed to participate were informed and assured that data would be kept confidential and reported only as group data. In addition, participants were informed that they could withdraw from the study at anytime. (Appendix B).

4. In the case where the researcher was met with abnormal signs of premature infants, the researcher would inform the mothers, first aid and advice the mother for proportion treatment.

Data Analysis

The researcher analyzed the data using the Statistical Package for the Social Science/for Windows) as follows:

1. The characteristics of the premature infants and their mothers were defined by frequency and percentage and compared these variables between control and experimental group by Pearson Chi-square test, Fisher's Exact test, and two-Sample Kolmogorov-Sminov test.

2. The comparison of the mean score of maternal caregiving behaviors between the experimental and the control group were analyzed by t-test.

3. The comparison of the mean of body weight change, length change, head circumference change between the experimental and control groups were analyzed by t-test.

4. The comparison of illness between the experimental and control groups were analyzed by frequency and percentage.

CHAPTER IV

RESULTS

This quasi-experimental research was conducted to determine the effects of the supportive-educative nursing system (SENS) on maternal caregiving behaviors and health outcome of premature infant after hospital discharge. In this chapter the resulting data analysis are presented as follows:

Part I: Demographic characteristics of the subjects

- 1.1. The characteristics of premature infant's mothers
- 1.2. The characteristics of premature infants

Part II: Results of hypothesis testing

- 2.1 The results of hypothesis 1
- 2.2 The results of hypothesis 2

Part I: Demographic Characteristics of the Samples

The studied sample consisted of premature infants and their mother. The subjects were recruited from Maharaj Nakorn Chiang Mai in Chiang Mai, Thailand. A total of 40 subjects were involved in this study by purposive sampling and divided into the control and the experimental groups (20 samples for each group). The data collection was gathered with the control group first, and following the experimental group. The demographic characteristics of the sample are presented in Table 4-7.

1.1 Mothers of Premature Infants' Demographics

Table 1 and 2 show the ages of premature infant's mothers ranged from 19-41 years. The mean age for control group was 27.5 years (S.D. = 5.73; range = 19-41) and 27.9 years (S.D.= 5.32; range = 19-40) for the experimental group. As for their education level, the majority of the control group had finished high school (70%), while a large number of subjects in the experimental group had finished primary school and diploma (40% and 35%). The subjects in both groups were couples (100%).

Most of the subjects in the control group had extended family(65%), whereas the experimental group was nuclear family(65%) and more than 40% of both groups had child prior care experience. The mean of monthly family income in the control group was 11,455 bath (S.D.=8943.89), while the experience group was 11,619 bath (S.D. = 8572.27), respectively. The majority of the subjects in both groups were working, accounting for 90% and 80%, respectively. The majority of workers in both groups were employed. Chi-square and t-test reveals that there was no statistical difference between those characteristics of the control and the experimental group(Table 4 and 5).

Table 4: Comparison characteristics of premature infants' mothers between the control group and the experimental group by Chi-square test.

Characteristic	Control group(n=20)		Experimental group (n=20)		P
	Frequency	Percentage (%)	Frequency	Percentage (%)	
Education level					
-Primary school	2	10	8	40	.102 ^{ns}
-High school	14	70	5	25	
- Diploma	4	20	7	35	
Occupation					
Unemployed	2	10	4	20	.708 ^{ns}
Working	18	90	16	80	
-Government employee	1	5	-	-	
-Farmer	1	5	2	10	
-Business	3	15	2	10	
-Employed	13	65	12	60	

Table 4: Comparison characteristics of premature infants' mothers between the control group and the experimental group by Chi-square test (continued).

Characteristic	Control group(n=20)		Experimental group (n=20)		p
	Frequency	Percentage (%)	Frequency	Percentage (%)	
Marital status					
-couple	20	100	20	100	1.00 ^{ns}
Birth order					
-First	14	70	11	55	.124 ^{ns}
-Second	5	25	7	35	
-Third	1	5	2	10	
Type of family					
- Nuclear	7	35	13	65	.06 ^{ns}
- Extened	13	65	7	35	
Child care experience					
-Yes	9	45	12	60	.75 ^{ns}
-No	11	55	8	40	

ns = not significance (p>.05)

Table 5: Comparison of age and family income of premature infants' mothers between the control group and the experimental group by t - test.

Characteristic	Control group (n=20)			Experimental group(n=20)			t
	Min-max	Mean	S.D.	Min-max	Mean	S.D.	
Age (years old)	19-41	27.50	5.73	19-40	27.90	5.32	.23 ^{ns}
Family income (baht/month)	3,000-35,000	11,455	8943.89	3,000-35,000	11,619	8572.27	.06 ^{ns}

ns= not significance (p>.05)

1.2 Premature Infants' Demographic

Table 6 and 7 show the majority of gestational ages of premature infants were more than 30 weeks. The mean of gestational age of the subjects for both groups were 33.75 weeks (S.D. = 1.80) and 33 weeks (S.D.= 2.66), respectively. Sex of the subjects in both group had a similar distribution. The mean of birth weight in control group was 1945.50 grams (S.D. = 570.09), whereas the experimental group was 1750.50 grams (S.D. = 565.44). The mean of post-conceptional age of the subjects for both group were 37.35 weeks (S.D. = 1.42) and 37.50 weeks (S.D. = 1.57), respectively. At hospital discharge, the mean of body weight of subjects in the control group was 2349 grams (S.D. = 324.90), whereas the experimental group was 2262.50 grams (S.D. = 296.98). Length of subjects in the control group was 44.96 centimeters (S.D. = 1.75), whereas the experimental group was 44.69 centimeters (S.D. = 1.53). The mean of head circumference of subjects for both groups were 31.61 centimeters (S.D. = 1.34) and 31.22 centimeters (S.D. = 1.25). In the control group, a mean of hospitalization time of premature infants was 25.75 days (S.D. = 18.09), and the experimental group was 26.7 days (S.D.= 19.15). T-test and Chi-square test reveals that there was no statistical group difference between those characteristics of the control and the experimental group.

Table 6 : Comparison characteristics of premature infants at delivery, and at hospital discharge (D/C), between the control group and the experimental group by Independent t- test.

Characteristic	Control group (n=20)			Experimental group(n=20)			t
	Min-max	Mean	S.D.	Min-max	Mean	S.D.	
Gestational age at delivery (weeks)	30-36	33.7	1.80	28-36	33.00	2.66	-1.04 ^{ns}
Birth weight (grams)	1010- 3170	1945.50	570.09	900-2850	1750.5	565.44	-1.08 ^{ns}
Postconceptional age at D/C (weeks)	36-41	37.35	1.42	36-41	37.50	1.57	.316 ^{ns}
Body weight at D/C (grams)	2020- 3200	2349	324.9	2010- 3300	2262.5	296.98	-.87 ^{ns}
Length at D/C (centimeters)	42.70- 49.00	44.96	1.75	42.50- 48.00	44.69	1.53.	-.51 ^{ns}
Head circumference at D/C(centimeters)	30-34	31.61	1.34	30-34	31.22	1.25	-.95 ^{ns}
Hospitalization time (days)	5-65	25.75	18.09	7-70	26.7	19.15	.16 ^{ns}

ns = not significance (p>.05)

Table 7 : Comparison of sex in the premature infants between the control group and the experimental group by Chi-square test.

Characteristics	Control group (n=20)		Experimental group (n=20)		P
	n	%	n	%	
Sex					
- Male	11	55	8	40	.75 ^{ns}
- Female	9	45	12	60	

ns= not significance ($p>.05$)

Part II : The results of hypothesis testing

Hypothesis 1 states that “The mean score of maternal caregiving behavior of the experimental group one month after discharge is higher than the control group.

At one month after hospital discharge, it could be noted that there were two sides to maternal caregiving behaviors: Universal Self-care Requisites and Developmental Self-Care Requisites. After testing independent t-test , the result showed that the mean scores of Universal Self-Care Requisites between two groups was significantly different, the experimental were higher than the control group ($t = 3.82$, $p<.001$), but the mean score of Developmental Self-Care Requisites was not significantly different ($p > .05$). However, the mean total scores of maternal caregiving behaviors of premature infants’ mother between two groups were significantly different, the experimental were higher than the control group ($t = 3.74$, $p < .001$). The result showed that mothers of premature infants who received the supportive – educative nursing system (SENS) and a usual nursing care had maternal caregiving behaviors scores higher than those who received only usual care nursing (Table 8).

Table 8 : Comparison the mean of total score of maternal caregiving behavior and the mean score of maternal caregiving behavior on premature infants divided into Universal Self-Care Requisites and Developmental Self-Care Requisites between the control group and the experimental group at one month after hospital discharge.

Maternal caregiving behaviors	Control group (n=20)			Experimental group (n=20)			t
	Min-max	Mean	S.D.	Min-max	Mean	S.D.	
Universal Self-Care Requisites	45-57	50.10	3.18	45-60	55.26	5.12	3.82***
Developmental Self-Care Requisites	7-20	17.90	3.34	13-20	19.30	1.89	1.63 ^{ns}
Total score	52-71	64.25	4.66	60-76	70.6	5.98	3.74***

ns = not significant ($p > .05$), *** $p < .001$

Hypothesis 2 states that “The health outcome of the experimental group one month after discharge is better than the control group.”

The growth of premature infants one month after hospital discharge was measured according to their weight, length, and head circumference. Analysis by independent t – test indicated the differences in mean of weight change, length change, and head circumference change of premature infants between the two groups were significantly difference ($t = 3.59$, $p < .001$; $t = 1.98$, $p < .05$; $t = 3.81$, $p < .001$). When focus on weight change, length change and head circumference change in both groups. The normal catch - up growth of premature infant is 15 g / kg/ day. A gain in length of premature infant is average 1 centimeter per week. Head circumference change of the premature infant have increasing between 0.5 - 1

centimeters/week (Klaus, & Fannarolf, 1993: 158-159). The result of this study show that it is not clinical difference in both group. But the mean of weight, length and head circumference of premature infants in the experimental group is higher than the control group (Table 14 in Appendix A).

The majority cases of illness in the control group were diaper rash (85%) and vomiting (80%), while constipation (35%) in the experimental group (Table 9). In case of the frequency in each item of illness, the majority frequency in the control group was diaper rash (37.14%), while constipation (34.81%) in the experimental group (Table 15 in Appendix A). The result showed that at one month after hospital discharge the premature infants whose mothers had received SENS and a usual nursing care had the mean of weight change, length change and head circumference change higher than those who received only the usual nursing care, while the majority of number cases in each illness in the experimental group were lower than the control group.

The characteristic of maternal caregiving behaviors, weight change, length change and head circumference with regards to the changes for both groups were normally distributed, tested by Kolmogorov – Smirnov test of normality ($p > .05$) (Table 23 in Appendix A).

Table 9 : Comparison of the mean of weight change , length change , head circumference change of premature infants one month after hospital discharge between the control and the experimental groups by t-test.

Health outcome	Control group			Experimental group			t
	(n=20)			(n=20)			
	Min-max	Mean	S.D.	Min-max	Mean	S.D.	
Weight change (grams)	470-1480	1031.50	285.69	470-1930	1179	296.91	3.59 ^{***}
Length change (centimeters)	2.5-8.0	5.29	1.49	2.5-8.3	5.76	1.53	1.98 [*]

Table 9: Comparison of the mean of weight change , length change , head circumference change of premature infants one month after hospital discharge between the control and the experimental groups by t-test (continued).

Health outcome	Control group (n=20)			Experimental group (n=20)			t
	Min-max	Mean	S.D.	Min-max	Mean	S.D.	
Head circumference change (centimeters)	0.7-4.0	1.79	0.97	0.7-6.0	2.37	1.21	3.81***

p<.05, *** p<.001

Table 10 : Frequency and percentage cases of the illness of the premature infants one month after hospital discharge in the control and the experimental groups.

Illness of premature infant (case)	Control group		Experimental group	
	n	%	n	%
Conjunctivitis	3	15	1	5
Thrush	7	35	1	5
Abdominal distention	8	40	1	5
Constipation	4	20	7	35
Diarrhea	4	20	2	10
Diaper rash	17	85	2	10
Vomiting	16	80	1	5
Fever	3	15	0	0

CHAPTER V

DISCUSSION

This study was designed to determine the effects of the supportive - educative nursing system on maternal caregiving. The findings are discussed according to the demographic characteristics of the premature infants and their mothers and results of the hypotheses testing of the study.

Premature Infants' Mothers Characteristics

This present study found that the majority of the premature infant's mothers in both groups have a normal distribution ranging in age from 21-30 years (early adulthood) with the average of 27.5 years, the fertility age for having children. Their education level was mostly primary and secondary school in the control group and diploma in the experimental group. Family members in the control group help out with infant care, and assist the mothers about learning through experiences of others, whereas in the experimental group is nuclear. Group members were mostly couples, and in both groups were mostly first time parents. These premature infants' mothers characteristics were similar to the reports of other family of premature infants' mothers studied elsewhere in Thailand (Jutarat Mesukko, B.E. 2540; Wangrungsatid, 2000; Suwanobol, 2000; Tilokskulchai, & et.al., 2002: 74). The experimental group had more infant care experience than the control group. This experience may have certain effects on their decision-making, infant care operation (Somjit Hanuchanrurukul, B.E.2538: 54), preparation and adaptability when compare to those without experience. It may also have an influence on their capability in learning performance on their infants care and their motives in decision-making and learning about handling a baby and may play a part in developing the maternal caregiving behaviors of the mothers. Orem and Taylor (1986: 48) said that experience is a good motive stimulating agency and the use of such dependent-care agency may increase the quality of maternal caregiving behavior.

Premature infants Characteristics

In both groups were mostly primigravida cases with gestational age at 30-36 weeks, birth weight 1,000-3,000 grams. At hospital discharge, they had weight 2,000 – 2,500 grams, length 41 – 50 centimeters, and head circumference 30 – 34 centimeters. Their post-conceptions age at hospital discharge was 36 – 41 weeks. The majority of hospitalization time in both groups was ranged from 1 –20 days. These data were similar to other studies of premature infants (Jutarat Mesukko, B.E. 2540; Wangrungsatid, 2000; Suwannobol, 2000; Tilokskulchai, & et.al., 2002: 74). The characteristics data included basic factors already mentioned that may influence the maternal caregiving of premature infants' mothers. The researcher compared characteristics data from both group by group t-test and Chi - square test which found that both sample groups showed no difference in statistically significant ($p > .05$) as shown in Tables 1, 2, 3 and 4 (Chapter IV).

Maternal Caregiving Behaviors on Premature Infant Care

The finding of this study revealed that at one month after hospital discharge, the mothers of premature infants who received the supportive – educative nursing system and the usual nursing care had maternal caregiving behaviors scores higher than the mothers who received only the usual care with statistically significant ($p < .001$) (Table 8).

This result is explained through the supportive – educative nursing system and its creation of relationship, teaching, guiding and supporting, and environmental management which made the premature infants' mothers aware through their self-development of maternal caregiving behavior and methods to achieve targeted infant care and building confidence in making decision and doing more about maternal caregiving behaviors on premature infant care (Orem, 1995: 149). The researcher wishes to explain this further as follows.

1. Teaching is an appropriate method suitable for development of knowledge enabling the mothers to assess the situation accurately, supporting the mothers in developing their understanding of events. The researcher provided the knowledge on premature infant care presented by the computer assistance instruction (CAI) including definition, characteristics, specificity behaviors, daily care (for instance,

feeding, bathing, clothing, home environment management, sleeping, excretion, mother and infant interaction, preventing infection, abnormal signs and symptoms), an appointment with a neonatologist, and common problems and first aid.

This provides an ongoing positive reinforcement for learning effort. The subjects in the experimental group had positive opinions toward the program. The majority of all users commented that the context of the lesson was an easy learning process to understand the principle. Moreover, this multimedia CAI lesson contains videos, photographs, sound, and text that would facilitate the instruction. The other advantages of the program are color, sound, feedback and enhancement incorporated in the learning. Almost all of the patients further commented that the CAI had provided a high level of increased knowledge in premature infant care as well as lot of essential information which would be beneficial for their material caregiving behaviors.

Since the premature infants' mothers had received the teaching program by CAI, these could assist in situations where parents must make choices or pursue a course of action. According to Orem's (1985) self-care comprises of a purposeful and deliberated action that is learned by the person and directed toward a goal. An individual's knowledge, motivation, and skill could influence the ability to carry out dependent-care. The central requisite for dependent-care is learning how to use the knowledge to perform externally or internally oriented sequence of dependent-care practices (Orem, 1995:215). The performance of activities could be conducted to meet one's needs for care. Thus, the mothers of premature infants need all the information and help about caring for their high-risk infants after hospital discharge. This method is important to develop maternal caregiving behaviors of the premature infant's mother. The successful teaching and learning are based on an appropriate media developed which could reinforce the process (Peterson, 1996: 21-25).

The pre-test and post-test score of the experimental group was significantly different ($p < .01$). The post-test score is higher than the pretest score (Table 21 in Appendix A). The present data is congruent with the finding by Sureeruk Achalapong, (B.E.2543) in the computer-assisted instruction on knowledge of isolated precautions among nursing students can be used to provide nursing student's knowledge. In addition the study by Nongkran Ruangjitt (B.E. 2540) revealed

significant differences in the injection practice readiness of nursing student after receiving the computer assisted instruction for administering injection medication (CAI-AIM) tutorial teaching between before and after receiving the tutorial teaching. Moreover, study has not been done about the advantage of CAI with regards to the care-giver. This study pioneered the use of CAI as a media for teaching the caregiving. Even though CAI is an interesting media, and the user could look up the information over and over, but for this research the experimental group did it in the following manner. Out of the 19 users, only one person looked over at the information on CAI twice which is different from a study done by Choyhirun (2001:136) who studied the effects of computer – assisted instruction in SENS on self-care practice in school age children with nephrotic syndrome which found that the frequency of CAI program usage ranged from 1-9 times and the mean of this frequency was 3.10 times (Table 18 in Appendix A). Even though the researcher provided the viewing room for CAI, the members of the experimental group were reluctant to express their needs to look at the CAI to the staff. Initial CAI viewing was introduced to the experimental group by the researcher and subsequent viewing could be arranged by informing the nursing staff of the neonatal care unit. In addition, it was different in education level of the experimental group that might be effect on their anxiety, and abilities to use CAI. Some mothers said that they never used computer and afraid to use it. Furthermore, the information on the CAI might be very easy to understand, so the experimental group members might feel that looking at it once was enough . And this is the first time that the CAI was used, so it might not be as complete as it should in terms of media quality which must be revised. Further more, every mothers in the experimental group had participated with the CAI content in every pages (Table 19 in Appendix A). All in all the experimental group members who had the opportunity to use the CAI comment that they liked it very much because it is something new, different, up to date, and interesting.

2. Guiding and supporting. This will make the mother believe and thrust which will enhance premature infant care. The researcher watched the mothers in the experimental group continually on daily basis before their baby discharge from the hospital and one-time follow-up by home visit at one week after hospital discharge. The researcher made follow-up visit in supporting and guiding by home visit at one

week after hospital discharge on their problems and doubts. It was found that mothers are very attentive in infant care. Every mother was very happy about the home visits and they said that the first week back is the time of crisis and this is when they need guidance, support and confidence the most which goes according to a study by Mckim (1993: 89-96); Mckim & et.al. (1995: 184-193); and Jutarat Mesukko (B.E.2540:97). After receiving home visits, the experimental group felt more confident and had received useful advice about problems. There problems were feeding, gastrointestinal problems (constipation, abdominal distention), anxiety, sleep pattern problem and colic. It can describe that home visits give a more accurate assessment of the family structure, the natural or home environment, and behavior in that environment. Home visit also provide opportunities to identify both barriers for reaching family health promotion goals such as approve the health outcome of the baby. The advantage of home visits includes convenience for the mother, the mother control of the setting, the ability to individualize services, a natural, relaxed environment for the discussion of concern and needs.(Stanhope, & Lancaster, 2002: 306). It is congruent with the study of Kange, et al. (1995) who study preterm infant follow-up project: a multi-site field experiment of hospital and home intervention programs for mothers and preterm infants. The result revealed that this project is cost-effective treatments for families with healthy preterm infant. It is promoting positive developmental outcomes for preterm infants via improved mother-infant interactions. There are limiting factors concerning home visits as well. These are the expenses and the safety of the visitor in the case where the visitor goes alone. Cost are a major disadvantage. The cost is high for: pre-visit preparation, travel to and from the home, time spent with one client .And because the hospital that is involved is an education center that does not have a home visits unit, there should be a follow up perform by the public health care center in the area to have continuous care. In addition, after hospital discharge the researcher provided telephone advice all time for the mothers by nurses of neonatal care unit and the researcher. The telephone advice guideline was used by the researches and the staff nurses of neonatal care unit. In this study, the experimental group called to ask about premature infant care 13 times while the control group called 34 times. It also revealed that the experimental group received home visits that may have provided the mothers with the opportunity to ask about their problems. There were seven mothers

who made phone calls to the researcher and five mothers calls to the staff nurse of neonatal care unit, to ask question about the feeding, rash, common cold, abdominal distension, regurgitation, constipation and diarrhea (Table 16 in appendix A), and some mothers said that nurses gave advices differently. Even though a meeting was arranged for all the nurses of the neonatal care unit and telephone guidelines were given, this research could not control the way nurses give advice in order to create uniformity. Therefore, this is something that needs attention to standardize the guideline. The guideline should include common problems and frequently asked questions.

Every strategies used with supportive nursing, according to the assessed requirements obtained from each mother inclusive of having the mother participate in infant care from the time of discharge planning in terms of what they can do for themselves. For instance, mother were encouraged in clean up, bathing infants, embracing infants, breast feeding, including support and guidance when they performed inaccurately such as, incorrectly holding infants or lack of milk. The researches encouraged them when they perform in a wrong manner, asking them to take self control in the decision-making process to choose the proper method of infant care and exchange of experience with the researcher and the other mothers to create more confidence.

After asking both groups, it was found that they received information from other sources as well. The control group got information from the neonatal nurses of Maharaj Nakorn Chiang Mai Hospital, public health staff, magazines, clinics, cousins, and friends. The experimental group got information from neonatal nurses of Maharaj Nakorn Chiang Mai Hospital, cousins, handbook of this study and neighbors (Table 17 in Appendix A). Information from these sources may have an effect on maternal caregiving behavior.

3. Managing Environment. The researcher provided infant care practice for the mothers such as, clean up, bathing infants, embracing infants, breast/bottle feeding and chest physiotherapy, etc. Mostly mothers in the experimental group exchanged infant care method of infants in the hospital, which was adjudged as a creation of good environment as a means to increase their mothers in the experimental group to change their behavior (Orem,1995: 215-222) to achieve their target in the maternal

caregiving behaviors of premature infant mothers. All mothers explained their anxiety, afraid to care their infant. The researcher encouraged them to did their infant care with themselves and watched the mothers closely. After that they could take care there babies. Moreover, the researcher has distributed to each of the mother in the experimental group the premature infant care's handbook for mothers to refresh their memory about premature infant care. This handbook could be used to review the knowledge already acquired at home, and to solve some problems which might occur after hospital discharge. All mothers in the experimental group told the researcher that the handbook could be used to help them solve some problems of premature infant care and they appreciated the graphic layout. The study by Nongnuch Vithsyachokitikul (B.E. 2536:66) has found that the experimental group receiving the handbook has higher score than the control group which is consistent with the study by Somsrong Koafai (B.E.2541: D-E). This study on the effects of maternal preparation on the practice of infant care, self-efficacy and care behavior has found that the experimental group had better care than the control group.

The supportive-educative nursing system administered to the experimental group from when they arrived in the hospital until 4-6 weeks after delivery helped in giving them confidence in infant care, being a development stage of the maternal caregiving behaviors. So the maternal caregiving behavior scores in this experimental group were higher than in the control group. In case of the developmental self-care requisited mean score of both group was not different. The mothers and infants interaction might be a major factor in creating a good motive, fostering their love of and attention to their infant and their responsibility towards infant care (Klause&kennel, 1976 : 88). Maternal-infant attachment or maternal infant bonding is a unique relationship that specific and endures through time. This relationship has profound effects on the child's physical, psychological, and intellectual development (Klause& Kennel, 1982). The motive was a part of the 10 power components that help stimulate the use at the dependent-care agency and the operating in infant care under the Orem's theory (Orem&Taylor, 1986:48). After evaluating the maternal caregiving behavior scores of the subjects for each item in the control group and the experimental group, it was found that questions with the score less than 3 are question 7 which is "After breast-fed or formula-fed, the mother feeds water after" (Mean = 2.05, S.D. = 1.09) and

question 2 which is “Waking up the infant for feeding after the infant slept past feeding time” (mean = 2.10, S.D. = 1.14). For the experimental group, the mean score for each item is greater than 3 for all of the questions (Table 12 in appendix A). The result show that the experimental group did the correctly maternal caregiving behaviors more frequently than the control group.

It was evident that the supportive-educative nursing system is an inseparable activity when it was conducted effectively as planned in fostering the development at the maternal caregiving behaviors of premature infants’ mothers. The result of this study congruent in addition a study by Wangruangsatid (2000 : IV) has found that the experimental group members who had received a maternal preparation plan, a sound and slide presentation and a handbook about caregiving for a premature infant had the mean score of knowledge on premature infant care in the immediate post-preparation higher than that in pre-preparation with a statistically significant difference. Also, the score of knowledge on premature infant care is related to the score of behavior on premature infant care one month after hospital discharge with a statistically significant difference which is consistent with a study by Suwannobol (2000). She study the effects of supportive-educative nursing system on anxiety, dependent-care agency of the mothers and growth of the preterm infants. Orem’s theory was used as the conceptual frame work for this study. This study supported Orem’s theory in providing guidance for reduce anxiety and developing dependent-care agency, and guidance for effective practice of nursing care. The present study assessed the capabilities for self care operation through the maternal caregiving behavior. The finding supports the correctness of Orem’s theory, providing that the nursing system was a key factor in developing the maternal caregiving behavior of premature infants’ mothers.

The health Outcome of Premature Infants

Hypothesis II stated that: The health outcome of premature infants of the experimental group one month after discharge is better than the control group.

The result of this study found that weight change, length change and head circumference change of the experimental group one month after hospital discharge

was higher than these in the control group with a significant difference ($p < .001$; $p < .05$; $p < .001$) . number of cases of illness in the experimental group one month after discharge was lower than those in the control group . This result supports the hypothesis.

The hypothesis test is an assessment of the result of the maternal caregiving behavior, with the mothers having the potential of developing the capability and ability to care for their infants. After evaluating the growth which includes weight change, length change and head circumference change of the infant one month after hospital discharge, the experimental group had higher means than the control group. In addition, illness one month after discharge, the experimental group had lower cases than the control group.

The researcher has found in the premature infants gestational age 30-36 weeks, with no complication after delivery. At the second stage of postpartum period that the body weight consequently increased at a slow pace with a growth rate similar to the growth of other infant at the same gestational age. At the third stage which is the period for foster growth and the period of time that infants are near gestation age to 36-41 weeks. This study was done at the time infants were discharged to their homes under this supportive - educative nursing system with the researcher as the supervisor of this activity. At the fourth stage, the time that the infants have gestational age 40 weeks, the infant's growth will be the same as the normal growth in a normal state, as the infants in this study at age 4 weeks and will be equal to twice the growth of the newborn of the time that the infants' growth result will be follow up. After evaluating the growth which includes weight change, length change and head circumference change of the infant one month after hospital discharge, the experimental group had higher means than the control group. It was discovered that the experimental group had body weight from 3,300 – 4,510 grams with the average of 3,559.50 grams (S.D. = 355.9) and the control group had body weight from 2820 – 4490 grams with the average of 3,380 grams (S.D. = 368.17). On the length, the experimental group had from 49.0-56.7 centimeters with the average of 51.06 centimeters (S.D. = 1.61) and the control group had from 48-53 centimeters the average of 50.05 centimeters (S.D. = 1.36). On head circumference, the experimental group had from 31.5-37.5 centimeters with the average of 32.9 centimeters (S.D. = 1.59) and the control group

has from 31-35 centimeters the average of 32.41 centimeters (S.D. = 1.17) (Table 13 in Appendix A). In Thailand, no one has studied the database concerning the growth rate in all Thai premature infants which made it difficult for the researcher to compare the growth rate with the standard of Thai pre-term infant growth rate. When comparing the growth rate with a another research by Suwannobol (2000: 84) who did a study the effects of the supportive-educative nursing system (SENS) on growth of the premature infants with very similar types of sampling groups , it was found that the growth of premature infants at 4-6 weeks after delivery included body weight, length and head circumference in the experimental group had the average growth very close to each other. However, when the body weight was compared, the change in the weight on the day of the appointment of the experimental group of this study was 39.31 grams/day while the control group was 34.38 grams/day (Table 14 in Appendix A) which agreed with the result of a study by Wangruangsatid (2000:72) who studied the effects of maternal preparation on knowledge and caregiving behavior towards premature infants after discharge. The study by Wangruangsatid found that the change in weight in the prepared group had a change in weight of more than 22 grams/day. But this study has a higher weight change when compare with a study by both Wangruangsatid and a study by Peterson & Frank, 1987 in Taeusch & Yogman (Ed.) (p.188) (23grams/day). When focus on weight change, length change and head circumference change in both groups are in normal rate. The catch - up growth of premature infants is increasing at rates of 30 kg /day . A gain in length of premature infant is average 1 centimeter per week. Head circumference change of the premature infant have increasing between 0.5 - 1 centimeters/week (Klaus, & Fannarolf, 1993: 158-159) . The result of this study show that it is not clinical difference in both group. But the mean of weight, length and head circumference of premature infants in the experimental group is higher than the control group And home visits at one week after hospital discharge by the researcher and telephone advice for all time by the researcher and the nurses of neonatal care units, it was found that mothers were attentive in raising their questions, telling their incidents with infants. There were 13 times that mothers in the experimental group asking questions about their infant care while in the control group, the mothers asked the questions for 34 times. The data showed that the experimental group had lower questions about their infant care less

than the control group. The majority of questions from the control group were about constipation (10 times) and feeding (4 times) while the experimental group had questions 4 times about both constipation and feeding (Table 16 in Appendix A). Showing that the relationship, follow-up, guidance and support by the researcher with the mothers in the experimental group under the supportive-educative nursing system plan have been successful, helping the mother to be able to practice their capability in caring for their infants correctly by having their infant weight increase faster than the control group infant's weight. Such results are consistent with the study of Sirituntawat (B.E.2534:A-B) who studied the effects of supportive intervention plans in reducing anxiety and increasing adaptability of the mothers of premature infants. The results found that the experimental group infant's weight at 30 days rising more than the control group infant's.

Therefore, the researcher conducted the supportive-education nursing system. This system provides more opportunity for the mothers to learn more about infant care to their full capacity. They can learn to solve problems and build up their skill on child care in response to the need of their babies. During the implementation of the system, the researcher could give and solve problems with regards to each of the mothers and babies needs. The mother not only gained more knowledge but also felt more confident about premature infant care that has to do with illness of a premature infant after hospital discharge. Most symptoms of common problems in premature infant occurred in the control group. While in the experimental group, 7 out of 8 symptoms occurred with the exception for fever. The frequency of illness in each symptom in the experimental group is lower than the control group (Table 15 in Appendix A). The most common problem in the experimental group was constipation, while the control group was vomiting. These common problems occurred because of an immature gastrointestinal tract. The control group has diaper rash that occurred because of maternal caregiving behavior. Analysis of the causes of the illness indicated that some incorrect behavior on caregiving such as the changeable weather at that time, the change in the mother's diets and the babies care by others were all causes for illness. When focusing on the illnesses in both groups, there are 3 groups of illnesses: infection (conjunctivitis, thrush, and fever), gastrointestinal problems (abdominal distention, constipation, diarrhea and vomiting) and diaper rash. The

cause of illnesses came from caregiving behavior except for constipation which was caused by biological and caregiving behavior. Caregiving behavior alone could not solve this symptom because medical treatment is needed.

The finding from this study shows that when comparing the average score, the behavior of mothers who received the supportive educative nursing system (SENS) were higher than those who received the usual nursing care. The increase in weight, length, and head circumference were higher. Fewer cases of illnesses were reported. When comparing the two different nursing cares, the differences are as follows:

1. Instructional media. The SENS use CAI to instruct the mothers, but the usual nursing care have none.
2. Handbook. The every mothers in SENS received the premature infant care handbook, but the mothers in the usual nursing care received the premature infant care brochure that was created by the nursing health education of pediatric department. The nurse will give the brochure (only) when the premature mothers mention their needs.
3. Home visit. The mothers in SENS received home visits from the researcher, but the mothers in the usual nursing care did not.
4. Telephone advising. The mothers in SENS received the SENS telephone advising, but the mothers in usual nursing care received telephone advice from the nurses of neonatal care unit without telephone guideline.

All of these differences affected the result of this study.

In addition, this study is a blind study. It is an experimental procedure in which neither the subjects of the experiment nor the people administering the experiment know the critical aspects of the experiment. A blind procedure is used to guard against both experimenter bias and variable effects (<http://www.thefredictionary.com>). The research assistant did not know which sample is in the control group or in the experimental group. This design is strongly recommended to the result of this study, but it studied in the one area. Therefore, this result cannot be used as generalization for wider area.

CHAPTER VI

CONCLUSION

This quasi – experimental research was conducted to determine the effects of supportive – educative nursing system on maternal caregiving behavior and health outcomes of premature infant after hospital discharge. Orem’s self-care and nursing system were used as the conceptual framework of this study. The samples in this study were 40 premature infants’ mothers who visited their infants at the neonatal care units of the tertiary care hospital in Chiang Mai, from January to October 2003. They were divided into two groups: the control and the experimental group (20 days for each group). The samples were selected using a purposive sampling according to the criteria setting. The inclusion criteria for the samples were mothers who (1) had a first premature infant with gestational age less than 37 weeks, (2) took care of the baby by herself after hospital discharge , (3) willing to participate in this study , and premature infant who (1) had gestational age less than 37 weeks at birth and an apgar score more than 7 , (2) had no problems with sucking and swallowing , no congenital and endocrine disease by the infant , (3) had post-conceptional age between 37 – 40 weeks at discharge , (4) had body weight greater then 2000 grams at discharge . The premature infants’ mothers in the control group received the usual nursing care provided by staff nurses and the usual follow-up care after being discharge from the hospital. On the other hand, the premature infant’s mother in the experimental group received the usual nursing care and the support-educative nursing system.

There were two types of instruments use in this study: the data collection instruments and the instruments used in the research procedure. The instruments for data collection included the Demographic Data Form, the Maternal Caregiving Behavior Questionnaire, the Record Form of Heath Outcome of Premature Infant After Discharge and the Premature Infant Behavior Record Form after Hospital for Mothers.

The instruments use in the research procedure included the Computer-Assisted Instruction (CAI) named “ Premature infant care for mother”, the Premature infant Caregiving Handbook , the Telephone Advising Guideline , and the Growth Measured Instruments . The instruments use in the research procedure included the Computer-Assisted Instruction (CAI) named “ Premature infant care for mother”, the Premature infant Caregiving Handbook , the Telephone Advising Guideline , and the Growth Measured Instruments .

Data collection started with the control group follow by the experimental group. This was designed to prevent contamination of nursing care and to avoid causing unnecessary feeling of inequality or unfairness in care between the two groups. All subjects from both groups were explained about the research subjects and data collection procedures. The protection of human rights was ensured, and the informed consent forms concerning participation in this study were read and signed by the premature infants’ mothers. All demographic data of the subjects were collected first, during the discharge date and an appointment date, the mothers did self-report (the Premature Infant Illness Record Form after Hospital for Mothers) and at High-Risk Clinic the research assistant asked the mothers to fill out the questionnaire about maternal caregiving behaviors on premature infant care. The data collection at High-Risk Clinic, Pediatric Out-Patient Department were collected by the research assistant using a blind method.

All data were analyzed using the computer package for Window Program. The results of the study are summarized as follows:

1. The mean score for maternal caregiving behaviors one month after hospital discharge in the experimental group was significantly higher than in the control group ($p < .001$).
2. The mean of weight change, length change, and head circumference change of premature infants one month after hospital discharge between the two groups was significantly difference ($p < .001$; $p < .05$; $p < .001$).
3. The number of cases in premature infant’s illness includes: conjunctivitis, thrush, abdominal distention, constipation, diarrhea, diaper rash, vomiting, and fever at one month after hospital discharge in the experimental group was lower than the control group.

Limitation

1. In this study, the data collection began with the control group and before proceeding to the experimental group. This designed was selected to prevent the contamination from intervention by the control group. However, despite such attempt, the researcher could not totally control the subjects' exposure to the information as other staff nurses may offer instruction to the subjects. Thus, it might have been possible that both groups of premature infants' mothers and health outcome of the premature infants were due to the different environmental situation and the unexpected exposure to the necessary information.

2. The samples were not collect using randomized sampling technique but selected by purposive sampling. Thus, the results of the study could be generalized to a population sampling to the sample.

3. The instruction given by other staffs and the others information resource purposive their own nursing cares could not be controlled by the researcher.

4. At the appointed time, the period of day after hospital discharge did not totaled to 30 days (28-32 days in both groups) for each case. It might have affected the health outcome.

Recommendation

The finding of this study provides several implications for the nursing profession including nursing practice, nursing education, and further nursing research.

Implications for nursing practice

1. To increase the weight, length and head circumference of premature infant, the supportive-educative nursing system (SENS) should be used. The SENS are:

1.1 Teaching the mother about the premature infant care by using the computer assistance instruction (CAI).

1.2 Guiding and supporting the mother by telephone advice with telephone advice guideline after their child discharged to home.

1.3 Managing the environment condition by providing an opportunity for mother to practice the infant care during their child hospitalized and developing handbook for giving the mother as a knowledge resources.

This system could be applied in clinical practice for newborn infants to improve maternal caregiving behavior and the health outcome of infants.

2. This system could be applied in clinical practice for newborn infants to decrease the illness. In the case of common problems, the suggestion for constipation should be added to the knowledge of treatment where some medication might be needed. The mother should consult with the doctor before using medication.

Implications of nursing education

The role of professional nurse has changed over the years. At present, nurses are charged with responsibility for not only providing quality care for the patient and their family in the hospital, but also performing needed caregiving at their home. In order to prepare nursing students for this expanded role, the nursing curriculum should be dedicated to teaching of continual care, referral system and multi-disciplinary care.

Implications of nursing research

1. To study the effects of the supportive-educative nursing system on maternal caregiving in other setting including the private hospital.
2. To study the effects of the supportive-educative nursing system on the health outcome of the premature infants in the longitudinal study .
3. To study the effects of the supportive-educative nursing system on caregiving behavior on the others primary caregiving.
4. To study the effects of the supportive-educative nursing system on caregiving behavior concerning others abnormality in premature infants for instance bronchopulmonary displasia or birth asphyxia.
5. The CAI multimedia named “Premature Infant Care” need to be revised for a completed content and debug script.
6. To study the growth of premature infant in all regions of Thailand for the national database.

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APPENDIX A

Table 11 : Frequency and percentage of age, family income of premature infant's mothers and gestational age, birth weight, post-conceptional age at hospital discharge (D/C), body weight at D/C , length at hospital discharge, head circumference at D/C, hospitalization time of premature infants in the control and experimental group (continued).

Characteristics	Control group (n=20)		Experimental group(n=20)	
	Frequency	Percentage	Frequency	Percentage
Age (years old)				
15-20	2	10	3	15
21-25	6	30	1	5
26-30	7	35	11	55
31-35	3	15	4	20
36-40	1	5	1	5
41-45	1	5	-	-
Family income (bath/month)				
<5,000	2	10	5	25
5,000-10,000	13	65	8	40
>10,000	5	25	7	35

Table 11 : Frequency and percentage of age, family income of premature infant's mothers and gestational age, birth weight, post-conceptional age at hospital discharge (D/C), body weight at D/C , length at hospital discharge, head circumference at D/C, hospitalization time of premature infants in the control and experimental group (continued).

Characteristics	Control group		Experimental group	
	Frequency	Percentage	Frequency	Percentage
Gestational age at delivery (weeks)				
27-29	-	-	3	15
30-33	7	35	8	40
34-36	13	65	9	45
Birth weight (grams)				
<1,000	-	-	2	10
1,000-1500	6	30	6	30
1,501-2,000	6	30	6	30
2,001-2,500	5	25	4	20
2,501-3,000	2	10	2	10

Table 11 : Frequency and percentage of age, family income of premature infant's mothers and gestational age, birth weight, post-conceptional at hospital discharge (D/C), body weight at D/C , length at hospital discharge, head circumference at D/C, hospitalization time of premature infants in the control and experimental group (continued).

Characteristics	Control group		Experimental group	
	Frequency	Percentage	Frequency	Percentage
Birth weight (grams)				
(cont.)				
3,001-3,500	1	5	-	-
Post - conceptional age				
(weeks)				
36-37	15	75	9	45
38-41	5	25	11	55
Body weight at D/C				
(grams)				
2,000-2,500	16	80	17	85
2,501-3,000	2	10	2	10
3,001-3,500	2	10	1	5

Table11 : Frequency and percentage of age, family income of premature infant's mothers and gestational age, birth weight, post-conceptional at hospital discharge (D/C), body weight at D/C , length at hospital discharge, head circumference at D/C, hospitalization time of premature infants in the control and experimental group (continued).

Characteristics	Control group		Experimental group	
	Frequency	Percentage	Frequency	Percentage
Length at D/C				
(centimeters)				
41-45	12	60	16	80
46-50	8	40	4	20
Head circumference at				
D/C (centimeters)				
30-31	-	-	12	60
31.1-32	13	65	2	10
32.1-33	3	15	5	20
33.1-34	4	20	1	5

Table 11 : Frequency and percentage of age, family income of premature infant's mothers and gestational age, birth weight, post-conceptional at hospital discharge (D/C), body weight at D/C , length at hospital discharge, head circumference at D/C, hospitalization time of premature infants in the control and experimental group (continued).

Characteristics	Control group		Experimental group	
	Frequency	Percentage	Frequency	Percentage
Hospitalization time				
(days)				
1-20	9	45	9	45
21-40	7	35	7	35
41-60	2	10	3	15
61-80	2	10	1	5

Table 12 : The frequency, percentage, mean and standard deviation of the maternal caregiving behaviors scores of the subjects for each item in the control group and the experimental group.

พฤติกรรมมารดาในการดูแลทารกคลอดก่อนกำหนด	กลุ่มทดลอง						กลุ่มทดลอง					
	คะแนน				Mean	S.D	คะแนน				Mean	S.D
	4	3	2	1			4	3	2	1		
1. เมื่อทารกหลับจะดูนม ท่านปลุกทารกให้ตื่นมาดูดนมต่อไปอีก	5	4	8	3	2.55	1.05	11	4	1	4	3.10	1.21
2. ท่านปลุกทารกให้ตื่นมาดูดนม เมื่อทารกหลับนานจนเลยหมอน	4	1	7	8	2.10	1.14	11	2	3	4	3.00	1.26
3. ท่านล้างมือก่อนให้นมบุตรหรือก่อนขงนมให้บุตร	7	7	5	1	3.00	0.91	13	4	3	0	3.50	0.7
4. ท่านทำความสะอาดหัวนมก่อนให้นมบุตรหรือต้มขวดนมก่อนนำมาขงนมให้บุตร	16	3	0	1	3.7	0.73	19	1	0	0	3.95	0.22
5. กรณีให้นมแม่ท่านอุ้มทารกให้ปากพอดีกับลานนมหรือกรณีให้นมขวดให้น้ำนมท่วมลานขณะให้ทารกดูดนมขวด	17	2	0	1	3.75	0.72	18	2	0	0	3.90	0.31
6. หลังจากให้นมทารกเสร็จแล้ว จับทารกเรอ	18	1	1	0	3.85	0.49	19	0	0	1	3.85	0.67

Table 12 : The frequency, percentage, mean and standard deviation of the maternal caregiving behaviors scores of the subjects in the control group and the experimental group (continued).

พฤติกรรมมารดาในการดูแลทารกคลอดก่อนกำหนด	กลุ่มทดลอง						กลุ่มทดลอง					
	คะแนน				Mean	S.D	คะแนน				Mean	S.D
	4	3	2	1			4	3	2	1		
7. หลังจากให้นมมารดาหรือผสม ท่านให้ทารกดูดน้ำ สะอาดตาม	2	6	3	9	2.05	1.09	11	6	1	2	3.30	0.97
8. ท่านระมัดระวังอย่างน้อยสัปดาห์ละ 2 ครั้ง	17	1	1	1	3.70	0.80	18	0	0	2	3.70	0.92
9. ขณะอาบน้ำท่านได้สังเกตอาการผิดปกติตามร่างกาย ทารก	15	5	0	0	3.75	0.44	19	1	0	0	3.95	0.22
10. ท่านห้ามผ้าให้ทารกที่ทารกขณะทารกหลับ	19	0	1	0	3.90	0.44	16	2	2	0	3.70	0.66
11. ท่านทำความสะอาดอวัยวะสืบพันธุ์ด้วยน้ำ ผ้าหรือ สำลีชุบน้ำสะอาดหลังการกักถ่าย	16	1	2	1	3.60	0.88	17	1	2	0	3.75	0.63
12. ท่านสวดภาวนาขณะให้นม	14	3	2	1	3.50	0.88	17	2	1	0	3.80	0.52
13. ท่านดูสบสัมผัสทารกขณะให้นม	13	5	1	1	3.50	0.82	17	3	0	0	3.85	0.36
14. เมื่อทารกร้อง ท่านปลอบทารก(อุ้มหรือ สัมผัส หรือ พูดคุย หรือ ร้องเพลงกล่อม)	17	2	1	0	3.80	0.52	18	1	1	0	3.85	0.49

Table 12 : The frequency, percentage, mean and standard deviation of the maternal caregiving behaviors scores of the subjects in the control group and the experimental group (continued).

พฤติกรรมมารดาในการดูแลทารกคลอดก่อนกำหนด	กลุ่มทดลอง						กลุ่มทดลอง					
	คะแนน			Mean	S.D		คะแนน			Mean	S.D	
	4	3	2				4	3	2			
15. นอกจากนมมารดาหรือนมผสมแล้ว ท่านให้ทารกได้ รับ น้ำดื่มหรือกล้วยครูด	17	3	0	0	3.85	0.37	20	0	0	4.00	0	
16. ท่านนำทารกไปซื้อของที่ห้างสรรพสินค้าหรืองาน มงคลต่างๆ	18	1	1	0	3.80	0.69	18	2	0	3.90	0.31	
17. ท่านยิ้มกับทารกขณะลูบสัมผัส	16	0	2	2	3.50	1.05	18	2	0	3.90	0.31	
18. ท่านพูดคุยหยอกล้อด้วยน้ำเสียงสูงต่ำกับทารก	16	1	2	1	3.60	0.88	18	2	0	3.90	0.31	
19. ท่านแขวนของเล่นห่างจากสายตาประมาณ 2 ฟุตให้ ทารกดู	12	0	0	8	2.80	1.51	18	0	0	3.70	0.92	

Table 13 : Comparison of the mean of weight, length, head circumference of the premature infants one month after hospital discharge between the control and the experimental groups by t-test.

Health outcome	Control group (n=20)			Experimental group (n=20)			t
	Min-max	Mean	SD	Min-max	Mean	SD	
Weight (grams)	2,820-4,490	3380.50	368.17	2820-4510	3,485	357.69	.1.90 ^{ns}
Length (centimeters)	48-53	50.25	1.33	48.0-54.0	50.73	1.30	2.45 ^{**}
Head circumference (centimeters)	31-35	32.41	1.17	31.0-37.5	33.22	1.55	3.81 ^{***}

^{ns} p > , ** p < .01, *** p < .001

Table 14 : Comparison of the mean of weight rate , length rate, head circumference rate of the premature infants one month after hospital discharge between the control and the experimental groups by t-test.

Health outcome	Control group (n=20)			Experimental group (n=20)			t
	Min-max	Mean	SD	Min-max	Mean	SD	
Weight rate(grams/days)	15.67-49.33	34.38	9.52	15.67-64.33	39.31	9.89	3.59***
Length rate (centimeters/weeks)	2.00-1.79	1.28	0.45	0.21-2.08	1.42	0.43	2.17*
Head circumference rate (centimeters/weeks)	1.00-0.82	0.45	0.24	0.15-1.5	0.58	.31	2.86**

* p < .05, ** p < .01, *** p < .001

Table 15 : Frequency and percentage of the illness' times of the premature infants one month after hospital discharge in the control and the experimental groups.

Number of Illness (time)	Control group		Experimental group	
	frequency	%	frequency	%
Conjunctivitis	4	4.30	1	4.35
Thrush	12	12.90	1	4.35
Abdominal distention	11	11.83	1	4.35
Constipation	5	5.38	8	34.81
Diarrhea	13	13.97	2	8.70
Diaper rash	35	37.64	5	21.74
Vomiting	3	2.323	3	13.10
Fever	10	10.75	0	0
Total	93	100	23	100

Table 16 : Frequency by telephone advisory of premature infant's mothers in the control and the experimental groups .

Illness	Control group	Experimental group
	Frequency	Frequency
Vomiting	5	1
Thrush	2	-
Rash	2	-
Diarrhea	5	-
Constipation	10	5
Feeding	4	4
Abdominal distention	3	-
Cough	1	-
Respiratory	1	-
Development	1	-
Cry	-	2
Conjunctivitis	-	1
Startle	-	1
Total	34	13

Table 17 : Information resources for premature infant's mothers in the control and the experimental groups.

Group	Information resources
Control	Nurse, Public health staff, Magazine, Clinic, Cousin, Friend
Experimental	Nurse, Cousin, Handbook, Neighborhood

Table 18 :The min, max, means, standard deviation of frequency of using CAI.

	Min-Max	Mean	S.D.
Frequency of using the CAI program	1-2	1.05	0.22



Table 19 : The analyze of the CAI user log file.

Users	Total page open	Total key press	Total left mouse click	Total right mouse click
1	85	14	104	0
2	85	39	92	0
3	85	12	89	0
4	85	10	94	0
5	85	34	101	1
6	85	16	106	0
7	85	19	87	0
8	85	29	88	0
9	85	18	98	0
10	85	16	92	0
11	85	14	90	0
12	85	13	105	0
13	85	17	99	0
14	85	9	103	0
15	85	19	101	0
16	85	12	97	0
17	85	10	105	0
18	85	25	89	0
19	85	11	91	0
20	85	16	99	0

Table 20 : The score of the pre-test and post-test in CAI of premature infant's mother knowledge in the experimental group.

No.of premature infant's mother	Pretest	Post-test
1	17	18
2	13	16
3	16	16
4	18	18
5	14	17
6	16	18
7	19	20
8	16	16
9	6	19
10	14	17
11	17	16
12	18	15
13	16	17
14	18	18
15	17	19
16	14	17
17	18	19
18	16	18
19	16	20
20	17	20

Table 21 : The comparison of difference in the pre-test and post- test mean score of the CAI lesson in the experimental group by Pair t-test.

CAI lesson score	Mean	SD	t	p
Pre-test	15.80	2.08	-2.73	.013*
Post-test	17.70	1.49		

* p < .05

Table 22 : The efficiency of the computer-assisted instruction program.

CAI lesson score	Sum	Full score	N	Ea	Eb	E-CAI
Pre-test	316	20	20	.79	-	83.5
Post-test	354	20	20	-	.88	

Test of Normality

The characteristics of dependent variable were tested of the normality by Kolmogorov-Sminov Goodness of fit test.

Table 23 : Test of mean scores of maternal care giving behavior, weight change , length change , head circumference at one month after hospital discharge by Kolmogorov-Smirnov Goodness of fit test.

Group	Kolmogorov-Smirnov		
	Statistic	df	Sig
Maternal care giving behavior			
experimental group	.144	20	.200
control group	.165	20	.156
Weight change at one month after hospital discharge			
experimental group	.127	20	.200
control group	.171	20	.126
Length change at one month after hospital discharge			
experimental group	1.59	20	.199
control group	.127	20	.200
Head circumference change at one month after hospital discharge			
experimental group	.144	20	.200
control group	.165	20	.156





ที่ ทม ๐๖๐๕/ 404

เรื่อง ยินดีให้นักศึกษาเข้าเก็บข้อมูลเพื่อประกอบการทำวิทยานิพนธ์

เรียน คณะบดีบัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล

อ้างถึง หนังสือ ที่ ทม ๐๘๐๒.๐๑(ศช)/๕๔๕๒ ลงวันที่ ๑๓ ธันวาคม ๒๕๕๔

คณะแพทยศาสตร์ มหาวิทยาลัยเชียงใหม่
๑๑๐ ถนนอินทวิโรตต์ อำเภอเมืองเชียงใหม่
จังหวัดเชียงใหม่ ๕๐๒๐๐

13 มกราคม ๒๕๕๖

ตามหนังสือที่ยังถึง บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล ขอความอนุเคราะห์ให้ นางสาวเนตรทอง ทะษา นักศึกษาหลักสูตรปริญญาโท สาขาวิชาการพยาบาลเด็ก คณะแพทยศาสตร์โรงพยาบาลรามาธิบดี เข้าเก็บข้อมูลจากมารดาของทารกคลอดก่อนกำหนด อายุครรภ์น้อยกว่า ๓๗ สัปดาห์ ที่มาเยี่ยมบุตรที่หอผู้ป่วยทารกแรกเกิด ๓ และหอผู้ป่วยทารกแรกเกิด ๔ และเมื่อพบบุตรมาตรวจตามแพทย์นัด เมื่ออายุ ๑ เดือน ที่แผนกผู้ป่วยนอก คลินิกเด็กป่วยพิเศษ ฝ่ายการพยาบาล โรงพยาบาลมหาราชนครเชียงใหม่ คณะแพทยศาสตร์ มหาวิทยาลัยเชียงใหม่ เพื่อนำข้อมูลที่ได้ไปประกอบการทำวิจัย เรื่อง “ผลของการพยาบาลระบบการสนับสนุน และให้ความรู้แก่มารดาทารกคลอดก่อนกำหนดต่อพฤติกรรมการดูแลของมารดาและผลลัพธ์สุขภาพทารกภายหลังจำหน่ายออกจากโรงพยาบาล” ตั้งแต่เดือนธันวาคม ๒๕๕๕ ถึงวันที่ ๓๐ พฤษภาคม ๒๕๕๖ นั้น

คณะแพทยศาสตร์ มหาวิทยาลัยเชียงใหม่ พิจารณาแล้วไม่ขัดข้องประการใด ยินดีให้ นางสาวเนตรทอง ทะษา เข้าเก็บข้อมูลได้ตามกำหนดวันที่แจ้งไป ทั้งนี้ เมื่อผลการวิจัยเสร็จสิ้นลงแล้ว ขอให้โปรดจัดส่งผลการวิจัยให้ภาควิชากุมารเวชศาสตร์ คณะแพทยศาสตร์ มหาวิทยาลัยเชียงใหม่ ทราบ เพื่อจะได้นำไปใช้ประโยชน์ในการดูแลคนไข้ต่อไป

จึงเรียนมาเพื่อทราบ.

ขอแสดงความนับถือ


 (อาจารย์ นายแพทย์เปี่ยม วิชาญศิริ)

งานบริหารและธุรการ
เชียงใหม่ โทร. ๐ ๕๓๔๔ ๕๑๓๕, ๐ ๕๓๔๔ ๕๒๒๕
โทรสาร ๐ ๕๓๔๔ ๖๒๒๓

รองศาสตราจารย์ เปี่ยมวิชาญกรม
คณบดีคณะแพทยศาสตร์



เอกสารเลขที่ 113/2546

เอกสารรับรองโครงการวิจัยในมนุษย์

ชื่อคณะกรรมการจริยธรรมการวิจัย : คณะกรรมการจริยธรรมการวิจัย คณะแพทยศาสตร์ มหาวิทยาลัยเชียงใหม่

ที่อยู่ : 110 ถนนเชียงใหม่ 50 ถนนสุรินทโรจน์ อำเภอเมือง จังหวัดเชียงใหม่ 50200

ชื่อหัวหน้าโครงการวิจัย : นางสาวณัฏฐพร พะยอม

สังกัด : ภาควิชาพยาธิวิทยา คณะแพทยศาสตร์ โรงพยาบาลรามาธิบดี มหาวิทยาลัยมหิดล

ชื่อเรื่องโครงการวิจัย : ผลของการพยาบาลระบบสนับสนุนและให้ความรู้แก่มารดาต่อการคลอดก่อนกำหนดต่อพฤติกรรม ดูแลตนเองมารดาและผลลัพธ์สุขภาพของทารกภายหลังจำหน่ายออกจากโรงพยาบาล	
เอกสารที่รับรอง	เอกสารอ้างอิง (เอกสารอ้างอิง, หรือ วันที่อ้างอิง/ฉบับที่, วันที่)
โครงการวิจัย	หนังสือที่ ทม 0604(6)/864 ลงวันที่ 10 กุมภาพันธ์ 2546
ส่วนปรับปรุงแก้ไขโครงการวิจัย	-
หนังสือแสดงความยินยอม	หนังสือที่ ทม 0604(6)/864 ลงวันที่ 10 กุมภาพันธ์ 2546
เอกสารคู่มือผู้วิจัย	-
ประวัติส่วนตัวหัวหน้าโครงการ	อยู่ในโครงการวิจัย
รายละเอียดทางด้านงบประมาณ ค่าใช้จ่ายให้กับอาสาสมัคร, ค่าใช้จ่ายอื่น ๆ	-
เอกสารประชาสัมพันธ์ : (ถ้ามี)	-
อื่น ๆ	-

กระบวนการพิจารณาโครงการวิจัย : ☐ ในที่ประชุมคณะกรรมการ☒ เร่งพิเศษ (Expedited Review)

ผลการพิจารณา

คณะกรรมการจริยธรรมการวิจัย ได้พิจารณาแล้ว เห็นว่าโครงการฯ ดังกล่าว ไม่ขัดต่อสวัสดิภาพ และไม่ก่อให้เกิดอันตรายแก่ผู้ถูกวิจัยแต่ประการใด

จึงเห็นสมควรให้ดำเนินการวิจัยในขอบเขต ที่เสนอได้

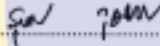
อนุมัติ ณ วันที่ 1๑ เดือน มิถุนายน พ.ศ. 25๕6 มีผลถึงวันที่ 1๑ เดือน ธันวาคม พ.ศ. 25๕6

คำแนะนำ :

- การเปลี่ยนแปลงส่วนใด ๆ ในโครงการวิจัย ต้องจัดทำส่วนปรับปรุงแก้ไขโครงการวิจัย (Amendment) เพื่อขอรับรองจากคณะกรรมการจริยธรรมการวิจัย
- เมื่อเสร็จสิ้นโครงการวิจัย ต้องสรุปผลการวิจัยแจ้งคณะกรรมการจริยธรรมการวิจัย

ลงชื่อ :  (ศาสตราจารย์นายแพทย์กำพล กลั่นกลิ่น)

ประธานคณะกรรมการจริยธรรมการวิจัย

ลงชื่อ :  (ศาสตราจารย์นายแพทย์สุพจน์ วุฒิการณ)

คณบดีคณะแพทยศาสตร์ มหาวิทยาลัยเชียงใหม่

**หนังสือยินยอมโดยได้รับการบอกกล่าวและเต็มใจ
(Information Consent Form)**

การวิจัยเรื่อง ผลของการพยาบาลระบบสนับสนุนและให้ความรู้แก่มารดาทารกคลอดก่อนกำหนดต่อพฤติกรรมการดูแลของมารดาและผลลัพธ์สุขภาพของทารกภายหลังจำหน่ายออกจากโรงพยาบาล

วันที่ให้คำยินยอม วันที่.....เดือน.....พ.ศ.....

ก่อนที่จะลงนามในใบยินยอมให้ทำการวิจัยนี้ ข้าพเจ้าได้รับการอธิบายจากผู้วิจัยถึงวัตถุประสงค์ของการวิจัย วิธีการวิจัย รวมทั้งประโยชน์ที่จะเกิดขึ้นจากการวิจัยอย่างละเอียด และมีความเข้าใจดีแล้ว

ผู้วิจัยรับรองว่าจะตอบคำถามต่างๆ ที่ข้าพเจ้าสงสัยด้วยความเต็มใจ ไม่ปิดบังซ่อนเร้น จนข้าพเจ้าพอใจ

ข้าพเจ้ามีสิทธิที่จะบอกเลิกการเข้าร่วมวิจัยนี้เมื่อใดก็ได้ และเข้าร่วมโครงการวิจัยนี้โดยสมัครใจและการบอกเลิกการเข้าร่วมการวิจัยนี้ จะไม่มีผลต่อการรักษาโรคที่บุตรข้าพเจ้าพึงได้รับต่อไป

ผู้วิจัยรับรองว่าจะเก็บข้อมูลเฉพาะเกี่ยวกับตัวข้าพเจ้าและบุตรเป็นความลับ และจะเปิดเผยได้เฉพาะในรูปที่เป็นการสรุปผลการวิจัย การเปิดเผยข้อมูลเกี่ยวกับตัวข้าพเจ้าและบุตรต่อหน่วยงานต่างๆ ที่เกี่ยวข้อง กระทำได้เฉพาะกรณีจำเป็นด้วยเหตุผลทางวิชาการเท่านั้น

ผู้วิจัยรับรองว่าหากมีข้อมูลเพิ่มเติมที่ส่งผลกระทบต่อการศึกษา ข้าพเจ้าจะได้รับการแจ้งให้ทราบโดยไม่ปิดบัง ซ่อนเร้น

ข้าพเจ้าได้อ่านข้อความข้างต้นแล้ว และมีความเข้าใจดีทุกประการ และได้ลงนามในใบยินยอมนี้ด้วยความเต็มใจ

ลงนาม.....ผู้ยินยอม

ลงนาม.....พยาน

ลงนาม.....พยาน

ข้อมูลสำหรับมารดาทารกคลอดก่อนกำหนด (Information Sheet)

ชื่อโครงการศึกษาวิจัย : การศึกษาติดตามผลของการพยาบาลระบบการสนับสนุนและให้ความรู้แก่มารดาทารกคลอดก่อนกำหนดต่อพฤติกรรมการดูแลของมารดาและผลลัพธ์สุขภาพทารกภายหลังจำหน่ายออกจากโรงพยาบาล ระหว่างมารดาทารกคลอดก่อนกำหนดที่ได้รับการพยาบาลตามปกติจากโรงพยาบาลมหาวิทยาลัยราชภัฏเชียงใหม่กับมารดาทารกคลอดก่อนกำหนดที่ได้รับการพยาบาลระบบสนับสนุนและให้ความรู้

ท่านมีบุตรเป็นทารกคลอดก่อนกำหนด จึงขอเชิญท่านเข้าร่วมการศึกษานี้ เพื่อเป็นแนวทางในการปรับปรุงคุณภาพการพยาบาลให้เหมาะสมและมีประสิทธิภาพยิ่งขึ้น ท่านจะได้มีโอกาสและเวลาอ่านข้อมูลข้างล่างนี้ก่อน หากท่านมีข้อข้องใจใดๆ เกี่ยวกับการศึกษานี้ และสิทธิของท่าน กรุณาซักถามจากผู้วิจัย ซึ่งจะเป็นผู้ให้ความกระจ่างแก่ท่าน นอกจากนี้ท่านจะได้รับเอกสารข้อมูลสำหรับ ผู้เข้าร่วมการศึกษานี้ หากท่านตัดสินใจเข้าร่วมการศึกษา ท่านจะได้รับสำเนาใบยินยอมที่ท่านเซ็นชื่อกำกับไว้ 1 ฉบับ ดิฉันรู้สึกยินดีที่ท่านได้ใช้เวลาอ่านข้อมูลดังต่อไปนี้

การศึกษานี้เกี่ยวกับเรื่องอะไร

การวิจัยครั้งนี้เป็นการวิจัยเรื่อง การพยาบาลระบบสนับสนุนและให้ความรู้เป็นระบบการพยาบาลที่พัฒนาขึ้นเพื่อเตรียมมารดาทารกคลอดก่อนกำหนดก่อนกลับไปดูแลทารกที่บ้านเพื่อเป็นแนวทางในการปรับปรุงคุณภาพการพยาบาลให้เหมาะสมและมีประสิทธิภาพยิ่งขึ้น ดิฉันจึงใคร่ศึกษาติดตามผลของการพยาบาลระบบนี้ซึ่งประกอบด้วย การให้มารดาได้ศึกษาการดูแลทารกคลอดก่อนกำหนดจากคอมพิวเตอร์ช่วยสอนเรื่องการดูแลทารกคลอดก่อนกำหนด การฝึกปฏิบัติการดูแลทารก การได้รับคู่มือการดูแลทารกคลอดก่อนกำหนดก่อนกลับบ้าน การได้รับการติดตามเยี่ยมบ้านหลังจากจำหน่ายออกจากโรงพยาบาลหนึ่งสัปดาห์ และการให้คำแนะนำทางโทรศัพท์อย่างเป็นระบบ โดยจะศึกษาเปรียบเทียบในมารดา 2 กลุ่ม กลุ่มละ 20 คน รวมเป็น 40 คน โดยมารดาในกลุ่มที่ 1 จะได้รับการดูแลจากพยาบาลและเจ้าหน้าที่ที่ทีมสุขภาพของโรงพยาบาลตามปกติทุกอย่างและมารดาในกลุ่มที่ 2 จะได้รับการดูแลจากพยาบาลและเจ้าหน้าที่ที่ทีมสุขภาพของโรงพยาบาลตามปกติและได้รับการพยาบาลระบบสนับสนุนเพิ่มเติมการที่ท่านจะได้รับการจัดให้อยู่ในกลุ่มที่ 1 หรือกลุ่มที่ 2 ขึ้นอยู่กับระยะเวลาที่ท่านมาติดต่อกับโรงพยาบาล

ท่านจะได้ประโยชน์อะไรจากการศึกษานี้

ท่านไม่ต้องเสียค่าใช้จ่ายใดๆ ทั้งสิ้นในการเข้าร่วมโครงการวิจัยนี้ ผลจากการเข้าร่วมการศึกษานี้จะเป็นประโยชน์ต่อการพัฒนาปรับปรุงคุณภาพการพยาบาลที่จะมีต่อมารดาทารกคลอด

**ข้อมูลสำหรับมารดาทารกคลอดก่อนกำหนด
(Information Sheet) (continued)**

ก่อนกำหนดต่อไป การศึกษาครั้งนี้ไม่มีค่าตอบแทนให้ท่านเนื่องจากว่าเป็นโครงการเพื่อการศึกษาและพัฒนาความรู้ทางด้านวิชาชีพการพยาบาล

ท่านจะต้องปฏิบัติตัวอย่างไร

ท่านจะถูกขอร้องให้เซ็นใบยินยอมแสดงว่าท่านตกลงด้วยความสมัครใจที่จะเข้าร่วมการศึกษาครั้งนี้ ท่านจะได้รับการขอความร่วมมือในการตอบแบบสอบถามเกี่ยวกับข้อมูลส่วนบุคคล เมื่อท่านกลับไปแลบุตรที่บ้านท่านจะได้รับแบบบันทึกพฤติกรรมทารกที่จะขอความร่วมมือท่านในการบันทึกพฤติกรรมทารก การนอน การร้องไห้ของทารกก่อนนำทารกมาตรวจตามนัด 2 วันและแบบบันทึกภาวะสุขภาพของทารกระหว่างอยู่ที่บ้านตลอดระยะเวลา 1 เดือนไปบันทึกและเมื่อแพทย์นัดให้นำบุตรมาตรวจตามนัดที่คลินิกพิเศษ ท่านจะได้รับการขอความร่วมมือในการตอบแบบสอบถาม พฤติกรรมการดูแลทารกคลอดก่อนกำหนดภายหลังจำหน่ายออกจากโรงพยาบาลและแบบบันทึก ผลลัพธ์สุขภาพ ซึ่งอาจจะเป็นการรบกวนเวลาท่านในการตอบแบบสอบถามและการบันทึกครั้งนี้ สำหรับบุตรของท่านจะได้รับการประเมินการเจริญเติบโต โดยการชั่งน้ำหนัก วัดความยาวลำตัวและวัดความยาวเส้นรอบศีรษะก่อนออกจากโรงพยาบาลและเมื่อมาตรวจตามนัดที่คลินิกเด็กพิเศษ

ในกรณีที่ท่านได้รับการจัดให้อยู่ในกลุ่มที่ 2 ท่านอาจจะต้องใช้เวลาในการดูแลคอมพิวเตอร์ช่วยสอนในเรื่องการดูแลทารกคลอดก่อนกำหนดในช่วงที่มาเยี่ยมบุตรที่โรงพยาบาล ซึ่งอาจทำให้ท่านเสียเวลาแต่ท่านจะได้รับความรู้เกี่ยวกับการดูแลทารกคลอดก่อนกำหนดทั้งหมด และเมื่อท่านกลับไปอยู่ที่บ้านท่านจะได้รับการติดตามเยี่ยมบ้าน 1 ครั้งภายหลังทารกได้รับการจำหน่ายจากโรงพยาบาลได้ 1

สัปดาห์ซึ่งอาจทำให้ท่านสูญเสียความเป็นส่วนตัวบ้าง รวมทั้งต้องใช้เวลาในการสนทนาหรือซักถามเกี่ยวกับอาการของทารกและปัญหาในการดูแลทารกของท่านรวมทั้งสิ้นประมาณไม่เกิน 1 ชั่วโมง

ท่านจะได้รับอันตรายจากการเข้าร่วมการศึกษาหรือไม่

ท่านและบุตรจะไม่ได้รับอันตรายใดๆทั้งสิ้นเนื่องจากว่าโครงการศึกษานี้ไม่ได้มีการทดลองใดๆ ที่ก่อให้เกิดอันตรายต่อท่านและบุตร

**ข้อมูลสำหรับมารดาทารกคลอดก่อนกำหนด
(Information Sheet) (continued)**

ท่านจะอย่างไรหากท่านไม่ต้องการเข้าร่วมการศึกษาหรือหากท่านเปลี่ยนใจระหว่างเข้าร่วมศึกษา การเข้าร่วมเข้าร่วมในการศึกษาจะเป็นไปตามความสมัครใจของท่าน หลังจากที่ท่านตัดสินใจเข้าร่วมการศึกษาแล้ว ท่านสามารถถอนตัวได้ตลอดเวลา การตัดสินใจของท่านจะไม่มีผลต่อการรักษาและการพยาบาลใดๆ ในอนาคตหรือการดูแลอื่นใดก็ตาม

การปกป้องรักษาข้อมูล : ข้อมูลใดบ้างที่จะถูกเก็บรวบรวมไว้จากการศึกษารั้งนี้ ข้อมูลส่วนตัวที่ท่านไม่ต้องการเปิดเผยจะถูกเก็บรวบรวมไว้เป็นความลับ และจะเปิดเผยเฉพาะในรูปที่เป็นสรุปผลการศึกษาทั้งนี้ด้วยเหตุผลทางวิชาการเท่านั้น

หากท่านมีคำถามเกี่ยวกับการศึกษานี้ท่านสามารถติดต่อใครได้บ้าง

ท่านสามารถติดต่อผู้วิจัยคือ นางสาวเนตรทอง ทะยา ได้ที่ ภาควิชาการพยาบาลกุมารเวชศาสตร์ คณะพยาบาลศาสตร์ มหาวิทยาลัยเชียงใหม่ โทรศัพท์ 053-945014 (ในเวลาราชการ) และ 09-631-3913 (ตลอดเวลา)



Part I: Computer Assisted Instruction (CAI)



Part II : The premature infant care handbook

คู่มือการดูแลทารกคลอดก่อนกำหนด



Part III : Telephone advice guideline of premature infant care for the neonatal nurses

แนวทางการให้คำแนะนำทางโทรศัพท์แก่มารดาทารกคลอดก่อนกำหนดสำหรับพยาบาล

ทารกแรกเกิด

คำชี้แจง คู่มือนี้มีวัตถุประสงค์เพื่อเป็นแนวทางในการให้คำแนะนำเมื่อมารดาทารกคลอดก่อนกำหนดที่มีปัญหาในการดูแลบุตรและปัญหาอื่นๆ โดยให้ผู้ให้คำแนะนำ ใช้แนวทางนี้ในการให้คำแนะนำ มารดา

หัวข้อคำถามจากมารดา	เนื้อหาการให้คำแนะนำ
1. การเจริญเติบโตและการ น้ำหนักตัว	- การเจริญเติบโตของทารกคลอดก่อนกำหนดที่น้ำหนักน้อยมาก (Very low birth weight) อาจใช้เวลาถึง 3-8 สัปดาห์ ระหว่างนี้อัตราการเจริญเติบโต (catch up growth) จะเท่ากับ 15-25 กรัม/วัน - น้ำหนักตัวจะเพิ่มอย่างรวดเร็วในช่วงปีแรก โดยอัตราการเพิ่มเฉลี่ย 20-30 กรัม/วัน
ความยาวลำตัว 	- ทารกคลอดก่อนกำหนดจะมีศีรษะโต ลำตัวยาว อัตราความยาวของร่างกายจะเพิ่มขึ้นช้าในสัปดาห์แรกหลังคลอด และในสัปดาห์ที่ 3 หลังคลอด ความยาวตัวทารกจะเพิ่มขึ้นประมาณ 0.8 เซนติเมตร/สัปดาห์ และจะเท่ากับทารกเกิดครบกำหนดเมื่ออายุประมาณ 2 ปี



Part I : The record form of health outcome of premature infant after hospital discharge

แบบบันทึกภาวะเจ็บป่วยของทารกคลอดก่อนกำหนดภายหลังจำหน่ายออกจากโรงพยาบาล
สำหรับมารดา

คำชี้แจง แบบบันทึกนี้เป็นแบบบันทึกภาวะเจ็บป่วยของบุตรท่านในขณะที่ท่านดูแลบุตรอยู่ที่บ้าน
ในระยะเวลา 1 เดือนหลังจำหน่ายออกจากโรงพยาบาล โดยให้ท่านบันทึก วันที่เกิดเหตุการณ์เจ็บ
ป่วยและการช่วยเหลือขั้นต้นในเหตุการณ์นั้นๆ

ชื่อทารก _____ เพศ ☐ ชาย ☐ หญิง

อาการเจ็บป่วย	ครั้งที่ 1/ วันที่	ครั้งที่ 2/ วันที่	ครั้งที่ 3/ วันที่	ครั้งที่ 4/ วันที่	ครั้งที่ 5/ วันที่	การช่วยเหลือขั้นต้น
1.ตาอักเสบ						
2.ฝ้าในปาก						
3.ท้องอืด						
4.						

Part II : The health outcomes record form of premature infant at an appointment date for the assistant research

แบบบันทึกผลลัพธ์สุขภาพของทารกคลอดก่อนกำหนดสำหรับผู้ช่วยวิจัย

ชื่อทารก..... อายุหลังคลอด.....วัน

การเจริญเติบโต

น้ำหนัก.....กรัม

ความยาว.....เซนติเมตร

เส้นรอบศีรษะ.....เซนติเมตร





Part I : The questionnaire of premature infant's and mother's demographic data

แบบสอบถามข้อมูลส่วนบุคคลของมารดาและทารกคลอดก่อนกำหนด

คำชี้แจง ให้ขีดเครื่องหมาย ✓ ลงในช่องว่าง () หรือเติมคำในช่องว่าง

ส่วนที่ 1 ข้อมูลทั่วไปของมารดา

1. อายุ.....ปี
2. จำนวนบุตรที่มีก่อน.....คน
3. สถานภาพสมรส
 () คู่ () ม่าย () หย่าร้าง หรือแยกกันอยู่
4. ระดับการศึกษาสูงสุด
 () ประถมศึกษา () มัธยมศึกษา
 () อาชีวศึกษา หรืออนุปริญญา () ปริญญาตรี
 () อื่นๆ ระบุ.....
5. อาชีพ
 () รับราชการ, รัฐวิสาหกิจ () ค้าขาย
 () เกษตรกรรม () รับจ้าง
 () แม่บ้าน () อื่นๆ ระบุ.....
6. รายได้ครอบครัวเฉลี่ยต่อเดือน.....บาท
7. ลักษณะของครอบครัว
 () ครอบครัวเดี่ยว
 () ครอบครัวขยาย มีสมาชิกที่อาศัยอยู่ร่วมกัน.....คน
 สมาชิกในครอบครัวที่จะช่วยดูแลบุตร ได้แก่.....
8. ประสบการณ์ในการดูแลทารก
 () เคย () ไม่เคย

แบบสอบถามข้อมูลส่วนบุคคลของมารดาและทารกคลอดก่อนกำหนด (ต่อ)

ส่วนที่ 2 ข้อมูลทั่วไปของทารก

1. เพศ

() ชาย

() หญิง

2. อายุในครรภ์.....สัปดาห์

3. น้ำหนักแรกเกิด.....กรัม

4. จำนวนวันที่เข้ารับการรักษาในโรงพยาบาล.....วัน

5. สภาพทารกในวันที่จำหน่ายจากโรงพยาบาล

อายุขณะจำหน่าย.....วัน อายุที่ปรับแล้ว.....สัปดาห์

น้ำหนัก.....กรัม

ความยาวลำตัว.....เซนติเมตร

ความยาวเส้นรอบศีรษะ.....เซนติเมตร

อาการทั่วไป.....

Part II : The maternal caregiving behavior questionnaire

แบบสอบถามพฤติกรรมมารดาในการดูแลทารกตลอดก่อนกำหนด

คำชี้แจงในการตอบแบบสอบถาม

ข้อความต่อไปนี้เป็นข้อความที่ท่านจะใช้บอกพฤติกรรมของตนเองในการดูแลทารกตลอดก่อนกำหนด ขอให้ท่านตอบให้ตรงกับกิจกรรมที่ท่านได้กระทำอย่างแท้จริงของท่านให้มากที่สุด คำตอบของท่านไม่มีถูกหรือผิด และไม่มีผลกระทบต่อการรักษาพยาบาลบุตรของท่าน

ขอให้ทำเครื่องหมาย ✓ ลงในช่องที่เห็นว่าตรงกับสิ่งที่ท่านได้ปฏิบัติมากที่สุด

การเลือกตอบให้ถี่ถ้วนดังนี้

ส่วนที่ 1

สม่ำเสมอ หมายถึง กิจกรรมที่ท่านทำสม่ำเสมอในการดูแลบุตรเมื่อเกิดเหตุการณ์
บ่อยครั้ง หมายถึง กิจกรรมที่ท่านทำ 2 ใน 3 ของจำนวนครั้งในการดูแลบุตรเมื่อเกิดเหตุการณ์
บางครั้ง หมายถึง กิจกรรมที่ท่านทำ 2 ใน 3 ของจำนวนครั้งในการดูแลบุตรเมื่อเกิดเหตุการณ์
ไม่ได้ทำ หมายถึง กิจกรรมที่ท่านไม่ได้ทำในการดูแลบุตรเมื่อเกิดเหตุการณ์

ข้อความ	พฤติกรรมมารดาในการดูแลทารกตลอดก่อนกำหนด				
	สม่ำเสมอ	บ่อยครั้ง	บางครั้ง	ไม่ได้ทำ	หมายเหตุ
1. เมื่อทารกหลับขณะดูนม ท่านปลุกทารกให้ตื่นมาดูนมต่อไป					
2. ท่านปลุกทารกให้ตื่นมาดูนมเมื่อทารกหลับนาน จนเลยมีอนม					
3.					

แบบสอบถามพฤติกรรมมารดาในการดูแลทารกคลอดก่อนกำหนด (ต่อ)

ส่วนที่ 2

ข้อความ	พฤติกรรมมารดาในการดูแลทารกคลอดก่อนกำหนด				
	ทุกวัน	20-29 ครั้ง/เดือน	1-19 ครั้ง/เดือน	ไม่ได้ทำ	หมายเหตุ
15. นอกจากนมมารดาหรือนมผสมแล้ว ท่านให้ทารกได้รับน้ำส้ม หรือ ก๋วยเตี๋ยว					
16. ท่านนำทารกไปซื้อของที่ห้างสรรพสินค้าหรืองานมงคลต่างๆที่อยู่นอกบ้าน					
17.					
18.					
19.					

24. ท่านได้รับคำแนะนำการดูแลทารกคลอดก่อนกำหนดจากที่ไหนบ้าง

APPENDIX F

List of expert for the premature infant care handbook, the telephone advice guideline, the maternal caregiving behavior questionnaire, the record form of health outcome of premature infant after hospital discharge.

1. Fongkum Tilokskulchai
Associate Professor
Faculty of Nursing (Siriraj), Mahidol University
2. Varaporn Chaiyawattana
Assistant Professor
Faculty of Nursing, Chulalongkorn University
3. Rujipas Phusawang
Assistant Professor
Faculty of Nursing, Chiang Mai University
4. Prissana Soonthornchai
Assistant Professor
Faculty of Nursing, Chiang Mai University
5. Wimonwan Warorarn
Head nurse of Neonatal Care Unit of Ramathibodi Hospital
Faculty of Medicine, Ramathibodi Hospital, Mahidol University
4. Pracha Nunnarhumitt
Instructor, Department of Pediatrics
Faculty of Medicine, Ramathibodi Hospital, Mahidol University

BIOGRAPHY

NAME	Miss. Nethong Taya
DATE OF BIRTH	5 June, 1971
PLACE OF BIRTH	Chiang Mai, Thailand
INSTITUTIONS ATTENDED	Chiang Mai University, 1990-1993 Bachelor of Nursing Science Mahidol University, 2001- 2004 Master of Nursing Science (Pediatric Nursing)
THESIS SUPPORTED FUND	Support in part by the Thesis Grant, Graduate Studies of Mahidol University Alumni Association, Mahidol University
POSITION AND OFFICE	Department of Pediatric Nursing, Faculty of Nursing , Chiang Mai University, 110 Intawaroros Road, Amphoe Mueng, Chiang Mai, Thailand 50200 Position : Lecturer TEL : (662) 0-5394-5014 Email: nethntaya@hotmail.com
HOME ADDRESS	100 Moo 4, Tambon Hnongkeaw, Hangdong district, Chiang Mai, Thailand 50230