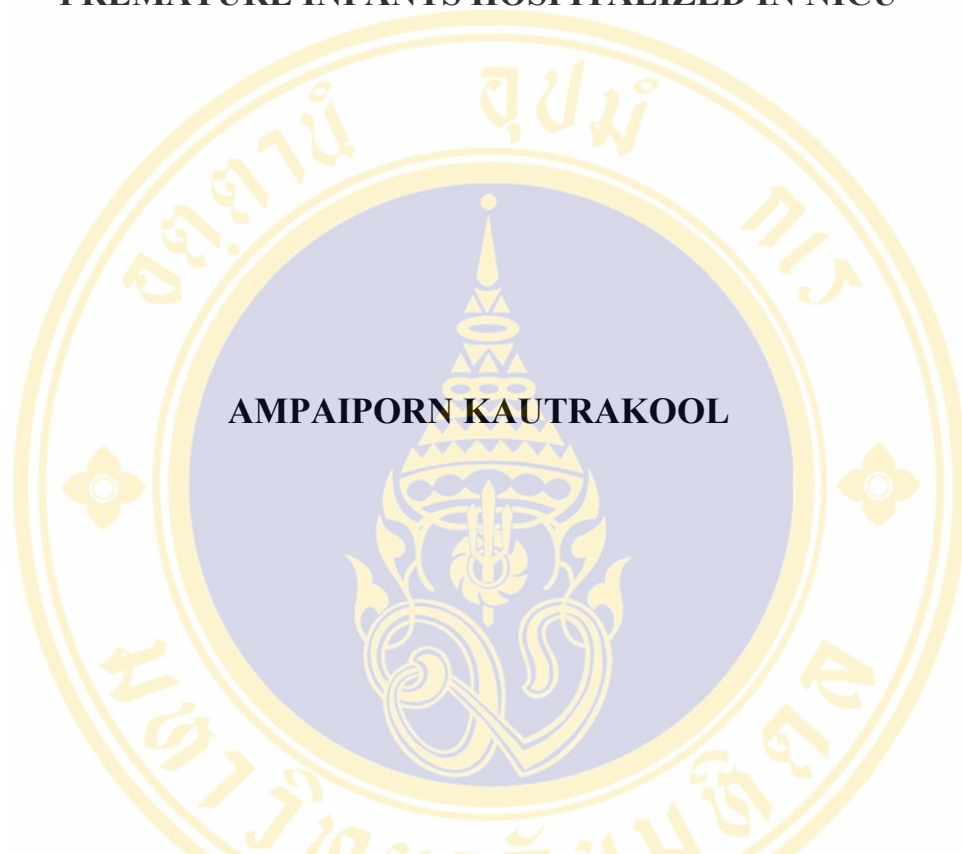


**STRESS, RELATED FACTORS, AND
COPING STRATEGIES OF MOTHERS OF
PREMATURE INFANTS HOSPITALIZED IN NICU**



**A THESIS SUBMITTED IN PARTIAL FULFILMENT
OF THE REQUIREMENTS FOR
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MAHIDOL UNIVERSITY
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entitled

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Ampaiporn Kautrakool
.....
Mrs Ampaiporn Kautrakool
Candidate

Yuwadee Luecha
.....
Assoc. Prof. Yuwadee Luecha, Ed.D.
Major-advisor

Renu Pookboonmee
.....
Asst. Prof. Renu Pookboonmee, D.N.S.
Co-advisor

M.R. Jisnuson Svasti
.....
Prof. M.R. Jisnuson Svasti, Ph.D
Dean
Faculty of Graduate Studies

Orasa Panpakdee
.....
Assoc. Prof. Orasa Panpakdee,
D.N.S.
Chair
Master of Nursing Science
Faculty of Medicine,
Ramathibodi Hospital

Thesis
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for the degree of Master of Nursing Science (Pediatric Nursing)
on October 6, 2005

Ampaiporn Kautrakool
.....
Mrs Ampaiporn Kautrakool
Candidate

Yuwadee Luecha
.....
Assoc. Prof. Yuwadee Luecha, Ed.D.
Chairperson

RENU POOKBOONMEE
.....
Asst. Prof. Renu Pookboonme, D.N.S.
Member

Nittaya Sinsuksai
.....
Assoc. Prof. Nittaya Sinsuksai
Ph.D (Nsg)
Member

Wantana Maneesriwongul
.....
Assoc. Prof. Wantana Maneesriwongul,
D.N.Sc.
Member

J. Svasti
.....
Prof. M.R. Jisnuson Svasti, Ph.D
Dean
Faculty of Graduate Studies
Mahidol University

Rajata Rajatanavin
.....
Rajata Rajatanavin, M.D., F.A.C.E.
Professor of Medicine,
Dean, Faculty of Medicine
Ramathibodi Hospital,
Mahidol University.

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Ampaiporn Kautrakool

**STRESS, RELATED FACTORS, AND COPING STRATEGIES OF
MOTHERS OF PREMATURE INFANTS HOSPITALIZED IN NICU****AMPAIPORN KAUTRAKOOL 4336840 RAPN/M****M.N.S. (PEDIATRIC NURSING)****THESIS ADVISORS: YUWADEE LUECHA, Ed.D., RENU
POOKBOONMEE, D.N.S****ABSTRACT**

This descriptive study aimed to describe maternal stress, relationships between maternal stress and maternal age, maternal education, family income, and perceived infant's illness severity, coping strategies and their perceived effectiveness of mothers of premature infants hospitalized in NICU.

The purposive samples were 60 mothers recruited from Hatyai and Songklanagarind Hospital in Songkhla province, Thailand. Data were collected in a six-month period from February to July 2005. The questionnaires used in this study were Maternal Demographic Characteristics Form, Perceived Infant's Illness Severity Scale, Infant Clinical Data Form, The Parental Stressor Scale (PSS: NICU), and The Thai Coping Scale. Data were analyzed with the SPSS/FW Program by using descriptive statistics, Pearson's correlation coefficients, and Spearman's rho correlation coefficients.

The mean scores for maternal stress were at a moderate level. Maternal stress was significantly and positively correlated with perceived infant's illness severity ($r=.306$, $p<.01$). All items of problem-focused coping strategies were performed and the mean scores of perceived effectiveness to lower stress were at a moderate level. Trying to seek information about infant's illness and treatment from nurses firstly, and secondly, doctors were the two most frequently performed problem-focused coping strategies, and subjects perceived them as the most effective way to lower stress. Mothers perceived that two-thirds of the emotional-focus coping strategies they performed were effective to lower stress at a moderate level. The most frequently performed strategy was that they always maintain hope infant's illness would improve in the future and subjects perceived this as the most effective way to lower stress.

This study provides guidelines for nurses as key persons to assess maternal stress and help to find out proper coping strategies by giving clear, appropriate information and emotional support to mothers of premature infants hospitalized in NICU.

**KEY WORDS: STRESS/ STRESS RELATED FACTORS/ COPING STRATEGIES/
PREMATURE INFANTS / NICU**

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ความเครียด ปัจจัยที่เกี่ยวข้อง และกลวิธีเผชิญความเครียดของมารดาทารกเกิดก่อนกำหนดที่เข้ารับการรักษาในหออภิบาลทารกแรกเกิด (STRESS, RELATED FACTORS, AND COPING STRATEGIES OF MOTHERS OF PREMATURE INFANTS HOSPITALIZED IN NICU)

อำเภอพร ก่อตระกูล 4336840 RAPN/M

พย.ม. (การพยาบาลเด็ก)

คณะกรรมการควบคุมวิทยานิพนธ์: ยูติ ภาษา Ed.D, เรณู พุกบุญมี D.N.S.

บทคัดย่อ

การวิจัยเชิงพรรณานี้มีวัตถุประสงค์เพื่อศึกษาความเครียด ความสัมพันธ์ระหว่างความเครียดกับอายุ ระดับการศึกษาของมารดา รายได้ของครอบครัว และการรับรู้ความรุนแรงของความเจ็บป่วยของทารก และศึกษากลวิธีการเผชิญความเครียดและการรับรู้ประสิทธิภาพของกลวิธีการเผชิญความเครียดของมารดาทารกเกิดก่อนกำหนดที่เข้ารับการรักษาในหออภิบาลทารกแรกเกิด กลุ่มตัวอย่างเป็นมารดาทารกเกิดก่อนกำหนดที่เข้ารับการรักษาในหออภิบาลทารกแรกเกิด โรงพยาบาลหาดใหญ่ และโรงพยาบาลสงขลานครินทร์ จังหวัดสงขลา จำนวน 60 คน เก็บรวบรวมข้อมูลในช่วงเดือนกุมภาพันธ์ถึงเดือนกรกฎาคม พ.ศ. 2548 โดยใช้แบบสอบถามข้อมูลส่วนบุคคลของมารดาและทารก แบบสอบถามความเครียดของมารดา แบบสอบถามกลวิธีเผชิญความเครียดและประสิทธิภาพของกลวิธีนั้นๆ วิเคราะห์ข้อมูลโดยใช้สถิติบรรยายและสถิติสัมพันธ์สหสัมพันธ์แบบเพียร์สันและสเปียร์แมน โร

ผลการวิจัยพบว่า มารดามีความเครียดในระดับปานกลาง และความเครียดมีความสัมพันธ์ทางบวกกับการรับรู้ความรุนแรงของความเจ็บป่วยของทารกอย่างมีระดับนัยสำคัญทางสถิติ ($r = .306, p < .01$) มารดาทราบว่ากลวิธีเผชิญความเครียดแบบมุ่งจัดการกับปัญหาทั้งหมดช่วยลดความเครียดได้ในระดับปานกลาง โดยกลวิธีที่มารดาใช้มากที่สุดและรับรู้ว่ามีประสิทธิภาพสูงสุด คือการซักถามอาการของบุตรจากพยาบาลและแพทย์ มารดาทราบว่า 2 ใน 3 ของกลวิธีการเผชิญความเครียดแบบมุ่งจัดการกับอารมณ์ ช่วยลดความเครียดได้ในระดับปานกลาง โดยกลวิธีที่มารดาใช้มากที่สุดและรับรู้ว่ามีประสิทธิภาพสูงสุด คือ การตั้งความหวังว่าลูกจะมีอาการดีขึ้นในไม่ช้า

ผลการศึกษานี้ เป็นแนวทางสำหรับพยาบาล ซึ่งเป็นบุคคลที่มีบทบาทสำคัญในการประเมินความเครียดและช่วยเหลือมารดาในการปรับตัวกับความเครียด โดยการให้ข้อมูลที่ชัดเจนและเหมาะสม และช่วยประดับประดาความรู้สึกแก่มารดาทารกเกิดก่อนกำหนดที่เข้ารับการรักษาในหออภิบาลทารกแรกเกิด

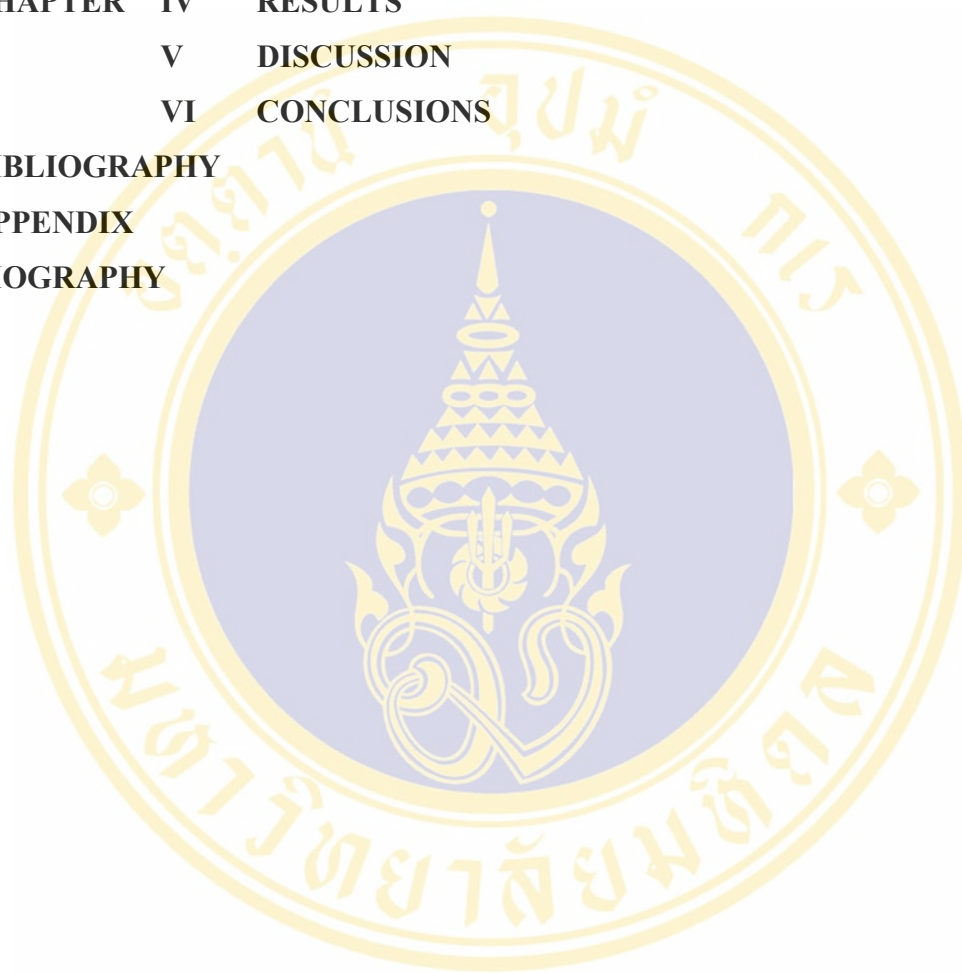
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CONTENTS

	Page
ACKNOWLEDGEMENT	iii
ABSTRACT (ENGLISH)	iv
ABSTRACT (THAI)	v
LIST OF TABLES	viii
LIST OF FIGURE	ix
CHAPTER I INTRODUCTION	
Background and rationale	1
Conceptual framework	6
Research questions	9
Objectives of the study	9
Research hypothesis	10
Scope of the study	10
Significance of the study	10
Definition of terms	10
II LITERATURE REVIEW	
Premature infant in NICU	12
Stress and coping	19
Maternal stress and related factors	27
Maternal coping strategies	35
III MATERIALS AND METHODS	
Population and samples	39
Setting	40
Instruments	41
Protection of human rights	47
Data collection	48
Data analysis	48

CONTENTS (Continued)

	Page
CHAPTER IV RESULTS	52
V DISCUSSION	63
VI CONCLUSIONS	75
BIBLIOGRAPHY	78
APPENDIX	84
BIOGRAPHY	98



LIST OF TABLES

	Page
Table 1. Maternal demographic characteristics	51
Table 2. Infant clinical data	54
Table 3. Possible range, actual range, means, standard deviations, and level of maternal stress scores	55
Table 4. Pearson correlation coefficients between maternal stress and maternal age, and perceived infant's illness severity	55
Table 5. Spearman's rho correlation coefficients between maternal stress and family income, and maternal education	56
Table 6. Frequencies and percents of problem-focused coping strategies and their perceived effectiveness of mothers of premature infants hospitalized in NICU, ranking from the highest effectiveness	57
Table 7. Frequencies and percents of emotional-focused coping strategies and their perceived effectiveness of mothers of premature infants hospitalized in NICU, ranking from the highest effectiveness	59

LIST OF FIGURES

	Page
Figure 1. Conceptual framework for this study	9



CHAPTER I

INTRODUCTION

Background and Rationale

While women are pregnant, stress should be minimized to the best of their ability (www.pennhealth.com, 23 Sep 2005). A number of studies have suggested that high levels of stress may contribute to pregnancy complications like premature labor and low birth weight (www.marchofdimess.com). Infants who are delivered prematurely are at risk of various problems, which complicate their immediate neonatal and subsequent development (Lau, 2001: 11). As a group, they have a greater incidence of developmental delays than do full-term infants (Affleck, et al., 1991; Greenburg & Crnic, 1988; Klien, et al., 1985. cited by Reichman, et al, 2000: 279). The lower the birth weight and the more medically complicated the infant's hospital course is at birth, the greater the likelihood of problems such as difficulty in school, neurodevelopment abnormalities, and handicapping conditions (Reichman, et al., 2000: 280). From the statistics of Songklanagarind Hospital in 2001-2003, there were an increasing number of premature births from 16.33%, to 21.48%, and 27.06% respectively in comparison with total births (Statistical and Microfilm Unit, 2004).

Giving birth to a premature infant during the second trimester results in the loss of opportunities to prepare mentally for the motherhood (Lau, 2001: 49-50). Mothers of premature infants are perceived losses from early, abrupt termination of pregnancy; feelings of guilt or failure about the inability to carry the pregnancy to term (Affonso, et al., 1992: 63). Because of the physiologic instability, preterm infants are immediately separation from their mothers and surrounded by a complex, impenetrable barrier of glass windows, mechanical equipment, and special caregivers (Wong, 2003: 366) in the highly technical and critical care environment of neonatal intensive care unit (NICU) (John,1983; Periman, 1986 cited by Hughes, et al., 1994: 1; Pinelli, 2000: 27). During the postnatal period, mothers continue to expand their maternal identity in relation to the infant's growth and this may be difficult as a premature infant differs from the full

term infant in appearance and behavior (Rubin, 1984 cited by Lau, 2001: 48), and the NICU environment is not private enough.

Many studies reported that the most stressful aspects of the NICU experience are infant's illness, appearance and treatments, and parental fear about outcome; and alterations in the parental role (Affonso, et al., 1992: 66-69; Holditch-Davis & Miles, 2000: 15-17; Lau, 2001: 92-94; Wereszczak, et al., 1997: 35-37). On the first visit, the highly technical nature of the NICU environment may exacerbate maternal anxiety (Johnson, 1983; Perlman, 1986 cited by Hughes, et al., 1994: 1). Monitors are beeping and lights are flashing all over. It can be overwhelming because mothers do not understand what those mean. It looks very frightening. They may be panic and overreact to everything (<http://www.chw.org>: 23 Sep 2005).

Seeing her infant at the first time, mother is often shocked by the newborn's tiny size and fragile appearance surrounded by countless tube, medical equipment, and/or machine in an unfamiliar environment (Pinelli, 2000: 27; Wereszczak, et al, 1997: 33). The premature infant looks different from term infant in many ways including the weight and proportion of the body and the length of the trunk in proportion to the limbs. They are very small and appear scrawny. The head of the premature infant looks large. The skin appears ruddy because of its translucence and the lack of fat layer between the skin and the blood vessels. This lack of a fatty layer makes the infant appear wrinkled (O'Brien, et al., 1995; Schreiner, 1988 cited by Lau, 2001: 49). Many premature infants less than 32 week's gestation have poor muscle tone and the legs are floppy and extended. This hypotonicity and combined immature central nervous system means that the premature infants have little control over their movements and they startle easily and their limbs may tremble. Therefore mothers are often frightened when they see these movements. The differences in activity and neurological responses are also apparent in the immature infant, as the premature infants have a low level of alertness and spontaneous activity. The greater the immaturity of the infant the less general activity he/she shows (Field, 1987; Goldberg & DiVitto, 1983 cited by Prudhoe & Peters, 1995: 140; Lau, 2001: 49-50; Wong, 2003: 376). These characteristics of the premature infants require that, for many mothers, they must work harder to achieve less satisfying interactions with their babies. Mother is also threatened by painful procedures infant has to undergo.

Bruises, cuts, or abrasions all over his/her body is another major stressor to mother. So it is understandable that the appearance and behavior of the premature infant may contribute to the mothers' perceived loss of a healthy term infant.

The birth of a premature infant deprives mothers of early contact experiences to be alone with their newborn immediately after the delivery (Lau, 2001: 49-50). The separation from their infants was identified by most mothers as the most difficult aspect of the hospitalization. Mothers are distressed by the loss of their expected maternal role with their newborn because of interruption of the family's normal activities and her maternal responsibilities due to prolonged separation from the infant. Miles and associates' study reported that mothers were moderately high stress associated with the alteration in their parental role (Miles, et al., 2002: 85-86). The mothers found it troubling that they were unable to participate more in the care and nurturing of their infant, for example, holding, feeding, and bathing the baby. The loss of maternal role particularly affected the ability to advocate and make decisions for their infants (Affonso, et al., 1992: 66-68; Beckman & Pokorni, 1988; Boukydis, et al., 1987 cited by Prudhoe & Peters, 1995: 140; Brunssen & Miles, 1996: 88; Holditch-Davis & Miles, 2000: 16-18; Hughes, et al., 1994: 6-8; McCluskey-Fawett, et al., 1992 cited by Lau, 2001: 49-50; Miles, et al., 2002: 86). Moreover, age and socioeconomic status provide a context for parental interpretation of the NICU experience and may also directly cause stress (Holditch-Davis & Miles, 2000: 14).

Persons with different ages do not perceive stress in the same way according to the developmental maturity (Gazde, 1971, Lazarus, 1996; Vaillant, 1971 cited by Garland & Bush, 1982: 11). Studies that compared maternal stress between adolescent and adult mothers shown that younger mothers rated the stressfulness in their lives as higher than did older mothers and reported an inability to deal with the stress (Garcia-Coll, et al., 1987; Levine, et al., 1985; Schinke, et al., 1986 cited by Christopher, et al., 2000: 289). Additional finding was that in the NICU, younger mothers experienced higher levels of stress than did older mothers, and general psychological distress was best predicted by younger maternal age. Whereas, another report revealed that older mothers reported greater stress scores, the more highly educated mothers also had higher perceived morbidity scores (Shield-Poe & Pinelli, 1997: 34-35).

Personal capability to access and understand information depends on their knowledge which may be related to individual's educated duration. Education allows human beings to have full growth of intelligence and knowledge (Subbamma, 1985: 27), which results in better perception of information about health and illness. The high-educated person had better chance to obtain information than the low-educated did (Pender, 1987: 161-162; Whetstone, et al., 1986: 967). Moreover, financial support is another factor related to maternal stress. Many studies found that economic hardship may be added stressors when a child is sick (Dickerson, 1995; McCloyd, 1990; Wilson 1991 cited by Miles, et al., 2002: 83). Family have to pay more for high expenses for NICU cost, a trip fare to and from the hospital and home, and the living expense during the infant visit. A family with higher income than expense will exhibit lower stress than that with lowers one (Chaisom, P., 1993: 30). Severity of illness related to parental stress has also been documented. Uncertainty of infant's health status and severity of infant's illness causes a great deal of maternal stress and anxiety (Affonso, et al., 1992: 68; Brunssen & Miles, 1996: 88; Catlett, et al., 1994:45-49; Holditch-Davis & Miles, 2000: 17; Hughes, et al., 1994: 6; Miles, et al., 2002: 86; Shields-Poe & Pinelli, 1997: 36; Wereszczak, et al., 1997: 36).

Evidence suggests that stress has harmful effects on many aspect of family functioning, including life satisfaction, attitudes, and interactions with the child (Crnic, et al., 1983 cited by Prudhoe & Peters, 1995: 141). As a result, mothers may experience symptoms of psychological distress (LaMontagne, et. al, 1995: 212; Miles, et al., 2002: 82; Young-Seideman, et al, 1997: 169; Tichy, et al., 1988: 40-42). Blackburn & Lowen (1986 cited by Affonso, et.al., 1992: 64) found that the greatest stress intensity was attributed to emotional distress (specifically feelings anxiety and fear), follow by disappointment, lack of control, and helplessness. Holditch-Davis and colleagues (2003: 165–171) studied in posttraumatic stress symptoms in mothers of premature infants hospitalized in NICU. The result shown that mothers of premature infants appeared to be experiencing emotional responses similar to posttraumatic stress reactions at 6 months after their child's expected birth date. These mothers continue to have these emotional responses for more than 6 months after hospital discharge (Brooten, et al., 1988: 213-216; Miles, et al., 1999; cited by Holditch-Davis, et al., 2003: 162; Reichman, et al., 2000: 285) and to have distressing memories of the birth

and NICU for at least 3 years (Affleck, et al., 1990: 12-25; Miles & Holditch-Davis, 1995 cited by Holditch-Davis, et al., 2003: 167). A common symptom of these mothers was increased arousal. Similar responses have been described in other studies of mothers of premature infants after their hospital discharge (Affonso, et al., 1992: 63-70; Holditch-Davis, et al., 2003: 161-171; LaMontagne, et. al., 1995: 212-213; Miles, et al., 2002: 82-88; Wereszczak et al, 1997: 35-36). High distress might contribute to overprotection, overindulgence, and a failure to provide age-appropriate limits. These mothers are highly vigilant and overprotective of prematurely born children, even in the preschool period (Miles & Holditch-Davis, 1995; O'Mara & Johnston, 1989 cited by Holditch-Davis, et al., 2003: 167) and have higher anxiety levels than mothers of full-term children (Brooten, et al., 1988: 213-216; Gennaro, et al., 1990 cited by Holditch-Davis, et al., 2003: 167).

The type of stress experiences depends on how the situation is viewed by the person in terms of its relevance for one's well-being and the resources available to manage the event (Folkman, 1984: 840). There is an empirical support regarding what aspects of the critical care situation produces parental stress, and the ways parents cope during the NICU experience. Studies focused on parental coping during a child's critical care hospitalization showed that parents used a variety of coping strategies that focus on problem solving as well as emotional responses to the situation (LaMontagne, et al., 1992; Miles & Carter, 1985 cited by LaMontagne, et. al., 1995: 212-213; LaMontagne & Pawlak, 1990: 416-421). LaMontagne and colleague's study (1992 cited by LaMontagne, et. al., 1995: 212-213) further shown that older, more self-directed, less anxious parents used more problem-focused coping strategies and fewer strategies that focus on their emotional responses to the event. Affleck and associates (1991 cited by Hughes, et al, 1994: 2) also found that mothers typically used a combination of coping strategies, with the highest proportion seeking social support and looking for meaningfulness in the NICU experience. Similarly, Miles and colleagues (1996: 45-51) found that highest source of support for parents of children in NICU were the other parent. Other important sources of support included NICU nurses and physicians and the child's grandparents.

Most studies about stress and coping conducted in the area of caregiver of adult patients (Aldwin, 1991: 174-180; Collins, et al., 1996: 4-12; Crumlish, 1994: 57-68;

Gass & Chang, 1989: 31-36; Lok, 1996: 873-881; Neundorfer, 1991: 260-265; Sirapoh-ngam, Y., 1994: 75-85. Thummathai, K., 2001: 49-67; Yeh, et al., 1994: 106-111). In the area of pediatric nursing in Thailand, Chaisom, P. (1993: 45-81) studied stress and coping strategies of parents of children in PICU. The results showed that parents experienced moderate stress. The child's behavior was the most significant stressor for parents. The reframing family problem was the most frequently used coping strategies and the least frequently used strategy was the neighbor resource. Although anecdotal and empirical evidence suggests that NICU hospitalization is a period of significant parental stress, and there has been much information about this conducted in western context, little is known about how mothers cope with premature infants' illness especially during the first week of their premature infant's hospitalization in NICU. Yamanantakul, P. (1995: 44-58) studied the relationship between stress level, coping behavior and related factors of mothers of premature babies admitted to NICUs. The results showed that infants' appearance, the NICU environment and atmosphere, staff communication and behavior, maternal role inadequacy, and finance were the stressors for the mothers of premature babies. Maternal role inadequacy was the most significant stressor. Mother had moderate stress levels and used problem-focused coping more than emotional-focused coping. There was a significantly high positive correlation between stress levels and problem-focused coping. However, there was no significant difference in coping behavior among mothers of premature babies at different ages, incomes, and birth orders. Consequently, knowledge and understanding about maternal stress and coping strategies performed by mothers of premature infants in NICU are still an area in need of research. The purpose of this study aimed to identify the level of maternal stress, related factors, coping strategies, and their perceived effectiveness of mothers of premature infants hospitalized in NICU. This information can lead to more appropriate nursing care for infants and their mothers when they are hospitalized in NICU.

Conceptual Framework

Transactional model of stress and coping proposed by Lazarus and Folkman, (1984: 32-36) was used as a conceptual framework of this study. According to the

model, psychological stress is defined as a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding personal resources and endangering well-being (Lazarus and Folkman, 1984: 21). Cognitive appraisal is the process of evaluating the personal significance of an event by how important it is to one's well-being (primary appraisal) and what can be done (secondary appraisal). Primary appraisal is the cognitive processes of valuing the significance of an event. There are three types of primary appraisal: irrelevance, benign/positive, or stressful. When an encounter with the environment carries no implication for a person well-being, it falls within the category of irrelevant. An appraisal of benefit means that a person's wants are being met, limiting the possibility of stress. Harm/loss is a perception that some damages have already occurred, with harm to social or self-esteem. Threat is a harm/loss that is anticipated, but has not yet taken place. Challenge is similar to threat, except there is a possibility for growth or gain. Secondary appraisal is a complex evaluative process that takes into account which coping options are available, the likelihood that a given coping option will accomplish what it is supposed to, and the likelihood that one can apply a particular strategy or set of strategies effectively. Coping refers to one's cognitive and behavioral efforts to manage stress. Specific coping strategies serve to manage and alter stress (problem-focused coping) or regulate one's emotional response to stress (emotion-focused coping). There may be no universally good or bad coping processes, though some might more often be better or worse than others (Lazarus, 1993: 235). A coping strategy that produces positive outcomes in one context, or in one person, may not in another.

A transactional model views stress and coping as productions of cognition, that is, as products of the way an individual appraises his or her relationship with the environment. Furthermore, that it is these interactions between an individual and the environment that results in stress experiences and not simply whether or not a serious or significant event occurs. This model has been widely used because of its emphasis on the individual and his or her ability to cope with demands, and on the process, on what is happening between the individual and the environment in any given stressful encounter and how changes, which occur over time or across encounters, are interpreted and reacted to. Thus, the process contains two elements which can be applied to the present focus of study. The first element focuses on the actual

interchange between the individual and the environment e.g. with the birth of a premature infant, the focus is on the specific stressful encounter faced by mothers brought about by the premature rather than a term birth. The second element focuses on the flow and transformation of the interchange over time. It emphasizes flux and change over time in diverse encounters (Lazarus, 1981 cited by Lau: 2001: 78-79). That is, a stressful encounter is not a momentary static stimulus in the environment to which the individual gives a single response. Rather, it is a continuous flow of events over time e.g. the coping process of responding to the concerns and distress common to mothers following giving birth to a premature infant. The process tends to occur over an extended time and encompasses many encounters that trigger a range of psychological and emotional changes. Initially, mothers may experience a range of negative feelings (shock, loss, guilt and sadness). Eventually, they may accept the loss of an expected full term infant and hopefully come to accept the premature birth (Lau: 2001: 78-79).

This study focused on maternal stress experiences, their coping strategies, and maternal perception of coping effectiveness during their infants' hospitalization. Maternal stress appraisal depended on how mother viewed the situation in terms of its relevance for her well-being. The way mother coped with a stressful event in NICU had been shown to be an important variable in her adjustment to that event and the resources available to manage the event. The fulfillment in coping generated positive outcomes and result in adaptation. Maternal coping response to stressful experiences while the infant is in an NICU takes place in an environment in which nurses are present and highly visible. Thus, it is a nurse's role to assess every mother of infants hospitalized in NICU, in particular, what the maternal perceived stressors in NICU are, and how mothers in NICU cope with stress. Identifying experiences perceived as most stressful by parents can help the nurse in anticipating maternal needs. Furthermore, knowing which nursing staff behaviors are perceived as most helpful and how mothers might be facilitated in their coping with the NICU experience can help the nurse in formulating policies and interventions (Young-Seideman, et al, 1997: 169-170).

In this study, sights and sounds, infant appearance and behavior, and maternal role alterations were viewed as stressors. When mothers encountered stressors, they might appraise the events as threat, harms or losses, or challenge. These were

influenced by internal factors which were maternal age, maternal education, family income, and perceived infant's illness severity. Maternal coping strategies in response to stress would be associated with maternal appraisals. Perceived effectiveness of coping strategies was individual judgment. Figure 1 illustrates the theoretical integration of these factors, which forms the conceptual framework for this study.

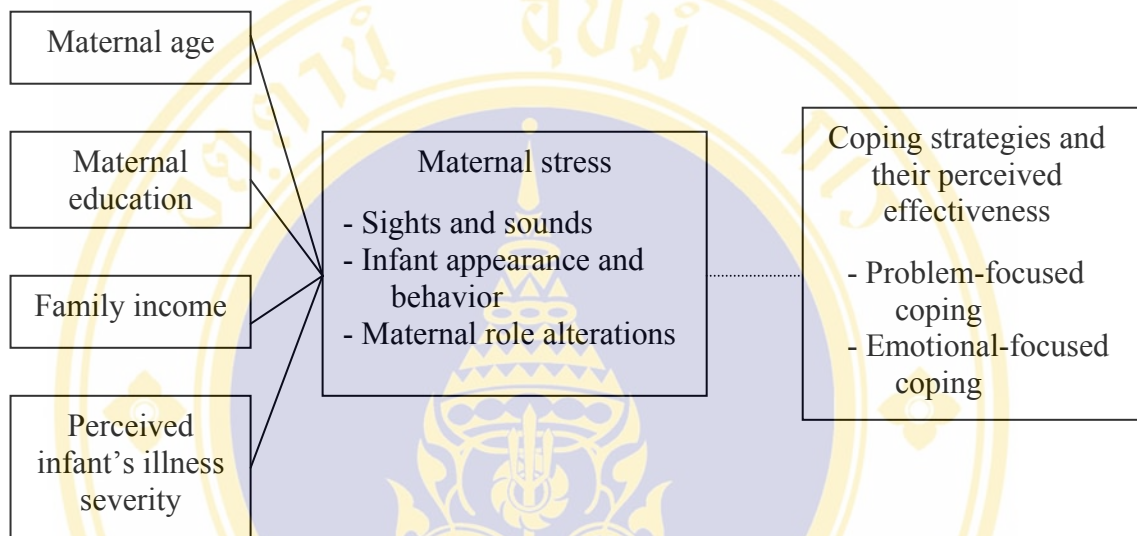


Figure 1. Conceptual framework for this study

Research Questions

1. What is the level of stress of mothers of premature infants hospitalized in NICU?
2. Is maternal stress related to maternal age, maternal education, family income, and perceived infant's illness severity?
3. What is coping strategies and their perceived effectiveness of mothers of premature infants hospitalized in NICU?

Objectives of the Study

- 1 To describe the level of stress of mothers of premature infants hospitalized in NICU.

2. To examine the relationships between maternal stress and maternal age, maternal education, family income, and perceived infant's illness severity.
3. To explore coping strategies and their perceived effectiveness of mothers of premature infants hospitalized in NICU.

Research Hypothesis

Maternal stress is correlated with maternal age, maternal education, family income, and perceived infant's illness severity.

Scope of the Study

This descriptive study aimed to describe maternal stress, relationships between maternal stress and maternal age, maternal education, family income, and perceived infant's illness severity, coping strategies and their perceived effectiveness of mothers of premature infants hospitalized in NICU. The samples were recruited from 60 mothers of premature infants hospitalized in NICU of Songklanagarind and Hatyai Hospital in Songkhla province. Data were collected in a six-month period from February to July 2005.

Significant of the Study

Providing useful information about the phenomenon of stress of mothers of premature infants hospitalized in NICU for neonatal nurses to develop intervention to enhance maternal coping strategies.

Definition of Terms

Maternal stress is maternal perception of stressors experienced during NICU hospitalization of their infants. They are measured by the Parental Stressor Scale: NICU (PSS: NICU). The three subscales of PSS NICU consist of sights and sounds, infant appearance and behavior, and maternal role alterations.

Sights and sounds refers to general features in the environment of NICU that during maternal visit. This subscale is in items 1-6 of the PSS: NICU. The higher scores indicate higher maternal stress of sights and sounds.

Infant appearance and behavior refers to general features of the infants and what infants behave during maternal visit. This subscale is in items 7-19 of the PSS: NICU. The higher scores indicate higher maternal stress of infant appearance and behavior.

Maternal role alterations refers to maternal feeling and/or situation that mother could not make her own relationship with the infant. This subscale is in items 20-28 of the PSS: NICU. The higher scores indicate higher maternal stress of maternal role alterations.

Related factors refers to maternal age, maternal education, family income, and perceived infant's illness severity as follows:

Maternal age refers to period of time after birth counted by years. Ages more than six months will be counted as one year, while the less will be deleted.

Maternal education refers to number of years that a mother spent in educational system on the criteria of the Ministry of Education and the Ministry of University Affairs.

Family income refers to a total amount of money the family earns per month. It is reported by baht per month.

Perceived infant's illness severity refers to maternal perception of premature infant's medical condition including clinical manifestation, infant behaviors and appearance. It is measured by rating scale. Higher scores mean more perceived severity.

Maternal coping strategies refers to maternal cognitive and behavioral efforts used to manage specific stress that are appraised to be exceeding the resources of the mother. It is measured by the Thai Coping Scale: occurrence of coping strategies, which contains two subscales: problem-focused coping and emotional-focused coping. Each item indicates maternal coping responses.

Perceived effectiveness of maternal coping strategy refers to maternal perception for the efficiency of her coping strategies in response to maternal stress when her premature infant hospitalized in NICU. It is measured by the Thai Coping Scale: for the effectiveness of each performed coping strategy. Higher scores indicate higher effectiveness of maternal coping strategy as perceived by mother.

CHAPTER II

LITERATURE REVIEW

Literature related to stress, related factors, coping strategies, and perceived effective coping strategies of mothers of premature infants hospitalized in NICU were reviewed, as follows:

1. Premature infants in NICU
2. Stress and coping
3. Maternal stress and related factors
4. Maternal coping strategies

Premature Infants in NICU

Before 1960 prematurity was defined as the birth of an infant weighing 2,500 grams or less because birth weight was the most frequently and reliably recorded measure of infants, and was used to identify newborn infants for potential risk of mortality and morbidity. However, it was observed that not all infants weighing 2,500 grams or less required the same level of care and the American Academy of Pediatrics in 1967 recommended that all newborns be classified by birth weight, gestational age and intrauterine growth indicators. Bataglia & Lubchenco (1967 cited by Lau, 2001: 6) established criteria that set the separation between premature and term infants. From their work, six categories emerged: three according to intrauterine growth pattern (small-for-gestational-age, appropriate-for-gestational-age, and large-for-gestational age) and three by gestational age (premature, term, and postmature). The term “very low birth weight” (VLBW) infants refers to premature infants born at less than 1500 grams, while the term “extremely low birth weight” (ELBW) has been adopted to describe premature infants whose birth weight is less than 1000 grams (Yu & Hollingsworth, 1980 cited by Lau, 2001: 6).

Causes of premature labour

Premature delivery is about equally distributed between those instances that follow spontaneous early onset of labor and those in which the early labor is elective

i.e. elective caesarean section (Johnston, 1994 cited by Lau, 2001: 9). The etiology of premature labor is multifaceted but can be broadly classified under four headings: (1) complications of pregnancy, (2) sociodemographic factors, (3) iatrogenic factors, and (4) unknown causes (Freda, et al., 1991: 141; Lipshitz, et al., 1993 cited by Lau, 2001: 9). It is common that women who have cervical incompetence tend to have a premature delivery (Kelnar & Harvey, 1987 cited by Lau, 2001: 9), especially between 20-24 weeks. Placenta previa and abruptio placenta both frequently result in premature deliveries (Harlow & Spencer, 1999 cited by Lau, 2001: 9). Other factors occurring in 20% to 50% of premature labor is multiple pregnancy most likely due to over distension of the uterus (Revenis & Johnson-Robbins, 1999 cited by Lau, 2001: 9). Maternal illness, including hypertension, diabetes, cardiac and renal disease, may result in premature delivery as a result of either spontaneous labor or obstetric intervention such as induction of labor due to the risk the illness poses on the mother (Brackley & Rubin, 1999 cited by Lau, 2001: 9-10).

Socio-demographic risk factors also play a role in premature birth. These include lower socioeconomic status, poor maternal nutrition, poor antenatal attendance and care, and pregnancy at a young age (< 18 years) (Wildschut, 1999 cited by Lau, 2001: 10). It has been reported that the younger the mother, the lighter the infant and the higher is the rate of premature delivery (Macfarlane, et al., 1999 cited by Lau, 2001: 10). Maternal smoking is an important risk factor for premature birth and may contribute to 17% of all known causes (Wright, et al., 1998 cited by Lau, 2001: 10). Cigarette smoking during pregnancy reduces the eventual fetal birth weight and is related directly to the number of cigarettes smoked (Lieberman, et al., 1994: 1127-1131). Birth weight at term is reduced an average of 170 gm. if more than 10 cigarettes are smoked per day; and if more than 15 cigarettes are smoked per day this may reduce the infant's weight by 300 gm. (Kliegman, 1997 cited by Lau, 2001: 10). Of all other epidemiological factors, a history of previous premature delivery correlates most strongly with subsequent spontaneous premature birth. Women with one previous spontaneous premature delivery have a 37% risk of having a second, and those with two or more premature deliveries have a 70% risk of further delivering a premature infant (Keirse, et al., 1978: 82-85).

Characteristics of the premature infant

Prematurity accounts for the large number of admissions to an NICU. The immaturity places infants at risk for not only neonatal complications (e.g., hyperbilirubinemia and respiratory distress syndrome, which is the highest in the premature infant) but also for other high risk factors (e.g., congenital anomalies in association with prematurity). The outlook for premature infants is largely, but not entirely related to the state of physiologic and anatomic immaturity of the various organs and systems at the time of birth. Infants at term have advanced to a state of maturity sufficient to allow a successful transition to the extrauterine environment. Infants born prematurely must make the same adjustments but with functioning immaturity proportional to the stage of development reached at the time of birth. On inspection, premature infants are very small and appear scrawny because they lack or have only minimal subcutaneous fat deposits and have a proportionately large head in relation to the body, which reflects the cephalocaudal direction of growth. The skin is bright pink (often translucent, depending on the degree of immaturity), smooth, and shiny (may be edematous), with small blood vessels clearly visible underneath the thin epidermis. The fine lanugo hair is abundant over the body (depending on gestational age) but is sparse, fine and fuzzy on the head. The ear cartilage is soft and pliable, and the soles and palms have minimal creases, resulting in a smooth appearance. The bones of the skull and the ribs feel soft, and the eyes may be closed. Male infants have few scrotal rugae, and the testes are undescended; the labia and clitoris are prominent in female (Wong, 2003: 374-376).

Premature infants are inactive and listless. The extremities maintain an attitude of extension and remain in any position in which they are placed. Reflex activity is only partially developed-sucking is absent, weak, or ineffectual; swallowing, gag, and cough are absent or weak; and other neurologic signs are absent or diminished. Physiologically immature, many premature infants are unable to maintain body temperature, have limited ability to excrete solutes in the urine, and have increased susceptibility to infection. A pliable thorax, immature lung tissue, and an immature regulatory center lead to periodic breathing, hypoventilation, and frequent periods of apnea. They are more susceptible to biochemical alterations such as hyperbilirubinemia and hypoglycemia, and they have a higher extracellular water

content that renders them more vulnerable to fluid and electrolyte derangements. Premature infants exchange fully half of their extracellular fluid volume every 24 hours compared with one seventh of the volume in adults. The soft cranium is subject to characteristic unintentional deformation, or “preemie head”, caused by positioning from one side to the other on the mattress. The head looks disproportionately longer from front to back, is flattened on both sides, and lacks the usual convexity seen at the temporal and parietal areas (Wong, 2003: 374-376). Because of their immaturity and instability, premature infants are prone to many health problems.

Common health problems of the premature infant

The major problems faced by premature infants relate to the degree of maturity of their organ systems with a direct correlation between the degree of immaturity and severity of the problems. Infants who are delivered prematurely are at risk of various problems, which complicate their immediate neonatal and subsequent development even though most of these problems are potentially preventable or treatable. Some of the common problems faced by all premature infants are:

Hypothermia

Maintaining the premature infant in the appropriate temperature becomes one of the most important factors in the effort to decrease neonatal morbidity and mortality. Premature infants are prone to hypothermia for a number of reasons: (1) a greater surface-area-to-weight-ratio, (2) low brown fat stores, (3) less subcutaneous tissue, and (4) a flaccid posture which increases the surface exposed to the environment (Lemons & Bradburn, 1988 cited by Lau, 2001: 11). To overcome these effects, the premature infant should be nursed in a neutral thermal environment, defined as the environmental temperature at which the infant maintains a normal body temperature at the lowest level of energy expenditure and therefore minimal oxygen consumption (Hey, 1994 cited by Lau, 2001: 11). So, if the temperature of the premature infant can be maintained within that range the caloric expenditure will be decreased (Lemons and Bradburn, 1988 cited by Lau, 2001: 11).

Respiratory problems

Respiratory distress syndrome

The improvement in neonatal survival and morbidity in the last 15 years is due to the effective management of respiratory problems (Black & Whitfield, 1991

cited by Lau, 2001: 12). Respiratory distress syndrome or hyaline membrane disease is the most common cause of distress in premature infants (Bucuvalas & Balistreri, 1995 cited by Lau, 2001: 12), and affects between 10% to 20% (Wyly, 1995 cited by Lau, 2001: 12) of all newborns at risk. Respiratory distress syndrome may affect up to 70% of infants born between 28-30 weeks gestation (Pettett, 1986 cited by Lau, 2001: 12), and occurs because the lung is deficient in pulmonary surfactant, a surface tension reducing agent that prevents alveolar collapse at the end of the expiratory phase, resulting in a loss of lung volume (Hansen & Corbet, 1998 cited by Lau, 2001: 12). Thus, surfactant has two main functions in the lungs: (1) reduction of surface tension so that less pressure is required to keep the alveoli open; and (2) maintaining alveolar stability by varying the surface tension with alveolar size. Surfactant deficiency results in a decreased lung compliance, alveolar hypotension and imbalance between pulmonary ventilation and perfusion and subsequent hypoxaemia and hypercarbia. Surfactant replacement therapy may be initiated at birth in premature infants at risk of respiratory distress syndrome. Therapeutic interventions include: maintaining adequate ventilation and oxygenation; correcting acid-base imbalances; maintaining neutral thermal environment; maintaining fluid and electrolytes; optimising caloric intake and growth; and promoting parent-infant attachment (Whitsett, et al., 1994; Hubbell & Webster, 1986 cited by Lau, 2001: 12-13).

Apnea of prematurity

Premature infants are prone to recurrent bouts of apnea. Apnea is defined as the cessation of breathing for greater than 20 seconds or the cessation of breathing accompanied by a decrease in heart rate and/or the presence of cyanosis (Gross, 1990 cited by Lau, 2001: 13). The premature infant's central nervous system and the respiratory control center in the medulla which establishes the basic rhythm of respiration is immature. Some researchers believe that rapid eye movement (REM) sleep increases the incidence of apnea (Bradburn and Schreiner, 1988 cited by Lau, 2001: 13). During REM sleep, inhibition of the intercostal muscles occurs leaving respiration more dependent on the muscles of the diaphragm. In premature infants, the diaphragmatic muscles tire easily. Time is the main factor in determining the sequence of pathophysiological events associated with apnea. The longer the apneic episode lasts, the more serious are the metabolic, cardiocirculatory and cerebral effects

(Kapplus, 1985 cited by Lau, 2001: 13). The apnea may be treated with gentle tactile stimulation, for example, gentle rubbing of the infant's back or the soles of the feet (Milner, 1999 cited by Lau, 2001: 13). A group of medications known as methylxanthines such as theophylline and caffeine are used to treat apnea of prematurity and have been shown to reduce apneic episodes by 60-90% in premature infants (Murat, et al., 1981: 984-989). These medications increase the sensitivity of the respiratory center to carbon dioxide and also exert a central stimulatory effect on brain stem respiratory neurons, often markedly decreasing the frequency and severity of apneic episodes. Methylxanthines also increase alveolar ventilation causing a reduction in arterial carbon dioxide (Gross, 1990 cited by Lau, 2001: 14).

Hypoglycemia

Premature infants are prone to hypoglycemia because of a smaller reserve of liver glycogen stores and the increased metabolic demands imposed by extra uterine life. Hypoglycemia is common in infants of low birth weight, particularly in those with intrauterine growth retardation. These infants have considerably reduced fat deposits for the provision of free fatty acids as a fuel substitute for glycogen (Polk, 1998 cited by Lau, 2001: 14). Hypoglycaemia is further accentuated by cold stress, respiratory distress, perinatal asphyxia and sepsis (Polk, 1998; Yu, 1987 cited by Lau, 2001: 14). Careful monitoring of blood glucose levels and observing for clinical symptoms (jitteriness, lethargy, poor feeding, apnea, cyanosis and seizures) are part of the routine care of the premature infant. If the infant is well early feeding will be introduced; or the infant will be fed intravenously with 10% glucose.

Hyperbilirubinemia

To understand hyperbilirubinaemia in the premature infant, normal metabolism in the newborn must be reviewed. Approximately 80% of the body's bilirubin is formed from the breakdown of erythrocytes (Korones, 1986 cited by Lau, 2001: 14-15). Haemoglobin is then split into the two fragments, heme and globin. The unconjugated bilirubin is formed from heme in the reticulo-endothelial cells that are primarily located in the spleen and liver. The normal newborn's production of bilirubin is 102 to 136 mmol/kg body weight per 24 hours. This is about 2.5 times the rate of bilirubin production in adults (Maisels, 1994 cited by Lau, 2001: 15). The increased production of bilirubin in sick premature infants is partially explained by an

average red cell life span as low as 30 days, compared to 60-70 days in the healthy term infant (Ives, 1999 cited by Lau, 2001: 15). Secondly, there is a diminished capacity of the liver to excrete the excessive bilirubin delivered to it. Hyperbilirubinaemia is therefore a common occurrence in all neonates but jaundice occurs in only half of them because serum bilirubin levels must exceed 68 to 102 mmol before it is visible as pigment in the skin. In premature infants, jaundice is first evident after 48 hours and disappears by the 9th or 10th day. To treat this, phototherapy is used which provides an artificial source of light that changes bilirubin into nontoxic, water soluble isomers which can be excreted in the urine and feces (Korones, 1986 cited by Lau, 2001: 15).

Fluid and electrolytes needs

Careful management of fluid and electrolytes balance is a critical feature in the care of premature infants and will enhance their survival and developmental outcomes (Bell & Oh, 1994 cited by Lau, 2001: 15-16). Balance of electrolytes is necessary to maintain cell membrane potentials, movement of substances into and out of cellular compartments, and continued tissue growth (Seri & Evans, 1998 cited by Lau, 2001: 16). If the premature infant is unable to be fed orally, parenteral nutrition is introduced (intravenous delivery of a hypertonic solution containing dextrose, amino acids, protein, carbohydrates, fats, electrolytes, minerals, vitamins and trace elements) to provide adequate nutrition and achieve normal growth rates (Yu, 1987; Kalhan & Price, 2001 cited by Lau, 2001: 16).

Because of their health problems, premature infants need intensive care immediately and longer hospital stay. Significant medical, technological advances and the regionalization of neonatal care have markedly increased the survival rates of premature infants. However, birth and prolong hospitalization of premature infants is very stressful for their mothers, who are concerned about infant survival and health crises, the infant's fragile appearance, separation from the infant, and the loss of the anticipated maternal role (Miles & Holditch-Davis, 1999: 130; Young-Seideman et al., 1997: 173). Two studies (Crnic, et al., 1983; Harmon & Culp, 1981 cited by Prudhoe & Peters, 1995: 140) reported that parents of preterm were aware that they were more active, more protective and overly watchful than parents of full term babies (Wong, 2003: 376).

Stress and Coping

Stress

Stress is one of the important mental health problems. There are a number of the researchers interested in this area because it is associated with major causes of death including heart disease, cancer, and acquired immune deficiency syndrome (McCain, & Smith, 1994: 221). The term of stress was variously described. However, the term used by Lazarus defined as a collective term for an area of the study. It is neither stimulus, nor response, nor intervening variable (Lazarus & Folkman, 1984).

Stress was defined into three classic definitions; stress as a stimulus, stress as a response, and stress as a transaction. Stress as a stimulus is focused on any event or environment stimulus that causes a person to feel tense or arouse. This kind of stress is viewed as an external stimulus or stressor, for example, natural disasters, noxious conditions, illness, or being laid off from work, marital disharmony, and work-family conflicts stressor effects (Kohen, et al. 1995 cited by Thammathai, K., 2001: 11). There are many researches that conducted to identify characteristic of the environment that lead to illness. Holmes and Rahe (1967 cited by Thammathai, K., 2001: 11) found that when life changed, whatever positive or negative, it was stressful and could lead to a negative impact. Lazarus & Folkman (1984) assumed that certain situations were normatively stressful but these situations did allow for individual differences in the evaluation of events.

Second definition, stress as a response, which might refer to a subjective response. In this sense, stress is the internal mental state of tension or arousal. It is the interpretive, emotive, defensive, and coping processes occurring inside individual. Such processes might promote growth and maturity. These processes also might produce mental strain. In addition, stress response can be viewed based on physiological theory. In this sense, stress referred to body's reaction to demand or damaging intrusions. This was the notion in which Selye purposed (Selye 1980 cited by Thammathai, K., 2001: 11). He defined stress as a nonspecific response of the body to any nonspecific demand or stressor. He also defined the sequence of the body responses to a stressor as the General Adaptation Syndrome (GAS). Demand promoted a natural arousal of the body to a higher level of activity.

The third definition, stress as a transaction. It is apparent that this definition makes better understanding to the individual stress. It is contrast to the static and unidirectional stimulus and response model of stress (Lazarus & Folkman, 1966, cited by McCain, & Smith, 1994: 221-227). The transactional model defined stress as a relationship between demands and the power to deal with them without unreasonable or destructive costs (Rice, 1999 cited by Thammathai, K., 2001: 12). Transaction was based on the work of Lazarus & Folkman. They indicated the meaning of stress within sphere of psychological stress as “a particular relationship between person and the environment that is appraised by the person as relevant to his or her well-being and in which the person resources are taxed or exceeded. Threat and challenge, or harm-loss characterized stressful appraisal at primary appraisal process. After that, the person would evaluate coping resources and options for dealing with situation as secondary appraisal. Therefore, stress as transaction referred to the process that occurred when individual adjusted to or dealt with environmental circumstances of disruption or threatens to disruption of their physical and psychological function (Lazarus & Folkman, 1984: 153).

Nowadays, the meaning of stress is recognized both physiological and psychological components. Physiological component refers to the body’s physical reaction to demand or damaging instructions. For examples, under stress our palms are sweated, heart rate are increased, neck and shoulder muscle become tense, having headache and stomach churn. Psychological component, on the other hand, is the characteristics of difficult to concentrate, having emotional reactions including volatile, angry easily, and tendency dwell on unpleasant thought (Wortman, et al., 1999 cited by Thammathai, K., 2001: 13). Regarding to three definitions previously described, the third definition of stress, transactional model, is the most comprehensive one. It emphasizes on explaining and understanding human stress. Stress as transaction has been defined as states of the body’s physical and emotional responses to external and internal stimuli. It occur (Lazarus & Folkman, 1986 cited by: Thammathai, K., 2001: 13).

Based on the meaning that the stress is individual adjustment to the environmental circumstances, psychological factors such as personality traits, perception, and emotions can be associated with stress (Wade & Tavis, 1998 cited by:

Thammathai, K., 2001: 13). Therefore, the effects and responses to the stressor depend on the individual's perception of the intensity of stressor and acute/chronic duration of stressor, cumulative effect of simultaneous stressors, sequence of stressors, individual previous experience with stressors, and amount of social support.

Coping

Lazarus's definition of coping refers to the process of managing demands both external and internal that is appraised as taxing or exceeding the resources of an individual (Lazarus, 1993: 237). This definition has three important characteristics. Firstly, it is process-oriented. Coping refers to what an individual actually thinks or does and the changes in these thoughts and actions as the situation unfolds. Secondly, the definition is contextual which emphasizes that the transaction and process for any two events are not the same. Individuals use different coping strategies at varying phases of efforts to solve a given problem. Thus, coping is not determined solely by personal disposition but also by the individual's appraisal of the demands of a particular situation. Thirdly, coping is defined without reference to its outcome (Lazarus, 1993: 234-236).

Coping refers to the efforts to manage moment by moment, not necessarily to the success of these efforts. People are often confronted with situations that cannot be mastered or controlled. In such cases, effective coping involves coming to terms with undesirable outcomes rather than mastering them. Coping consists of efforts to manage, reduce, tolerate or minimize the demands created by the stressful transactions. So clearly, the relationship between coping and a stressful event represents a dynamic process and coping can be seen as a set of reciprocal transactions by which the event and the individual influence each other.

Lazarus and Folkman identified two forms of coping: (1) problem-focused coping which is the management of the problem that is causing the distress and (2) emotion-focused coping, the management of the emotions or distress that arise from the stressful transactions. Problem-focused coping is directed at defining the problem, generating alternative solutions and weighing up the options for action in terms of their costs and benefits. Problem-focused coping embraces an array of problem-oriented actions, which include strategies that are directed at the environment and

those that are directed at the self which include cognitive problem identification and solving and decision making. Emotion-focused coping is used to minimize anxiety, maintain hope and optimism, to reduce the reality of the fact and to acknowledge that the event is harmful. Problem-focused and emotion-focused forms of coping can be mutually facilitative. Coping has been named a “shifting” process in which a person must, at certain times, rely on one form of coping, say emotion-solving strategy and at other times, on a problem-solving strategy, as the demands of the situation change (Lazarus and Folkman, 1984: 141-167).

Although different coping strategies are used in different situations, Folkman and colleagues (1979) drew attention to the importance of considering the extent to which the situation is judged to be amenable to control. Problem-focused strategies are proposed to be adaptive in situations perceived as controllable and maladaptive in situations perceived to be uncontrollable. In contrast, emotion-focused strategies are proposed to have positive effects on adaptation in uncontrollable situations and negative effects in situations perceived as controllable.

The appraisal of stress and coping

When the person encountered stressors, they appraised whether the significance of event threatens their well being. The theory identified two processes: cognitive appraisal and coping, as critical mediators of stressful person-environment relationships and their immediate and long-term outcomes. Cognitive appraisal was a process through which the person evaluated whether a particular encountered environment was relevant to his or her well-being and if so, in what way. Cognitive appraisal has been identified into three types including primary, secondary and reappraisal (Lazarus and Folkman, 1984: 25-38).

Primary appraisal: the person evaluated whether he or she has anything at stake in this encounter. Through primary appraisal a person judged whether the encounter was irrelevant, benign-positive, or stressful.

An irrelevant encounter has no significant for one’s well-being, and the person has no stake in its outcome.

Benign-positive appraisals occur if the outcome of an encounter is construed as positive, that is, if it preserves or enhances well-being or promises to do

so. These appraisals are characterized by pleasurable emotions such as joy, love, happiness, exhilaration, or peacefulness. However, totally benign-positive appraisals that are without some degree of apprehension may be rare. For some people there is always the prospect that the desirable state will sour, and for those who believe that one must ultimately pay for feeling good with some later harm, benign appraisals can generate guilt or anxiety. These illustrations anticipate the idea that appraisals can be complex and mixed, depending on person factors and the situational context.

Stress appraisals include harm/loss, threat, and challenge.

Harm/loss: when some damage to the person has already been sustained, as in an incapacitating injury or illness, recognition of some damage to self or social esteem, or loss of a loved or valued person. The most damaging life events are those in which central and extensive commitments are lost.

Threat concerns harms or losses that have not yet taken place but are anticipated. Even when a harm/loss has occurred, it is always fused with threat because every loss is also pregnant with negative implications for the future. The primary adaptational significance of threat, as distinguished from harm/loss, is that it permits anticipatory coping. To the extent that humans can anticipate the future, they can plan for it and work through some of the difficulties in advance, as in anticipatory grief work.

Challenge, the third kind of stress appraisal, has much in common with threat in that it too calls for the mobilization of coping efforts. The main difference is that challenge appraisals focus on the potential for gain or growth inherent in an encounter and they are characterized by pleasurable emotions such as eagerness, excitement, and exhilaration, whereas threat centers on the potential harms and is characterized by negative emotions such as fear, anxiety, and anger.

Threat and challenge are not necessarily mutually exclusive. A job promotion, for example, is likely to be appraised as holding the potential for gains in knowledge and skills, responsibility, recognition, and financial reward. At the same time, it entails the risk of the person being swamped by new demands and not performing as well as expected. Therefore, the promotion is likely to be appraised as both a challenge and a threat. Although threat and challenge appraisals are distinguished from one another by their cognitive component (the judgment of

potential harm or loss versus mastery or gain) and their affective component (negative versus positive emotions), they can occur simultaneously. As stated above, threat and challenge can occur simultaneously, and must be considered as separate, although often related, constructs. Moreover, the relationship between threat and challenge appraisals can shift as an encounter unfolds. A situation that is appraised as more threatening than challenging can come to be appraised as more challenging than threatening because of cognitive coping efforts which enable the person to view the episode in a more positive light, or through changes in the environment relationship for the better.

Challenge, as opposed to threat, has important implications for adaptation. For example, people who are disposed or encouraged by their circumstances to feel challenged probably have advantages over easily threatened people in morals, quality of functioning, and somatic health. Challenged persons are more likely to have better morale, because to be challenged means feeling positive about demanding encounters, as reflected in the pleasurable emotions accompanying challenge. The quality of functioning is apt to be better in challenge because the person feels more confident, less emotionally overwhelmed, and more capable of drawing on available resources than the person who is inhibited or blocked. Finally, it is possible that the physiological stress response to challenge is different from that in threat, so that diseases of adaptation are less likely to occur.

Secondary Appraisal:

When people are in jeopardy, whether it be a threat or a challenge, something must be done to manage the situation. In that case, a further form of appraisal becomes salient, that of evaluating what might and can be done, which is called secondary appraisal. Secondary appraisal activity is a crucial feature of every stressful encounter because the outcome depends on what, if anything, can be done, as well as on what is at stake.

Secondary appraisal is a complex evaluative process that takes into account which coping options are available, the likelihood that a given coping option will accomplish what it is supposed to, and the likelihood that one can apply a particular strategy or set of strategies effectively. Secondary appraisals of coping options and primary appraisals of what is at stake interact with each other in shaping the degree of

stress and the strength and quality (or content) of the emotional reaction. Various coping options are evaluated, such as changing the situation, accepting it, and seeking more information.

However, for a review of the distinction in coping research by Lazarus and Folkman, people used both forms of coping. Therefore, people used complex combinations of problem-focused and emotion-focused form to cope in stressful encounter. Furthermore, primary and secondary appraisal processes worked interdependently. For example, if coping resources were adequate for dealing with a threat, the degree of threat was diminished. On the other hand, an event that at first might seem non-threatening can become threatening if coping resource turned out to be inadequate for countering environmental demands or overcoming environmental or personal constraints (Lazarus & Folkman, 1985 cited by Thammathai, K., 2001: 17).

Reappraisal refers to a change appraisal on the basis of new information from the environment, which might resist or nourish pressure on the person, and/or information from the person's own reaction. For example, while overt anger affects the other person, it was also noted and reacted to by its initiator. As such, it might result in guilt or shame, or it might generate a feeling of righteousness or even fear. Mediating these complex two-way transactions between the person and environment are cognitive appraisal process. In instances of this type of feedback, threat can be reappraised as unwarranted or, conversely, a benign appraisal might turn into one of threat, creating a succession of changing emotion and appraisal. A reappraisal differs from an appraisal only in that it consequently occurs after an earlier appraisal. Sometimes reappraisals are the result of cognitive coping efforts; these are called defensive reappraisals and are often difficult to distinguish from reappraisals based on new information.

In conclusion, in the reality, appraisal involves two steps, which is primary appraisal and secondary appraisal. Therefore, at first we have to evaluate the situation whether it is a threat or not. Simultaneously, one needs to weigh whether he or she has an adequate resource to deal with that situation. The level of stress one experiences depending on the balance between the two. When one perceives the threat as mild and his or her ability to cope as height, stress will be minimal. However, when one perceives the threat as severe and ones' ability to cope as weak, stress will be

substantially. Coping is not single strategies, but it is a process that applies to all circumstances. Therefore, the techniques one used can change over time and depending on certain circumstances.

Additionally, numerous personal and environmental factors influence appraisal. These include commitments, beliefs, values, feeling, emotions, and views of what is important. A seemingly appropriate solution might not be useful because it conflicts with individual's values and beliefs. Factors influencing cognitive appraisal include two components that is personal and situational factors.

1. Personal factors (Lazarus & Folkman, 1984: 55-80), commitments and beliefs are among the most important personal factors affecting cognitive appraisal. Commitment is an expression of what was important to people, and it underlies the choices people made. It affects appraisal by guiding people into or away from situations that whether threaten, harm, or benefit to them and by shaping cue-sensitivity. It also influences appraisal through ones impact on vulnerability. The deeper a person's commitment, the greatest the potential for threat and challenge, yet at the same time, the dept of commitment can also push a person toward ameliorative action and helps sustaining hope. Beliefs also determine how a person evaluated what is happening. It might be difficult to observe its influence on appraisal. However, the impact of beliefs can be observed when there was a sudden lost of belief or conversion to a difference belief system.

Beliefs about personal control can be both general and situational. Generally, beliefs about control, which concerned the extent to which the person believed that outcomes could be control, are most likely to affect appraisal in ambiguous situations. The less ambiguity there is about a particular encounter, the more likely situational appraisals of control will affect emotion and coping. Situation appraisals of control are not restricted to the expectations of environment. They can also refer to expectations for control one's own response to the transaction. An appraisal of controllability can also heighten threat when controlling was contrary to a preferred style or conflicts with other commitments or goals. The assumption that situational appraisal of control is based incomplete information; they are less likely to be accurate. However, situational appraisal of control, over the environment and/or one's self, influence emotion and coping. Existential beliefs, such as faith in God, fate, or some natural order in the universe, are general beliefs that enable people to create meaning and maintain hope in difficult circumstances. They might be

affectively neutral, but they can arouse emotion when they converge with a strong commitment in a particular encounter.

2 Situational factors (Lazarus & Folkman, 1984: 82-104). These include novelty and uncertainty event. Novelty encourages appraisal inference based on related previous experience or on general knowledge. Uncertainty event is the analogous construct in human behavior, which introduces the notion of probability. In real-life events, anecdotal observation suggests that maximum uncertainty is often extremely stressful. It can have an immobilizing effect on anticipatory coping processes and cause mental confusion.

Secondly, three temporal situational factors are considered as imminence, duration, and temporal uncertainty. Generally, the more imminent is event, the more urgent and intense the appraisal. Duration refers to the length of time during event occurred. It is closely related to imminence. The difference is that imminence refers to the period before an event occurs, but duration refers to the period of event occurs. In addition, not all enduring stressors lead to exhaustion, for example, habit results from coping, especially cognitive coping. The persistence of a chronic stressor and the damaging effects can provide the opportunity for person to learn to deal with its demands by reappraisal and coping. New skill can be developed, commitments can be reordered, and old goal can be abandoned and replaced with the new one. Temporal uncertainty refers to an event which person not known what will occur. It is associated with greater vigilance at the outset. Whereas, exists evidence suggests that temporal certainty generates coping activity that reduces stress reactions.

Thirdly, ambiguity, the more person factors shape the meaning of the situation, the more intensity the threat. However, ambiguity can reduce threat by allowing alternative interpretations of the significance of an encounter. Forth, the timing of stressful events over the life cycle affect appraisal. The timing of events in relation to other events is also considered if it occurs in juxtaposition to other events, resulting from individual personal difference. In summary, situation and personal factors are always interdependent, and are pivotal for stress and coping.

Maternal Stress and Related Factors

Mothers who have infants in the neonatal intensive care unit go through generally, a period of initial overwhelming shock and disappointment, followed by feelings of failure, and accompanying feelings of panic, anxiety and helplessness (Siegel, et al.,

1993; Vergara, 1993 cited by Lau, 2001: 52). Mothers may experience feelings of guilt for the premature birth, as though they were responsible for the outcome of the pregnancy (Callahan, et al., 1983 cited by Lau, 2001: 52). Apart from blaming themselves for the premature birth, the mothers may feel guilty over their inability to provide immediate care for their infant (Whettsell & Larrabee, 1988 cited by Lau, 2001: 52). The adaptation process may include an anticipatory grieving phase, and preparing for the possibility that their child might die. Whether or not a basis for guilt could be identified, many mothers feel responsible for their infant's condition so that self-blame often characterizes these feelings, either for something they did or else did not do (Berns, et al., 1993 cited by Lau, 2001: 52). Mothers herself experience stress from their own physical exhaustion after the birth of the infant, lack of sleep in the hospital that may be due to unfamiliar environment, the hospital routine, and the presence of other women and their babies. These may contribute to the fatigue state of the mothers. After their physical recovery, at timing of expanding maternal identity by developing maternal-infant attachment at NICU, mothers then experience with added stressors in an unfamiliar environment surrounding their infants

Maternal stress during infant's NICU hospitalization

Holditch-David and Miles (2000: 16-18) interviewed 31 mothers when their infants were six months of age corrected for prematurely and were analyzed using the Preterm Parental Distress Model as the conceptual framework. The analysis verified the presence in the data of the six major sources of stress indicated in: (1) pre-existing and concurrent personal and family factors, (2) prenatal and perinatal experiences, (3) infant illness, treatments, and appearance in the NICU, (4) concerns about the infant's outcomes, (5) loss of the parental role, and (6) health care providers. These mothers clearly found that their pre- and perinatal experience provided a context for their interpretation of the NICU experience and that the major stresses in the NICU were illness severity, treatments, and infant appearance; concerns about the infant's outcomes; and loss of the parental role. Several research teams have identified aspects of the overall NICU environment that may be a major source contributing to the mothers' overall distress and may influence parenting behaviors (Paludetto, et al, 1981; Yu, et al., 1981 cited by Miles, et al., 1993: 148). Many latter studies and literature reviews of the experience of mothers with premature infants hospitalized in

NICUs showed that delivery of a premature infant and admission to NICU represents a stressful time for mothers (Affonso, et al., 1992: 66-69; Beckman & Pokorni, 1988; Boukydis, et al., 1987; Miles, 1989 cited by Prudhoe & Peters, 1995: 140; Brunssen & Miles, 1996: 88; Feldman, et al., 2000: 279; Hughes, et al., 1994: 6-8; McCluskey-Fawett, et al., 1992 cited by Lau, 2001: 49-50, 70; Miles et al., 2002: 86 Lau, 2001:70). Three major aspects of stressors in NICU categorized from those studies included sights and sounds, infant appearance and behavior, and maternal role alteration. Those aspects were reviewed as follow:

Sights and sounds

The first aspect of stressors mother immediately senses when she enters NICU is the unfamiliar features in chaos environment. Those features include the large number of staffs working and moving around, the other infants undergoes emergent procedures, and many kinds of high technology equipments and monitors (LaMontagne, et. al, 1995: 212; Miles, 2002: 82; Tichy, et al., 1988: 40-42; Young-Seideman, et al, 1997: 169; Zeanah & Jone, 1982, cited by Miles, et al., 1993: 148). Miles and colleagues (2002: 82-87) studied perceptions of stress, worry, and support on black and white mothers of hospitalized, medically fragile infants. They found that stress associated with the sights and sounds of the hospital were low to moderate. Concurrently, Yamanantakul, P. (1995: 44-58) studied the relationship between stress level, coping behavior and related factors of mothers of premature babies admitted to NICUs. The results showed that the NICU environment and atmosphere were the stressors for the mothers of premature babies. Much of the technology used to support the newborn in the NICU generates a significant amount of noise and activity. Excessive noise can stimulate the premature or ill term newborn and lead to agitation and crying. This agitation has been shown to cause decreased oxygenation, increased intracranial pressure, and elevated heart and respiratory rates. Noise also disrupts the sleep-wake cycle and may delay recovery and the ability to have positively interactions with parents and caregivers because of fatigue and overwhelming over stimulation (Lefrak & Lund, 2001: 224-225). The noise level was the stressor identified most often. Mothers of prematurely born three-year-old children

remembered the monitor alarms as noxious and as preventive their infant from falling asleep (Wereszczak, et al., 1997: 36)

Infant appearance and behavior

Mother whose maternal identity is interrupted by giving birth to a premature infant during the second trimester will mourn the loss of the "ideal" full term infant. During the postnatal period, mothers continue to expand their maternal identity in relation to the infant's growth and this may be difficult as a premature infant differs from the full term infant in appearance and behavior which associated with the infant's gestational age, and birth weight (Affleck et al., 1989a, Lau, 2001: 51). Miles and colleagues (2002: 82-87) studied perceptions of stress, worry, and support on black and white mothers of hospitalized, medically fragile infants. They found that mothers reported high stress related to the appearance and behavior of their infants. This finding related with Chaisom, P. (1993: 45-81) which studied stress and coping strategies of parents of children hospitalized in pediatric intensive care unit. The results showed that the child's behavior was the most significant stressor for parents. Similarly, Yamanantakul, P. (1995: 44-58) found that infants appearance was the stressor for the mothers of premature babies admitted to NICU. Padden and Glenn (1997 cited by Lau, 2001: 65) interviewed 36 mothers whose infants were admitted to NICU and found that 25 of these mothers commented that the first sight of their infant in the NICU environment was extremely overwhelming, daunting and frightening. Almost of the mothers of prematurely born three-year-old children (90%) began the interview by discussing in detail their first visits to the NICU and by recalling their reactions to seeing their infant. The tiny size and fragile appearance of the infant were particularly distressing, and amount of attached equipment to be shocking. Also seeing their infant on a respirator, attached to numerous monitoring equipments and being fed through tubes or intravenous infusion are major sources of anxiety for mothers (LaMontagne, et. al, 1995: 212; McCluskey-Fawett et al., 1992: 150-; Miles, 2002: 82; Tichy, et al., 1988: 40-42; Young-Seideman, et al, 1997: 169; Zeanah & Jone, 1982, cited by Miles, et al., 1993: 148). They also remembered the pain and procedures their infant endured. Their feeling like their infant was being tortured and being especially angry when their infant was wakened from a peaceful sleep for a

painful procedure. The frequent blood sampling was a source of stress, not only because of the pain, but also because eventually the blood would need to be replaced with a transfusion. The insert of feeding tubes and tube feeding were also reported by parents as very stressful, and some mothers were convinced that tube feeding was more for nurse convenience than for their infant's benefit (Wereszczak, et al., 1997: 35-36). Thus, Nurses and other health care team members need to be sensitive to the impact of seeing a tiny, sick infant surrounded by technology and experiencing painful procedures. Staffs also need to take every opportunity to normalize the baby's appearance, to extent possible, by emphasizing the normal behavioral response and appearance of a preterm infant. Likewise, frequent explanations about the purposes of procedures in the infant's recovery are important (Wereszczak, et al., 1997: 38).

Maternal role alteration

Infant's hospitalization alters the expected parenting role because of interruption of the family's normal activities and their parental responsibilities (LaMontagne, et. al, 1995: 212; Miles, 2002: 82; Tichy, et al., 1988: 40-42; Young-Seidman, et al, 1997: 169; Zeanah & Jone, 1982, cited by Miles, et al., 1993: 148). Miles and colleagues (2002: 82-87) found that mothers reported high stress related to the moderately high stress related to the alteration in their parental role. Concurrently, Yamanantakul, P. (1995: 44-58) studied the relationship between stress level, coping behavior and related factors of mothers of premature babies admitted to NICUs. The results showed that maternal role inadequacy was the stressors for the mothers and maternal role inadequacy was the most significant stressor. Likewise, most of the mothers of prematurely born three-year-old children (94%) recalled the frustration of parenting an infant in the NICU. The separation from their infant was identified by the most mothers as the most difficult aspect of the hospitalization (Affonso, et al., 1992: 66-67; Holditch-Davis & Miles, 2000: 18; Wereszczak, et al, 1997: 36). Nyström and Axelsson (2002: 275) studied mothers' experiences related to separation from their newborns during their first week of life, when the newborns had been transferred to NICU and found that such event involved much emotional strain for the mother, even though the newborn is not seriously ill. The mother found it troubling that they were unable to participate more in the care and nurturing of their infant, for example, holding,

feeding, and bathing the baby. Furthermore, the loss of parental role particularly affected the ability to advocate and make decisions for their infant (Affonso, et al., 1992: 63-66; Holditch-Davis & Miles, 2000: 18; Wereszczak, et al, 1997: 36). Brunssen and Miles (1996: 88-89) studied sources of the environmental stress experienced by 57 mothers of hospitalized medically fragile infants in three dimensions of the hospitalization experiences: alterations in parental role, appearance and behavior of the infant, and characteristics of the hospital environment. The results showed that factors the mothers experienced and found to be most stressful (mean>4) were all in the dimensions of parental role alterations, and infant appearance and behavior. The most stressful aspects were those related infant appearance and behavior, especially seeing infant experience pain and breathing difficulty.

Related factors

The birth of a premature infant is a significant stressful event for the mothers and the family (Boardman, 1995; O'Brien, et al., 1995 cited by Lau, 2001: 50). Even though the factors that affect maternal stress levels are varied, this study focused on personal factors including maternal age and maternal education; family income; and perceived infant's illness severity. These factors might provide a context for interpretation of the NICU experience and might also directly cause stress.

Maternal age

Age is one of the factors influencing stress. Persons with different age do not perceive stress in the same way according to the developmental maturity (Chaisom, P., 1993: 26). Growing up through life span to early adulthood, the individual learns through experiences and achieve developmental maturation. The report showed that older mothers reported greater stress scores, the more highly educated mothers also had higher perceived morbidity scores (Shield-Poe & Pinelli 1997: 34-35). Another research studying the comparison of maternal stress between adolescent and adult mothers showed that adolescents did not fare as well as adults. Younger mothers rated the stressfulness in their lives as higher than did older mothers and reported an inability to deal with the stress (Garcia Coll, et al., 1987; Levine, et al., 1985; Schinke, et al., 1986 cited by Christopher, et al., 2000: 289). Additional finding was that in the NICU, younger mothers experienced higher levels of stress than did older mothers, and general

psychological distress was best predicted by younger maternal age (Meyer, et al., 1995: cited by Christopher, et al., 2000: 289).

Maternal education

Education is one of the factors related with personal behaviors. Education allows human beings have full growth of intelligence and knowledge (Subbamma, 1985: 27), which results in better perception of information about health and illness. It also allowed people to decide to carry out health behavior appropriately (Pender, 1987: 161-162). Whetstone (1986: 967) stated that a person with a high educational level would perceive and understand to learn and seek resource availability to carry out health behavior better than a person with a low educational level. Jalowiec and Powers (1981: 14) stated that the ability to learn from experience is a function of education. In general, the higher education the person acquired the better and more accurate perception the person did. This was because the high-educated person had better chance to obtain more information and had been able to make good decision. Conversely, the low-educated person had a limitation on learning, seeking information (Pender, 1987: 161-162). Being better-educated enables one to recognize associated among factors more readily, which facilitates transference of knowledge and utilization of previously learned and successful behavior. Accordingly, poorly educated persons are less able to use the feedback that they receive to prevent recurrence of difficulties. They may be limited in resolving potential problems before they grow to distressing proportion, thereby leading to reduced coping capacity (Jenkin, 1978 cited by Jalowiec, 1981: 96). Thus, education is a useful resource for a person to understand the disease and treatment. Mothers with a lower education level reported more worry about their infant's health (Miles, et al., 2002: 87). Warorwan, W. (1992: 50-52) studied parental uncertainty of illness of infants' hospitalized in NICU. The result was shown that parental education duration was negative correlated with the uncertainty of infants' illness. Parent with more educated duration experienced lower uncertainty than that with less one.

Family income

Neonatal intensive care unit (NICU) care is costly for the family; therefore financial factors may play a part in increasing maternal stress. Economic hardship may

be added stressor during hospitalization (Dickerson, 1995; McCloyd, 1990; Wilson, 1991 cited by Miles, et al., 2002: 83; Lau, 2001: 51). Yamanantakul, P. (1995: 44-58) studied the relationship between stress level, coping behavior and related factors of mothers of premature babies admitted to NICUs. The study found that finance was the stressor for the mothers of premature babies. A family with higher income than expense will exhibit lower stress than that with lower one. Mittrthongtae, J. (1989: 70) found that spouse of chronic ill patients with higher family income experience stress lower than that with lower one. Similarly, Kongpan, S. (1990: 32) found that income was significantly and positively correlated with passive appraisal and the reframing family problem. With medical payment provided by social, health, or government insurance, mother might experience lower stress (Johnson, 1980 cited by Chaisom, P., 1993: 30). According to the studies conducted in Thailand, almost of caregivers reported financial burden from caring of their mental ill relatives. They must leave work in order to provide care to their child with mental illness. For instance, they reported burden of the expenditure on the area of traveling expense, cost of treatment, and household expense (Borijun, P., 1993; Buranangkul, P., 1995; Inim, P., 1988; Nithikul, W., 1992 cited by Thummathai, K., 2001: 33).

Perceived infant's illness severity

Perception is a neurological process by which such recognition and interpretation are effect by sensory stimuli based chiefly on memory (www.answer.com/perception: Sep 05 2005). Facing with the same situation in the same environment, two persons may perceive and react differently (Claus 1980; Grout, 1980 cited by Chaisom, P., 1993: 33). Miles and colleagues (2002: 86) studied perceptions of stress, worry, and support on black and white mothers of hospitalized, medically fragile infants. Maternal perceptions of infant severity were at a moderate level. Similarly, Affleck and associate, (1989a Cited by Lau, 2003: 50-51) reported that factors related to an infant's medical status, including the infant's gestational age, and birth weight can influence parental stress levels. In addition, many studies reported that uncertainty of infant's health status and severity of infant's illness caused a great deal of maternal stress (Affonso, et al., 1992: 68; Brunssen & Miles, 1996: 88; Holditch-Davis & Miles, 2000: 17; Hughes, et al., 1994: 6-7; Shields-Poe & Pinelli, 1997: 36; Wereszczak, et al., 1997: 33-40).

Maternal Coping Strategies

Anecdotal and empirical evidence suggests that giving a premature birth to an infant and NICU hospitalization is a period of significant maternal stress (Hughes, et al, 1994:2). Apart from feelings guilt or failure about the inability to carry the pregnancy to term, mother might blame themselves to be the leading cause of her infant hospitalization. Encountering those stressors, mother needs the way to keep normalcy. Appraising and coping then processed in her cognition, both problem-focused and emotional-focused coping. In addition, coping strategies used and the abilities to deal with previous stressful situations may predict how mothers may cope with the current stressful situation (Lau, 2001: 52). As proposed by Lazarus that there was no universally good or bad coping, finally, their outcomes are maternal adaptation. Several investigators have examined efforts that may represent particular types of coping mechanism. Young-Seideman and colleagues (1997: 175), studied parental stress and coping in NICU, reported that problem-focused coping subscale mean score for parents of children in NICU was higher than other NICU subscale scores. This was congruent with Affleck and associates (1991: 23-24), that questioned parents at the NICU discharge about the type of coping strategies they had used during the infants' hospitalization. Results showed that mothers typically used a combination of coping. Likewise, a controlled prospective longitudinal study of stress experiences of parents (60 mothers and 59 fathers) with premature infants born from 30-35 weeks gestation being cared for in a tertiary special care nursery, the result revealed that parents used both emotion-focused and problem-focused coping strategies to deal with the stressful events (Lau, 2001: 92-94). Yamanantakul, P. (1995: 44-58) studied stress and coping in 60 mothers of premature infants admitting in NICU, and found that there was a significantly high positive correlation between stress levels and problem-focused coping. Mother used problem-focused coping more than emotional-focused coping. These findings are similar to previous studies with mothers of infants hospitalized in a NICU (Hughes, et al., 1994: 6-7; Meyer, et al., 1995: 412-417; Miles et al., 1992: 261-269).

Among problem-focused coping strategies, seeking social support and communication seemed to be the most frequently performed as reported by several studies. Affleck and associated (1986 cited by Miles et al, 1996: 46) studied perceived social support and maternal adaptation during the transition from hospital to home care of high-risk infants. They found that mothers of infants with more worrisome conditions

exhibited more positive adaptation when they satisfied with the support they received. Moreover, Affleck and associates (1991: 23-24) questioned parents at the NICU discharge about the type of coping strategies they had used during the infants' hospitalization. Results showed that the highest proportion of coping strategies were seeking social support and looking for meaningfulness in the NICU experience. Hughes and associated (1994: 1-14) studied parental coping efforts during the initial weeks of their preterm infants' hospitalization in NICU. Thirty-two mothers and 25 fathers participated in the study. Utilizing procedure developed by Lazarus and Folkman (1984) in which coping is linked with a specific stressful event, parents reported what they did to cope with the stressor they perceived to be the most stressful. Results showed that both mothers and fathers relied primarily on the coping strategies of communication and seeking social support. Holditch-David and Miles (2000: 13-21) interviewed 31 mothers when their infants were six months of age corrected for prematurely and were analyzed using the Preterm Parental Distress Model as the conceptual framework. These mothers clearly found that their pre- and perinatal experience provided a context for their interpretation of the NICU experience. Health care providers and especially nurses can have a major role in reducing parental distress by maintaining ongoing communication with parents and providing competent care for their infants. Young-Seideman and colleagues (1997: 175) reported that most helpful subscale items were being able to telephone, immediate attention to their child's changes, being informed of progress. The mothers appreciated simple explanations from the physicians but often depended on the nurses for clarifications to reduce the stress throughout the hospitalization. They benefited for bedside teaching, demonstrations of care, and provision of written materials (Wereszczak, et al., 1997: 37).

Miles and others (1996: 45-52) studied sources of support reported by mothers and fathers of infants hospitalized in NICU at one week after infants' admission in NICU (T1), and at one week after initial interview (T2). They found that the parents indicated having a moderately high level of support available to them during this difficult period. The highest source of support for mothers at T1 and T2 was the baby's fathers, with the nurses in the NICU being the second most important sources of support. For fathers, at T1, the nurses in the NICU and the baby's mothers were the highest source of support, followed by the doctors in the NICU and the father's

parents. At T2, the baby's mother was the highest source of support for the fathers, followed by the nurses in the NICU and the NICU doctors. This suggests that nurses in NICU have an important role to helping both mothers and fathers cope with their infants' hospitalization. The results differ from the results of Pederson and colleagues (1987 cited by Miles et. al 1996: 45-46) in which neonatologists and nurses were rated low. The finding that mothers view the baby's fathers as a vital source of support is similar to Affleck and others (1991 cited by Miles, et. al 1996: 49) and Pederson and colleagues (1987 cited by Miles et. al 1996: 45-46) in which the husband, the mother's own parents, and the church were viewed as major source of support during this crisis period. Moreover, there were more three strategies that assisted mothers throughout the hospitalization: downward comparison, search for meaning in the crisis, and normalization. Using downward comparison, mothers found solace in thinking that their infant was better of than other infants or in hearing anecdotes of smaller and sicker infants surviving. They obtained this knowledge from the staff, by witnessing situations in the NICU, and by talking with other parents in the waiting room during their visits (Wereszczak, et al., 1997: 19).

In addition, supportive cares by NICU nurses help mothers for both giving information that helped mothers perform problem-focus coping strategies, and sharing empathy for their emotional-focus coping at the same time. Most mothers fondly recalled the emotional support, positive attention, respect, and encouragement they received from the staff, especially nurses who demonstrated warm and concern demeanors (Wereszczak, et al., 1997: 37). Mothers wanted ongoing communication about the infants and the medical status-information that is accurate, current, and comprehensive but not unduly permistic. NICU nurses assumed particularly important roles in communicating with parents. Nurses also need to remembered that listening was as important as giving information.

Summary of Literature Review

The birth of premature infants and their hospitalization in NICU is a significant stressful event for the mothers and the family (Boardman, 1995; O'Brien, et al., 1995 cited by Lau, 2001: 51). Mothers experienced both physical and emotional stress due to delivery exhaustion, lack of sleep in the hospital, and seeing another mothers with

their infants. Moreover, mothers may experience feelings of guilt for the premature birth, as though they were responsible for the outcome of the pregnancy (Callahan, et al., 1983 cited by Lau, 2001: 51). Apart from blaming themselves for the premature birth, the mothers may feel guilty over their inability to provide immediate care for their infant due to immediately separation after birth because of the infants' illness (Whettsell & Larrabee, 1988 by Lau, 2001: 51). By the time that mothers expand maternal identity in postpartum periods by taking visit and try to provide care for the infants, mothers experienced more stressors in NICU. Those are categorized into three aspects. That is, sights and sounds, infant's appearance and behavior, and maternal role alteration. Even though the factors that affect maternal stress levels are varied, they include personal factors: maternal age and education; family income; and perceived infants' illness severity. Maternal coping strategies processed through primary and secondary appraisal and associated with prior stress and coping experienced.

Although there were many studies that reported stress and coping of mothers of premature infants hospitalization in NICU, most of them conducted in western context. However, in Thailand there has been very little publication related to maternal stress and coping in the context of NICU. There is no such research studying stress and coping of mothers of infants hospitalized in NICU in the first week of admission and, especially, maternal perception about effectiveness of coping. Therefore, this study aimed to examine stress and coping strategies of mothers of premature infant hospitalization in NICU and maternal perception of coping effectiveness, using Transactional Model of Stress and Coping as a conceptual framework.

CHAPTER III

MATERIALS AND METHODS

This descriptive study aimed to describe maternal stress, relationships between maternal stress and related factors; maternal age, maternal education, family income, and perceived infant's illness severity, coping strategies and their perceived effectiveness of mothers of premature infants hospitalized in NICU.

Population and Sampling

The population of this study was mothers of premature infants hospitalized in NICU recruited from Songklanagarind and Hatyai Hospital.

The inclusion criteria used in selecting the sample were women who:

1. gave birth at gestational age less than 37 weeks and an infant was hospitalized in NICU for 2-7 days with high technology for survival,
2. visited the infant in NICU at least once,
3. were able to speak and understand Thai language,
4. agreed to participate in this study,
5. no psychological distress after giving birth.

Sample size

Purposive sample was used in this study based on the above criteria. The sample size was calculated by Yamane's (1973: 125).

$$n = \frac{N}{1+Ne^2}$$

n = sample size, N = population size, and e = accepted error (.05)

Due to the data collection period of this study that would be during February to April 2005, the researcher reviewed birth rate of premature infants hospitalized in

NICU of both settings during the same period of the year 2004. The recorded number was 66.

A calculation for sample size was:

$$\begin{aligned}n &= \frac{66}{1+(66 * .0025)} \\ &= 56.65\end{aligned}$$

Thus, the number of subjects in this study was 60.

Data were collected in a six-month period from February to July 2005.

Setting

The Neonatal Intensive Care Unit (NICU) of Hatyai and Songklanagarind Hospital, the major tertiary care and referral hospitals, are located in Hatyai district, Songkhla province in the lower parts of Southern region of Thailand. They were chosen as the sites for conducting this research because they provide care for critical ill newborns, needing intensive care in a period of dependence on high technology for survival. Both settings focus on maternal-newborn attachment and family-centered care concept as a guideline of care for this area. Thus, being with and/or taking care for their infants are always welcomed for parents. Both settings have two zones of care, critical care and intermediate care zone, with the purpose of proper management for care of the infants. The first area is the critical care zone for critical infants with an advanced module of treatment including incubator, ventilator, oxygen therapy, and/or monitored equipment etc. The second area is the intermediate care zone for the non-critical infants. Parents would be encouraged to form parental-newborn attachment through the promotion of parental role behaviors including cuddling, feeding, bathing, and/or changing diapers etc. Doctor visit schedule is twice a day; morning and evening, and there is an on call doctor standing by for 24 hours at the units in case of emergency. The nurse rotation is an eight-hours-shift: 8.00 am – 4.00 pm, 4.00 – 12.00 pm, and 12.00 pm - 8.00 am. Nursing system is case method for both settings; with ratio of nurses to infants is 1: 2-3, and joint with functional method at Songklanagarind Hospital. For the

first visit, parents will be oriented and informed about infant's appearance and behavior, the high technology equipment surrounding their infant, and treatment by the nurse who provides care for their infants in that shift. They then are approached and informed about the infant's progress and changes in health status every visit.

Instruments

The instruments used for data collection were composed of five parts as follows (Appendix A)

1. Maternal Demographic Characteristics Form. This was developed by the researcher. It included maternal age, religion, marital status, education background, occupation, total family income, economic status, type of medical payment, family characteristics, gravida, hospitalization during pregnancy, and day of infant's hospitalization at the time of data collection.

2. Perceived Infant's Illness Severity Scale. This was a 10-centimeter-standard-ruler rating scale. There was a horizontal, straight line divided by vertical line into 10 sections. There was a number to indicate each section from 0 at the left end to 10 at the right end of the line. The subject marked a cross through the line, corresponding maternal perception of infant's illness severity at the moment of visiting their infants in NICU, with 0 represent "not severe at all", and 10 represented "the most severe". The higher score means the higher level of maternal perception of infant's illness severity.

According to criterion references because of the purposive sampling for this study, level of perceived infant's illness severity scores left the "not severe at all" scale out, was classified into three levels by equal range of scores as follow:

Mild level referred to the mean scores of 1.00-4.00

Moderate level referred to the mean scores of 4.01-7.00

Severe level referred to the mean scores of 7.01-10.00

3. Infant Clinical Data Form. This was developed by the researcher. It included sex, gestational age, birth weight, and medical diagnosis.

4. The Parental Stressor Scale: NICU (PSS: NICU). The instrument was developed by Carter and Miles (1982, 1989 cited by Miles, et al., 1993: 149). It was used to measure parental perception of stressors arising from the physical and psychosocial

environment of the NICU. Forward only technique was used in translating into the Thai language and change the word specify to maternal stress by the researcher. The scale consisted of two parts. Part one is 28-item checklist, consists of three subscales including sights and sounds (six items), infant appearance and behavior (thirteen items) and, maternal role alterations (nine items). Each item represents the stressor experienced by the subjects. If the subjects have the experience, they will evaluate the severity of maternal stress on a 5-point Likert-type scale from 1 to 5, with 1 = not at all stressful, 2 = a little stressful, 3 = a fair bit stressful, 4 = a lot stressful, and 5 = a great deal stressful. The possible range for the item response is from 1 to 170. Part two is an open-end question about other stressful events in NICU according to maternal perception.

To calculate the average score for total/subscale maternal stress, every item that subjects perceived stress are summed together and divided by the number of those items in order to keep the score on the same numeric 1 to 5 scales. The higher scores indicate higher maternal stress.

According to criterion references because of the purposive sampling in this study, level of maternal stress scores was classified into three levels by equal range of scores as follows:

Mild level referred to the mean scores of 1.00-2.32

Moderate level referred to the mean scores of 2.33-3.66

Severe level referred to the mean scores of 3.67-5.00

Validity and Reliability

The PSS: NICU was originally adapted from the Parental Stressor Scale: PICU (PSS: PICU) developed by Carter and Miles. The instrument was altered to reflect stressor in four major areas: (a) those associated with the appearance and behavior of a premature infant, (b) changes in parental role that differ for parents of sick infants, (c) differences in the routines and environment of the NICU, and (d) parental relationship with staff on the unit. The first revision of the instrument was given to 10 professionals (neonatal nurses and doctors) and 20 parents of infants recently discharged from a NICU. The revised 73 item neonatal instrument was then given to 58 parents of infants hospitalized in one of two NICUs (Miles, et al., 1993: 149).

The content of the PSS: NICU was altered based on the data analysis from this pilot study and the input of additional content experts (experienced NICU nurses and a

maternal-child nursing educator), a professional editor, and a psychometrician. Items considered important by the content experts were evaluated for relevance, resulting in a 46-item scale. All items were again carefully evaluated for clarity and simplicity by content experts and a professional editor (Miles, et al., 1993: 149).

Psychometric evaluation were examined by 190 parents (115 mothers and 75 fathers) of premature infants hospitalized in three NICUs located in the Midwestern and southeastern United States and two ICUs located in Canada. This strengthened the clinical sensitivity of the instrument, providing two possible methods of scoring the stress of parents: The Stress Occurrence Level (Metric 1) and the Overall Stress Level (Metric 2). The Stress Occurrence Level (Metric 1) is the level of stress experienced by parents related to their particular situation, in which case only those who have had the experience receive a stress score on the item. The Overall Stress Level (Metric 2) is the overall level of stress engendered by the NICU environment, in which case all individuals receive a score on the item, with those not having the experience receiving a 1, indicating no stress was experienced. Most psychometric analyses were performed using both metrics. The choice of a metric and justification for its choice are presented for each analysis (Miles, et al., 1993: 149-150).

For the structural analyses, the relationships among the stress assessments are of more interest than those among frequencies of occurrence. The most appropriate approach seemed to be elimination of items that were only rarely experienced, and use of a substitution algorithm for remaining nonexperiencers. A liberal elimination criterion was set. If two thirds of more of the parents had not experienced the item, it was detected. This consisted of all items in the “staff relationship” area, five items related to the baby, and four items related to parental role alteration. Two-step regression procedures were used to estimate values for nonoccurrence on the remaining items (Miles, et al., 1993: 150).

Principal components analysis with the varimax rotation was used to analyze the items. The final version the PSS: NICU consisted of 26 items, the items were grouped into three subscales: Infant Appearance and Behavior (thirteen items), Parental Role Alteration (seven items), and. Sights and Sounds (six items). The internal consistency reliability of the retained subscales, as measured by the Cronbach alpha coefficients were acceptable, ranged from .73 to .92 and the standardized alpha for the entire scale

were quite good, .94 and .89 for Metric 1 and 2, respectively (Miles, et al., 1993: 150-151).

Pearson correlations were calculated interscale correlation among the three subscales of the PSS: NICU and between these subscales and the total scores using both Metric 1 and 2. In general, the scales were moderate correlated with one another (sharing from 12% to 40% of their variance in common) and strongly correlated with the total scores on the instrument (sharing from 49% to 82% of their variance). In evaluating the construct validity of the scale, Pearson correlations coefficients were computed between each of the scores on the PSS: NICU scales and State Anxiety scores. All of the correlations were significant ($p < .001$ in all cases except for the Sights and Sounds scale, $P < .05$) (Miles, et al., 1993: 151).

In 2002, Miles added 4 starred items on infant appearance and behavior and on parental role alteration; the number of total questionnaire was 34-item. These eight starred items have not been test psychometrically yet. If two thirds of more of the parents had not experienced the item, it was eliminated (Miles, 2002).

For this study, the content validity for the Thai version (34 item) was evaluated by five experts; one neonatologist, one registered nurse with NICU experience for more than 20 years, and three nursing instructors; one experienced in caring for premature infants, one experiencing NICU study, and the other experiencing in pediatric nursing studies for more than 20 years. This instrument was tested with 15 mothers whose premature infants hospitalized in NICU at Hatyai Hospital, but not the subject group. Six items of eight starred items were eliminated because two thirds of the subjects did not experience. This consisted of all items in the subscale of Infant Appearance and Behavior and two items related to Parental Role Alteration. Finally the total items were 28. The reliability by Chronbach coefficient alpha was .96. When this tool was used with 60 subjects, the reliability was .93.

5. The Thai Coping Scale. This instrument was developed by Hanchanchaikul, C. (1999: 59-139). Forward only technique was used in translating into the Thai language by the researcher. It is a 39-item scale. Item number 1-38 were loaded onto two categories of coping; 10 problem-focused coping and 28 emotional-focused coping items. For the last item, it is an open-end question about other coping strategies performed by the subjects. The Thai Coping Scale was used to measure two themes of

maternal coping. That is 1) occurrence of performed strategies, and 2) maternal perception for each performed strategies.

1) occurrence of coping strategies: for this theme, each item represents the coping strategies performed by the subjects, and is classified into two categories; not performed and performed. To complete this theme, the subjects marked a check between two choices. If the subjects did not perform that strategy, she did not need to rate its effectiveness.

2) maternal perception for each performed strategies: this theme was 5-point Likert-type scale from 1 to 5, with 1 = not effective, 2 = a little effective, 3 = a fair bit effective, 4 = a lot effective, and 5 = a great deal effective. The subjects marked a check among those five choices on every performed strategy. Higher scores indicated higher effectiveness according to maternal perception.

According to criterion references because of the purposive sampling in this study, level of perceived effectiveness of coping strategies scores was classified into three levels by equal range of scores as follow:

Low level referred to the mean scores of 1.00-2.32

Moderate level referred to the mean scores of 2.33-3.66

High level referred to the mean scores of 3.67-5.00

Validity and Reliability

The Thai Coping Scale was originally developed from an in-depth interview with 12 Thai family members of critical ill patients, and an extensive review of the literature, is a 44-item instrument with two sub-scales: problem-focused coping and emotion-focused coping. The tool is used to assess situation-specific coping (coping strategies of Thai families when facing critical illness of their beloved ones). The 53 coping strategies were selected based on qualitative inquiry, a comprehensive and critical review of the literature on stress, coping, and critical illness, and a Jalowice Coping Scale. Degree of use of the coping strategies was rate on a 1 (never use this strategy) to 4 (always use this strategy) Likert scale. The higher scores indicates the greater the use of coping strategies. After a review by a panel of five Thai nursing experts, the questionnaire was given to a non-random, purposive sample of 205 family members of adult critically ill patients admitted to the intensive care units (coronary and intermediate ICU, cardio-thoracic ICU, respiratory ICU, neurological ICU,

general surgical ICU, medical ICU, and traumatic ICU) of a hospital in Thailand. Overall, the content validity was substantiated by the systemic manner of tool development, by the large number of items use to tap the domain, and by the inclusion of diverse coping strategies. Moreover, it was based on consensus judgements by a panel of five Thai nursing experts; three of the nurses are doctoral prepared experts in nursing science and psychosocial nursing, and the others are master prepared experts in critical practice. All the experts were given guidelines for judging the appropriateness, accuracy, and representativeness of the items. They were asked to link the relevance of the items to the construct of interest. They independently rated the relevancy of each item to the operational definition using a 4-point scale: (1) not relevance, (2) somewhat relevance, (3) relevance, and (4) quite relevance. Items rated 3 or 4 will be retained. Those rated 1 or 2 will be deleted. Modifications of the items were made in response to the experts' judgement on the clarity, the sequence, and the appropriateness. Finally, by the content validity Index (CVI) calculated for each item. This step resulted in eliminating nine items, and retaining 44 items. Satisfactory internal consistency of the items was found. Chronbach alpha coefficients ranged from 0.80 (for the total score) to 0.77 and 0.70 (for emotion-focused coping and problem-focused coping, respectively).

Two varieties of factor analyses also provided a powerful method for constructing validation. Explanatory factor analysis (EFA) yielded eight factors. These eight factors were explained by two dimensions of coping, problem-focused and emotion-focused coping, as determined by confirmatory factor analysis (CFA). The results showed that all 44-items were loaded onto eight categories of coping. These eight categories of coping described by two functions of coping proposed by Lazarus and Folkman (1984: 141-157), problem-focused coping and emotional-focused coping. These categories were Factor 1, religious/spiritual/diety related/supernatural strategies, Factor 2, information seeking, Factor 3, avoidance/distancing/intrapsychic strategies, Factor 4, acceptance/problem solving skills/seeking positive value from the events, Factor 5-expressing anger, Factor 6, controlling and concentration, Factor 7, minimization and sharing, Finally, factor 8, smoking/alcohol/medication (Hanchanchaikul, C., 1999: 59-139).

For this study, the content validity for The Thai Coping Scale (44 items) was evaluated by five experts; one neonatologist, one registered nurse with NICU experience for more than 20 years, and three nursing instructors; one experienced in caring for premature infants, one experiencing NICU study, and the other experiencing in pediatric nursing studies for more than 20 years. According to the suggestion of the validators, four items were eliminated, the total items were 40. The MCS is tested with 15 mothers of premature infants hospitalized in NICU at Hatyai Hospital, but not the subject group. Two items of the Thai Coping Scale (“being smoking more than you ever did” and “drinking alcohol more than you ever did”) were eliminated because there is only one respond among 15 questionnaires, finally the total items were 38. For occurrence of performed strategies theme, the reliability by Kuder-Richardson was .89. When this tool was used with the sampling group, the reliability was .84. For maternal perception for each performed strategies theme, the reliability by Chronbach alpha coefficients of the non-sampling and sampling group were .89 and .86 respectively.

Protection of Human Rights

The data were collected after the approval from the Faculty of Graduate Studies, Mahidol University, the Committee on Human Subjects, Faculty of Medicine, Songklanagarind Hospital, Prince of Songkla University, and the director of NICU, Faculty of Medicine, Songklanagarind Hospital, Prince of Songkla University, and Hatyai Hospital.

The human right of the subjects is respected in this study (Appendix B). Eligible subjects are individually approached to participate in this study. The study objectives, the data collection processes, expected outcomes, subject rights, the type of questionnaires, length of time for completing the questionnaires, and the rights to decline or to withdraw from the study at anytime were explained. The subjects who agreed to participate are assured that the data will be kept confidential, and reported as group data. Their names were not attached to the data. A code number was used in the questionnaires instead. There was no known risk by participants in this study. There was no cost for, nor was there any payment to participants in this study. Verbal explanations were given when there are questions about the study.

Data collection

The letter of permission from the Dean of the Faculty of Graduate Studied, Mahidol University was submitted to the director of two hospitals, in order to explain the objectives and processes of the study and ask for cooperation in collecting data. The steps of data collection were as follows:

1. The researcher contacted and requested permission from the head of NICU of two hospitals and explained the objectives and processes of the study.
2. All eligible subjects who met the criteria were approached and the protection of human rights was explained, as previously described.
3. After the mothers agreed to participate in this study, the subjects completed the Demographic Data Form and the Clinical Data Form was completed from the infant's record by the researcher.
4. The researcher explained to the subjects how to complete the questionnaires, including the Perceived Infant's Illness Severity Scale, the PSS: NICU and the Thai Coping Scale. During this process, the researcher provided more information and clarification to the subjects if needed. The researcher then checked the missing data by discussing the questionnaires with them, and resolved any problem regarding their accurate completion.
5. The researcher loudly read the questionnaires verbatim to any participants experiencing difficulties in reading and writing, not more than 3 times, a pause was given for her to answer, and then completed the questionnaires according to the subject's decision. The subjects could answer the interview questions either verbally or in writing.

Data Analysis

The Statistical Package for Social Sciences for Windows Program (SPSS/FW) Version 11.5 was used for analysis.

1. Maternal demographic characteristics, perceived infant's illness severity scores, infant clinical data, and maternal stress scores were analyzed by using descriptive statistics: frequencies, percentage, medians, means and standard deviations.

2. Pearson's correlation coefficients was used to analyze the correlation between maternal stress and maternal age and perceived infant's illness severity.

3. Spearman's rho correlation coefficients was used to analyze the correlation between maternal stress and maternal education and family income.

4. Maternal coping strategies and their perceived effectiveness were presented with frequencies, percentage, means and standard deviations.



CHAPTER IV

RESULTS

This descriptive research was conducted to describe maternal stress, related factors, coping strategies and their perceived effectiveness of mothers of premature infants hospitalized in NICU. The findings from this study were presented in three parts, as follows;

- Part I Maternal demographic characteristics and infant clinical data
- Part II Maternal stress and related factors
- Part III Maternal coping strategies and their perceived effectiveness

Part I Maternal Demographic Characteristics and Infant Clinical Data

Maternal demographic characteristics

Maternal demographic characteristics were presented in Table 1. The numbers of the subjects from Hatyai and Songklanagarind hospital was 37 (61.70%) and 23 (38.30%) respectively. Their ages ranged from 16 to 43 years ($\bar{X} = 28.88$, S.D. = 7.51), with the majority of being 25 to 40 (66.67%). Most of them were Buddhist (80.00%). Ninety three point three three percent of the subjects were married. The largest groups of the education level were high school (48.33%). By Occupation, 40% of the subjects were agriculturists. The family income per month ranged widely from 3,000 to 50,000 baht ($\bar{X} = 13,593.33$, S.D. = 10,000.67, median = 10,000). Forty-eight point three percent of the families had an income higher than expenses. The majority of the subjects reimbursed their medical expenses from social insurance or health insurance (63.33%). More than half of the subjects lived in the nuclear family (56.67%). Forty-one point six seven percent of the subjects were primigravidarum and 45% experienced the hospitalization during pregnancy. Maternal perception for level of infant's illness severity varied from 0 to 10 ($\bar{X} = 5.88$, S.D. = 2.73), with nearly half of the subjects perceived moderate stress level (46.67%). Most of day of infant's hospitalization at the time of data collection was two days (38.33%).

Table 1. Maternal demographic characteristics (n = 60)

Characteristics	Frequency	Percent
Hospital		
Hatyai	37	61.70
Songklanagarind	23	38.30
Age (years)		
16-24	17	28.33
25-40	40	66.67
41-43	3	5.00
Min = 16 Max = 43 \bar{X} = 28.88 S.D. = 7.51 Median = 29.5		
Religion		
Buddhism	48	80.00
Islam	12	20.00
Marital status		
Married	56	93.33
Single	2	3.33
Divorced/Separated/Widow	2	3.33
Education background (years)		
None (0)	1	1.67
Elementary school (1-6)	13	21.67
High school (7-12)	29	48.33
Diploma (14)	5	8.33
College/Bachelor (16)	12	20.00
Min = 0 Max = 16 \bar{X} = 10.33 S.D. = 4.09 Median = 9		

Table 1. Maternal demographic characteristics (continued)

Characteristics	Frequency	Percent
Occupation		
Agriculturist	24	40.00
Unemployed	15	25.00
Employee	9	15.00
Government officer	8	13.33
Business owner	4	6.67
Total family income (Baht/month)		
3,000-5,000	13	21.67
5,001-10,000	22	36.67
10,001-50,000	25	41.67
Min = 3,000 Max = 50,000 \bar{X} = 13,593.33		
S.D. = 10,000.67 Median = 10,000		
Economic status		
Income higher than expenses	29	48.30
Income equal to expenses	24	40.00
Income lower than expenses	7	11.70
Medical payment		
Social insurance/health insurance	38	63.33
Government insurance	8	13.33
Self paid	8	13.33
Partially self paid, partially social welfare	6	10.00
Family characteristics		
Nuclear	34	56.67
Extended	26	43.33
Gravida		
1	25	41.67
2-3	27	45.00
4-6	8	13.33

Table 1. Maternal demographic characteristics (continued)

Characteristics	Frequency	Percent
Hospitalization during pregnancy		
Yes	27	45.00
No	33	55.00
Perceived infant's illness severity		
Not severe at all (0)	3	5.00
Mild level (1.00 – 4.00)	8	13.33
Moderate level (4.01 – 7.00)	28	46.67
Severe level (7.01 – 10.0)	21	35.00
Min = 0 Max = 10 \bar{X} = 5.88 S.D. = 2.73		
Day of infant's hospitalization at the time of data collection		
2	23	38.33
3-5	19	31.67
6-7	18	30.00
Min = 2 Max = 7 \bar{X} = 3.98 S.D. = 1.98 Median = 3.5		

Infant clinical data

Among 67 infants, 42 were males and 25 were females, with widely ranged from 26 to 36 weeks of gestational age (GA) (\bar{X} = 32.9, SD = 2.64, Median = 33). Similarity to GA, birth weight ranged from 740 to 2,500 grams (\bar{X} = 1,640.17, SD = 441.25, Median = 1,745). When classified by medical diagnosis, the majority of the infants were low birth weight, perinatal asphyxia and very low birth weight (58.21%, 34.33%, and 31.34% respectively). The details were showed in Table 2.

Table 2. Infant Clinical data (n = 67)

Clinical data	Frequency	Percent
Sex		
Boy	42	62.69
Girl	25	37.31
Gestational age (weeks)		
26-27	2	2.99
28-32	23	34.33
33-36	42	62.69
Min = 26 Max = 36 \bar{X} = 32.9 S.D. = 2.64 Median = 33		
Birth weight (grams)		
740-1,000	7	10.45
1,001-1,500	21	31.34
1,501-2,500	39	58.21
Min = 740 Max = 2,500 \bar{X} = 1,640.17 S.D. = 441.25 Median = 1,745		
Medical diagnosis		
Low birth weight	37	58.21
Perinatal asphyxia	23	34.33
Very low birth weight	21	31.34
Maternal PROM	17	25.37
Respiratory distress syndrome	16	23.88
Hypothermia	11	16.42
Hypoglycemia	9	13.43
Twins	8	11.94
Extremely low birth weight	7	10.45
Others	14	20.89

Part II Maternal Stress and Related Factors

Maternal stress is based on the 3 ranges of scores set up for determination of stress level in Chapter 3. The means scores for both total maternal stress and for each subscale were at a moderate level ($\bar{X} = 2.86$, S.D. = 0.92, $\bar{X} = 2.55$, S.D. = 1.04; $\bar{X} = 3.02$, S.D. = 1.01, and $\bar{X} = 3.03$, S.D. = 1.03 respectively) as shown in Table 3.

Table 3 Possible range, actual range, means, standard deviations, and level of maternal stress scores (n = 60)

Maternal stress	Possible range	Actual range	\bar{X}	S.D.	Level
Subscale					
Sights and Sounds	1-5	1-4.8	2.55	1.04	Mod
Infant Behavior and Appearance	1-5	1-50	3.02	1.01	Mod
Maternal Role Alterations	1-5	1-50	3.03	1.03	Mod
Total maternal stress	1-5	1-4.93	2.86	0.92	Mod

The research hypothesis concerns the possible relationships between maternal stress and maternal age, maternal education, family income, and perceived infant's illness severity. Data from maternal age and perceived infant's illness severity scores were normal distribution, so Pearson's correlation coefficients was used to determine the relationships among these variables. Results were reported in Table 4. Maternal stress was significantly and positively correlated with perceived infant's illness severity ($r = .306$, $p < .01$). On the contrary, there was no significant relationships between maternal stress and maternal age ($r = .113$, $p > .05$).

Table 4. Pearson's correlation coefficients between maternal stress and maternal age, and perceived infant's illness severity (n=60)

Maternal stress correlated with	r
Maternal age	.113 ^{NS}
Perceived infant's illness severity	.306*

* $p < .01$

Data from maternal education and family income scores were non-normal distribution, so Spearman's rho correlation coefficients was used to determine the relationships among these variables. Results were reported in Table 5. There were no significant relationships between maternal stress and maternal education and family income ($r = -.012$ and $.168$, all $p_s > .05$)

Table 5. Spearman's rho correlation coefficients between maternal stress and maternal education and family income (n=60)

Maternal stress correlated with	r
Maternal education (years)	-.012 ^{ns}
Family income	.168 ^{ns}

ns $p > .05$

Part III Maternal Coping Strategies and their Perceived Effectiveness

In which mothers experienced stress, they were asked to mark a check on coping strategies. Subjects always marked more than one response. Coping strategies were classified into two categories: problem-focused and emotional-focused coping strategies based on Lazarus and Folkman (Lazarus and Folkman, 1984: 141-157). In this study, the subjects performed combination of coping strategies. As a whole, all items of problem-focused coping strategies were performed and the mean scores of perceived effectiveness to lower stress were at a moderate level. Being trying to seek information about infant's illness and treatment from nurses firstly (96.67%), and secondly (91.67%), doctors were the two most frequently performed problem-focused coping strategies, and subjects perceived them as the most effective way to lower stress. Their mean scores of perceived effectiveness to lower stress were the highest among all items ($\bar{X} = 3.59$, S.D. = 1.11, and $\bar{X} = 3.55$, S.D. = 1.31 respectively). Whereas, the two lowest mean scores that the subjects perceived effectiveness to lower stress were "being prepare oneself in case something serious happens to infant" and "being try to tell oneself that do not know what will happen and need time to evaluate this situation" ($\bar{X} = 2.61$, S.D.= 1.64 and $\bar{X} = 2.38$, S.D.=1.46 respectively). Notably, although mean scores were the lowest, but about a half of the subjects performed these strategies as shown in Table 6.

Table 6. Frequencies and percents of problem-focused coping strategies and their perceived effectiveness of mothers of premature infants hospitalized in NICU, ranking from the highest effectiveness

Coping strategies	n	% used	Perceived effectiveness		
			\bar{X}	S.D.	level
Being try to seek information about your infant's illness and treatment from nurses	58	96.67	3.59	1.11	Moderate
Being try to seek information about your infant's illness and treatment from doctors	55	91.67	3.55	1.31	Moderate
Being concentrate in order to control this situation	53	88.33	3.45	1.41	Moderate
Being try to seek information about your infant's illness and treatment from others (friends or colleagues)	18	30.00	3.28	1.58	Moderate
Being accept your infant's illness (based on reality)	58	96.67	3.03	1.18	Moderate
Being try to solve the problem by dividing the problem into small pieces, and solve one piece at one time	51	85.00	2.92	1.37	Moderate
Being ask someone else to help you in this stressful situation	22	36.67	2.91	1.57	Moderate
Being solve problem by using your prior experience	18	30.00	2.83	1.39	Moderate
Being prepare yourself in case something serious happens to your infant	31	51.67	2.61	1.64	Moderate
Being try to tell yourself that you do not know what will happen and you need time to evaluate this situation	32	53.33	2.38	1.46	Moderate

In a whole feature, mothers perceived that two-third of the emotional-focus coping strategies they performed were effective to lower stress at a moderate level. The most frequently performed and mothers perceived to be the most effective to lower stress at a moderate to high level, was “being always have hope that infant’s illness will improve in the future” ($\bar{X} = 3.59$, S.D. = 1.08). Interestingly, among four of top five of the highest mean scores of perceived effectiveness, three of them were the items of religious/deity traditions. That is “being make merit through religious activities such as donating food, money, etc”, “being make a promise to spirits/deity/god if your infant’s illness improves (or is cured)”, and “being prostrate to spirits/deity/god” ($\bar{X} = 3.45$, S.D. = 1.86, $\bar{X} = 3.42$, S.D. = 1.94, and $\bar{X} = 3.41$, S.D. = 1.89 respectively).

Remarkably, strategies performed by the large number of the subjects did not indicate their effectiveness according to the subject’s perception. For example, “being feel tense” and “being feel anxious” were the top two most frequently performed of emotional-focus coping strategies (80-83.33%) in a group of items that the subjects perceived their effectiveness to lower stress only at a low level ($\bar{X} = 2.17$, S.D. = 1.39 and $\bar{X} = 1.88$, S.D. = 1.28 respectively). Whilst, “being bored/ agitated/nervous” was the strategies performed by the half of the subjects (50%), but its effectiveness was perceived at only a low level ($\bar{X} = 1.50$, S.D. = 0.97). In addition, items of negative response behaviors; “being get mad”, “being angry with somebody else who you think caused your infant’s illness”, and “being curse or swear”, were the three least frequently performed strategies (8.33%, 6.67%, and 1.67% respectively) and their mean scores of perceived effectiveness to lower stress were only at a low level ($\bar{X} = 2.00$, S.D. = 0.64, $\bar{X} = 1.50$, S.D. = 0.44, and $\bar{X} = 1.00$, S.D. = 0.30 respectively) as shown in Table 7.

Table 7. Frequencies and percents of emotional-focused coping strategies and their perceived effectiveness of mothers of premature infants hospitalized in NICU, ranking from the highest effectiveness

Coping strategies	n	%	Perceived effectiveness		
			\bar{X}	SD	Level
Being always have hope, that your infant's illness will improve in the future	59	98.33	3.59	1.08	Moderate
Being make merit through religious activities such as donating food, money, etc	38	63.33	3.45	1.86	Moderate
Being dream about your happiness	36	60.00	3.42	1.94	Moderate
Being make a promise to spirits/deity/god if your infant's illness improves (or is cured)	29	48.33	3.41	1.89	Moderate
Being prostrate to spirits/deity/god	49	81.67	3.38	1.58	Moderate
Being confide/tell one's trouble/talk/discuss with other infant's mothers	29	48.33	3.17	1.74	Moderate
Being release your stress to other people	29	48.33	3.17	1.77	Moderate
Being confide/tell one's trouble/talk/discuss your infant's illness with your friends	26	43.33	3.12	1.66	Moderate
Being sleep and hope that when you awake up, everything will be better	51	85.00	3.10	1.62	Moderate
Being take sleeping pills	2	3.33	3.00	0.57	Moderate
Being confide/tell one's trouble/talk/discuss your infant's illness among family members	53	88.33	3.00	1.46	Moderate
Being try not to think too much about this stressful event	50	83.33	2.94	1.52	Moderate

Table 7. Frequencies and percents of emotional-focused coping strategies and their perceived effectiveness of mothers of premature infants hospitalized in NICU, ranking from the highest effectiveness (continued)

Coping strategies	n	%	Perceived effectiveness		
			used	\bar{X}	SD
Being do not to think that your infant's illness is the crisis in your life	28	46.67	2.93	1.71	Moderate
Being think that your infant's illness is an opportunity for you to learn something (something come out of the experience)	49	81.67	2.86	1.48	Moderate
Being do something else in order to forget your infant's illness	34	56.67	2.82	1.64	Moderate
Being go to see a fortune-teller and ask her/him about your infant's illness	5	8.33	2.80	0.89	Moderate
Being try not to face your infant's illness	8	13.33	2.75	1.12	Moderate
Being try not to think about your infant's illness	36	60.00	2.72	1.64	Moderate
Being cry	42	70.00	2.71	1.59	Moderate
Being angry with something else which you think caused your infant's illness	5	8.33	2.20	0.70	Low
Being feel tense	48	80.00	2.17	1.39	Low
Being get mad	5	8.33	2.00	0.64	Low
Being feel anxious	50	83.33	1.88	1.28	Low
Being want to be alone	15	25.00	1.80	0.85	Low
Being work harder	4	6.67	1.75	0.45	Low
Being angry with somebody else who you think caused your infant's illness	4	6.67	1.50	0.44	Low
Being bored/agitated/nervous	30	50.00	1.50	0.97	Low
Being curse or swear	1	1.67	1.00	0.30	Low

CHAPTER V

DISCUSSION

In this chapter, maternal stress was initially presented and discussed, followed by a discussion of relationships between maternal stress and maternal age, maternal education, family income, and perceived infant's illness severity, and finally, coping strategies and their perceived effectiveness of mothers of premature infants hospitalized in NICU.

Maternal Stress

In this study, mothers experienced moderate level of stress during their infants' hospitalization (Table 3). The result was the same as the study of Yamanantakul, P. (1995: 44-58). Moreover, it was congruent with several studies which reported that mothers experienced moderate or high level of stress (Affonso, et al., 1992: 63-70; Beckman & Pokorni, 1988; Boukydis, et al., 1987 cited by Prudhoe & Peters, 1995: 140; Brunssen & Miles, 1996: 88; Feldman, et al., 2000: 279; Holditch-Davis & Miles, 2000: 16-18; Hughes, et al., 1994: 1-14; McCluskey-Fawett, et al., 1992 cited by Lau, 2001: 49-50; Miles, et al., 2002: 86; Shields-Poe, & Pinelli, 1997: 36). These might result from various factors. The important factor might be that there was an informal support group among mothers during visiting time. The subjects always exchanged the information and shared experiences about their infants' illness, and therapeutic management with each others. Most of all, they could release the feeling of stress, anxiety, worry, depression, or emotional strain. This might make them feel that they were not alone and lonely in this hard situation. Especially in the phase of infants' clinical instability, or in the critical period that urgent cares were needed, they would be the "encourager" to each other. Furthermore, they also received ongoing information from health professionals throughout their infants' hospitalization. This was congruent with the study of Wereszczak and colleagues (1997: 37) which reported that mothers obtained information from the staffs, by witnessing situations in

NICU, and by talking with other parents in the waiting room during their visits. Another factor was the readiness of the settings. As proposed in Chapter III, both Songklanagarind and Hatyai hospitals provided tertiary care for newborns with critical illness. The hospitals served enough health care team including neonatologists, NICU physicians, NICU nurses, and other supported teams with experiences, alertness, and willingness. Above all, it was the Thai tradition that most people had the sense of trust and faith in health care providers. In addition, both settings focused on maternal-newborn attachment and family-centered care concept as a guideline of care for these areas. In response to those concepts, being with and/or taking care for their infants were always welcome whenever mother needs. There were many ways to promote maternal role behaviors, for example: touching, cuddling, changing diaper, and holding feeding tube during feeding time. Nurse would be next to mother as a coach in her first few times of procedure until she could do it by herself. This might be the explanation for the moderate level of average maternal stress scores for the subscale of maternal role alteration in this study. Although many items in the subscale of parental role alteration, for example: can't feeding, can't provide care, can't hold my baby when I want, feeling staff is closer, and especially, being separated from my baby were proposed as the most stressful events in several studies (Affonso, et al., 1992: 66; Brunssen & Miles, 1996: 88; Miles, et al., 2002: 86; Holditch-Davis & Miles, 2000: 16-18), the average scores for maternal role alteration in this study was only 3.03. However, average scores for this subscale were the highest among three subscales. This was consistent with several studies that parental role alteration was the greatest source of parental stress during the infants' hospitalization (Affonso, et al., 1992: 66; Brunssen & Miles, 1996: 88; Miles, et al., 2002: 86; Young-Seideman, et al., 1997: 169-177; Wereszczak, et al., 1997: 35-37).

Interestingly, mean score for the last item of this subscale (Feeling staff is closer to my baby than I am) was only 1.97. This might be due to the cultural diversity. Child rearing pattern were different between western and eastern culture. Normally, western people were self-reliance, independent, and most of all, they perceived their own self-efficacy to control and manage their life events. Thus, mothers might feel very frustration when they could not provide care for their "own" infants as the NICU staff did. Furthermore, it interrupted maternal-newborn

attachment because mothers could not expand her maternal identities in post partum period. Previous study reported that parents have frequently commented to hospital staff that they felt frustrated that they are not the primary caregivers for their children during hospitalization period (Reichman, et al., 2000: 291). In contrary, for Thai tradition, people had the sense of trust and faith in health care providers, most mothers might feel more confidence to let NICU staffs provide most of cares for their infants. It was notably that data collection time ranged from the second to the seventh day of infant's hospitalization. Mothers who were interviewed in a latter time of their visit might have already been approach and given information about their infants' illness. Thus they might have processed through the phase of appraisal, coping, and reappraisal according to transactional model of stress and coping (Lazarus and Folkman, 1984: 293-306).

Seeing the infant's tiny size, and surrounded by countless tube, medical equipment, and machine in an unfamiliar environment of NICU was another stressor that mothers perceived as moderately high to high level (Affonso, et al., 1992: 66; Brunssen & Miles, 1996: 88; Miles, et al., 2002: 86; Young-Seideman, et al., 1997: 169-177; Johnson, 1983; Perlman, 1986 cited by Hughes, et al., 1994: 1; Pinelli, 2000: 27; Wereszczak, et al, 1997: 33). Thus, on the first visit, the nurse would orient and inform mother about infant's appearance and behavior, treatment, and the high technology equipments surrounded the infant. Mother had a right to ask for more clarification or any further information from the nurse. If it was not the nurse's role, mother would be provided the opportunity to discuss with the NICU physician or neonatologist. Moreover, mother would be approach and informed about the infant's progress in health status every visit. Intervention such as helping mothers understand and cope with technology surrounding the infants, painful and invasive treatments, and changes in the infant's appearance and behavior related to aspects of the infants' illness decrease maternal stress (Miles, et al., 2002: 86).

Considering by maternal demographic characteristics, marital status and sociocultural environment might be the major resources of support that lowered maternal stress. Most of the subjects (80%) were Buddhists which believed in Buddha's teaching that "birth, decay and death are the normal incidents of life". This state is the first truth (Dukkha) of the Four Noble Truths (Ariya-Sacca)

(www.dhammathai.org). The great majority of the subjects (93.3%) were married and all of them lived with their spouses that they could depend on when they needed somebody to be next to. Relying on family members for sometimes would be possible for the subjects because nearly half of them (45%) lived in extended family which was the normal pattern of lifestyle in the southern rural communities. This was congruent with the study of Prudhoe & Peters (1995: 144) which stated that parents were able to rely on their extended family for the needed help and support. In addition, prolong stress from hospitalization during pregnancy might increase stress when a pregnant gave birth to a premature infant. In this study, 55% of the subjects did not hospitalize during pregnancy. Besides, more than half of the subjects (58.3%) were not primigravida. Prior experience of being pregnant and caring for an infant might help mother feel less worry in perinatal phase. Furthermore, the day of infant's hospitalization at a time of data collection might affect maternal stress. The majority of participants (61.67%) completed the questionnaire on the third to the seventh day of infant's hospitalization, which might not be the first time that they saw their infants. They might have already appraised and reappraised every time of her visit according to a transactional model of stress and coping (Lazarus and Folkman, 1984: 293-306).

In this study, a 26 year old mother, three days post partum gave birth to extremely low birth weight premature infants with twins, 26 weeks of gestational age, weighing only 875 and 885 grams. Because of extremely low birth weight, they were taken to NICU immediately after birth. Incubators were provided for clinical observation and management of hypothermia. Both of them got severe respiratory distress syndrome, so ventilators were needed. One infant died within the first day of birth. Although experiencing so many stressors, mother reported only mild stress. Her average total maternal stress score was 2.27, and 2.00, 2.82, 2.00, for the subscale of sights and sounds, infant's appearance and behavior, and maternal role alterations respectively. She had taken three visits at the time of data collection.

Because of the low score for both total maternal stress and two subscales of sights and sounds and maternal role alterations, which did not get along with her stressors, the researcher then asked for permission to take further interview to explore the phenomenon. The additional information was as follow: "On their birth

date, the NICU physician told me that my babies were born too early. They were not ready to face the outside world. Their health statuses were very unstable – any changes could happen to them and they need very close-up care. Every body; physician, nurses, and other supportive staffs had been doing their best to help both of them survive. The first time I entered the unit, I saw many people working around, many babies in the incubators, and noises from the machine. Every thing was very chaos. It looked so harmful. I felt very tense”. As previously report, total scores for the subscale of sights and sounds was only 2.00. The researcher then explored why she rated only “a little stressful” for each item. “Because I was told about every thing; lung machine/medical equipment/tube/line - on and around my baby’s body/ and the necessities of each every visit. After that I understood more about the advantage of those, so I felt more relax”.

Notably, among three subscales, the score for infant’s appearance and behavior subscale was the highest, and was the only one subscale that mother perceived stress at a moderate level (2.82), and her feeling was as follow: “When I saw my baby, he was like a small kitty. His skin was very thin that every vessel seen, and there’re bruises on his hand-may be from the needle punctured for fluid line, and there’s abrasion on his left foot. I thought it’s certainly hurt him a lot, my pitiful boy. Besides, there were so many lines on and around him, especially tube for his breathing. He’s in a very dangerous condition. I didn’t know how to tell my feelings at that time - may be the most stressful event in my life. Until now, I still felt so hurt when I look at him”.

“After two more visits, I could touch and sense everything the physician previously told me, all of them had been doing their best to my baby. Especially the nurses; they did every thing to comfort my baby. They took good care not only for him, but they also support me, both physically and emotionally. They knew that I’d got a caesarian section; they took a seat for me to reduce the pain at my operative site. They also encouraged me to touch my baby, but I thought he’ll be safer in the nurses’ and physician’s hands. I thought my baby’s got the best of care, so whatever happens right now, I thought I could accept it”. This was her response to the low score (2.00) for the subscale of maternal role alteration.

Considering infants’ clinical data, the minority of the infants’ clinical manifestation was critical. Infant’s medical status might influence parental stress

levels. These included the infant's gestational age, birth weight, and length of NICU hospitalization (Affleck, et al., 1989a cited by Lau: 2001: 51). The earlier the gestational age and the lower the birth weight, the longer the length of hospital stay for the infant. Also seeing their infant on a respirator, attached to numerous monitoring equipments and being fed through tubes or intravenous infusion were the major sources of anxiety for parents (McCluskey-Fawett, et al., 1992 cited by Lau, 2001: 49-50). From Table 2, infants' average gestational age of 32.9 weeks, average birth weight of 1,640 grams, which were not very or extremely low birth weight, while normal full term newborn weight is at least 2,500 grams. When classified by medical diagnosis, the majority of the infants were low birth weight, followed by perinatal asphyxia and very low birth weight (58.21%, 34.33%, and 31.34% respectively). This was similar to Raeside's study (1997 cited by Lau, 2001: 64-65), which interviewed 12 mothers of infants in NICU with VLBW and LBW and found that mothers of VLBW reported higher stress levels than mothers of LBW. In this study, ELBW, VLBW infants, and infants with respiratory distress syndrome that usually need ventilators as a module of the treatment and mother perceived as the most critical illness were found only 23.88% of the infants (Table 2). In addition, there was 63.33% of the subjects reported that there was a machine (respirator) breathe for their infants. However, the average score of maternal stress for this item in the sights and sounds subscale was only at a moderate level, but it was the highest score ($\bar{X} = 3.50$, S.D. = 2.0) among six items in this subscale (Table 8, Appendix C). This might be the explanation of the moderate level of maternal stress.

Relationships between Maternal Stress and Maternal Age, Maternal Education, Family Income and Perceived Infant's Illness Severity

Maternal stress was significantly and positively correlated with perceived infant's illness severity ($r=.306$, $p<.01$) (Table 4). As mentioned earlier, infant's gestational age, birth weight, and medical diagnosis were not severe, consequently, nearly half of the subjects (46.67%) perceived infant's illness severity at a moderate level ($\bar{X} = 5.88$, S.D. = 2.73) (Table 1). The result was not congruent with other studies that uncertainty of infant's health status and severity of infant's illness caused a great deal of maternal stress and anxiety (Affonso, et al., 1992: 66-69; Brunssen &

Miles, 1996: 88; Catlett, et al., 1994:45-49; Holditch-Davis & Miles, 2000: 17; Hughes, et al., 1994: 6; Miles, et al., 2002: 86; Shields-Poe & Pinelli, 1997: 36; Wereszczak, et al., 1997: 36). This might be said that while feeling tense about her infant's illness, mother appraised that everything surrounded her infant including many staffs, high technology equipment and monitors, and/or needle/tube line on or near the infant was the therapeutic intervention for the best outcome of her infant health status.

On the contrary, there were no significant relationships between maternal stress and maternal age, maternal education, and family income ($r = .113$, $r = -.012$, and $r = .168$, all $p_s > .05$). A possible explanation might be that the majority of the subjects (75%) in this study were in early adulthood (25-40 years old) that might be mature enough to deal with stress. Persons with different ages do not perceive stress in the same way according to the developmental maturity (Gazde, 1971, Lazarus, 1996; Vaillant, 1971; cited by Garland & Bush, 1982: 11). Growing up through life span to early adulthood, the individual learns through experiences and achieve developmental maturation. A result of this study was consistent with the previous report that compared maternal stress between adolescent and adult mothers; research showed that adolescents did not fare as well as adults. Younger mothers rated the stressfulness in their lives as higher than did older mothers and reported an inability to deal with the stress (Garcia Coll, et al., 1987; Levine, et al., 1985; Schinke, et al., 1986 cited by Christopher, et al., 2000: 289). Additional finding was that in the NICU, younger mothers experienced higher levels of stress than did older mothers, and general psychological distress was the best predicted by younger maternal age.

Considering maternal education, the largest groups of maternal educated duration (48.33%) were high school level. Twelve years in school might be enough for individual to achieve basic skills of communication, process of thinking, and/ or understanding an uncomplicated phenomenon, for example: understanding information provided from health professions in care of infants' hospitalization, and/or what the staff told about the progress of their infants. In contrary, it might not be enough for complicated ones such as accessing the resource of knowledge and/or discussing about the infant's illness with the physician. The result of this study was

different from previous reports that mothers with a lower education level reported more worry about their infant's health (Miles, et al., 2002: 87; Warolarn, W.: 1992: 50-52).

In addition, the median of total family income were 10,000 baht per month. Forty-eight point three percent of the families had an income higher than expenses. The majority of the subjects (63.3%) reimbursed their medical expenses from social insurance or health insurance. This might be the explanation of lower maternal stress scores in this study. Hospitalization in the highly technical and critical care environment of NICU needed advanced investigation and close up care, which took high cost of treatment. Medical payment support by social, health, or government insurance, might lower maternal stress. Similar to the study of Mitrthongtae, J. (1989: 70) and Wicki (1999 cited in Lau: 2001: 51) that spouse of chronic ill patients with higher family income experience lower stress. On the other hand, medical payment problem also influences maternal stress and coping (Johnson, 1986 cited by Chaisom, P., 1993: 30).

Coping strategies and their perceived effectiveness

Stress was an unavoidable aspect of mothers of premature infant hospitalized in NICU. Recognition of sources of stress, lessened anxiety, and heightened feelings of personal competence were examples of adaptive outcomes that the nurse could help mothers achieve (Lamongtagne, et al., 1995: 216) In this study, subjects performed both problem-focus and emotional-focus coping strategies in response to stress which support to the Lazarus and Folkman (1984: 141-157). As a whole, all items of problem-focused coping strategies were performed and the mean scores of perceived effectiveness to lower stress were at a moderate level. The top two most frequently performed were "being try to seek information about infant's illness and treatment from nurses" (96.67%) and "being try to seek information about infant's illness and treatment from doctors" (91.67%). The mean scores of perceived effectiveness to lower stress were the highest among all items ($\bar{X} = 3.59$, S.D. = 1.11 and $\bar{X} = 3.55$ S.D. = 1.31 respectively) (Table 6). This was congruent with the study of Wereszczak and others (1997: 37) with reported that the mothers identified various supportive resources that reduced their stress throughout the hospitalization. They appreciated simple explanations from the physician but often depended on the nurses for

clarifications they benefited from bedside teaching, demonstrations of care and provision of written materials.

Furthermore, the result of this study was also similar to many previous reports that support of healthcare team has been found to be important in helping parents cope with their infant's and hospitalization. Most mothers fondly recalled the emotional support, positive attention respect, and encouragement they received from the staff, especially nurses who demonstrated warm and concerned behavior. The nurses did this by teaching mothers the normal behavioral cues of premature infants, by clothing the infant, and by nesting or swaddling the infant so that he would appear normal. Picking up on the nurse's cues, mothers normalized their infants by perceiving positive cues from them, by feeling concerned and necessary, and by watching the infant's growth curve and seeing the equipment disappear. The results were shown that most subjects appraised their infant's illness information as their coping resource to lower stress. (Affleck, et al., 1991 cited by Miles, et al., 2002: 83; Holditch-Davis & Miles, 2000: 19; Miles, et al., 1996: 50; Young-Seideman, et al., 1997: 174, Wereszczak, et al, 1997: 37). These could be stated that giving infant's information including health condition and progress of treatment to mothers was still a key point to help them cope with stress during their infant's hospitalization. The perceived support from the health care team suggested that mothers were highly satisfied with their encounters with the physicians, nurses, social workers, and others in the tertiary care hospital. It also indicated that nurses in this situation were perceived as providing emotional, informational, and esteems support frequently and were perceived as giving a high level of care to the sick infants.

The two lowest mean scores that the subjects perceived effectiveness to lower stress were "being prepare yourself in case something serious happens to infant" and "being try to tell yourself that you do not know what will happen and you need time to evaluate this situation" ($\bar{X} = 2.61$, S.D. = 1.64 and $\bar{X} = 2.38$, S.D. = 1.46 respectively). Notably, although mean scores were the lowest, but more than half of the subjects performed these strategies. As previously described that mothers who gave birth to premature infants lost the opportunities to prepare mentally for the motherhood (Lau, 2001: 49-50). They also perceived losses from early, abrupt

termination of pregnancy; feelings of guilt or failure about the inability to carry the pregnancy to term (Affonso, et al., 1992: 63). Combination of those might be appraised as maternal earlier stressor. Physiological instability and the uncertainty of the outcome of treatment of the infants might be added stressor perceived as threat according to maternal perception. Because of maternal limited coping resources at the second to the seventh day after birth in accordance with her exhaustion and post partum physical instability, mothers might be geared to those two forms of coping strategies although they perceived that they were effect to lower stress at only a moderate level.

In a whole feature, mothers perceived that two-third of the emotional-focus coping strategies they performed were effective to lower stress at a moderate level. The most frequently performed and mothers perceived to be the most effective to lower stress at a moderate to high level, was “being always have hope that your infant’s illness will improve in the future” ($\bar{X} = 3.59$, S.D. = 1.08). This might be associated with the marital status of the subjects. The great majority of the subjects (93.3%) were married and all of them lived with their spouses. It might be said that most of the infants were born by “expected pregnancy” so they were wished to be healthier day by day. Considering by day of infant’s hospitalization, 38.33% of the subjects completed questionnaire on the second day after birth which was still in the acute phase of infant’s illness. Furthermore, as mentioned earlier, it is the tradition of Thai society that most people have the sense of trust and faith in health care providers. This reassured them to hope that their infants’ health outcome would be recovered because of the health care team capability. According to Lazarus and Folkman (1984: 159), emotional-focused coping refers to specific coping strategies serve to regulate one’s emotional response to stress. It would be possible that in the early recovery phase of post partum women that loss much energy from labor, so coping in this phase may be geared toward minimizing energy expenditure.

Interestingly, among four of top five of the highest mean scores of perceived effectiveness, three of them were the items of religious/deity traditions; “being make merit through religious activities such as donating food, money, etc”, “being make a promise to spirits/deity/god if your infant’s illness improves (or is cured)”, and “being

prostrate to spirits/deity/god” ($\bar{X} = 3.45$, S.D. = 1.86, $\bar{X} = 3.42$, S.D. = 1.94, and $\bar{X} = 3.41$, S.D. = 1.89 respectively). The results of this study was consistent with those studies by Hughes, et al. (1994: 11) which revealed that approximately one third of the parents reported that they relied on their religious faith; by Affleck, and associates (1991 cited by Hughes, et al., 1994: 11) who found that one fourth of the mothers interviewed used prayer and religious faith as coping strategy; and by Pederson and colleagues (1987 cited by Hughes, et al., 1994: 2) which found that church (for church member) was viewed as a major source of supporting during the infants’ transition from hospital to home. It might be said that religious/deity beliefs was classical and effective emotional-focused coping for the person with any nationality. Existential beliefs, such as faith in God, fate, or some natural order in the universe, were general beliefs that enabled people to create meaning and maintain hope in difficult circumstances. They might be affectively neutral, but they could arouse emotion when they converged with a strong commitment in a particular encounter (Lazalus & Folkman, 1984: 56).

Remarkably, strategies performed by the large number of the subjects did not indicate their effectiveness according to the subject’s perception. For example, “being feel tense” and “being feel anxious” were the top two most frequently performed of emotional-focus coping strategies (80-83.33%) in a group of items that the subjects perceived their effectiveness to lower stress only at a low level ($\bar{X} = 2.17$, S.D. = 1.39 and $\bar{X} = 1.88$, S.D. = 1.28 respectively). Whilst, “being bored/agitated/nervous” was the strategy performed by the half of the subjects (50%), but its effectiveness was perceived at only a low level ($\bar{X} = 1.50$, S.D. = 0.97). Most of respondents’ explanation for these performed-items from additional interview was that “It’s autonomic reaction when I faced such events in NICU. I could not control it although it’s absolutely helpless to make me feel better”. As previously report that most of the subjects completed the questionnaire within the second to the seventh day of their infants’ hospitalization. The initial phase of stress experience, transaction might not be processed completely through cognitive process of a person. This might be the result of maternal physiological instability in postpartum period, the limited coping resources because mothers were still hospitalized, and the uncertainty of the infants’ medical status.

From Table 7, items of negative behaviors; “being get mad”, “being angry with somebody else who you think caused your infant’s illness”, and “being curse or swear”, were the least three frequently performed strategies (8.33%, 6.67%, and 1.67% respectively) and their mean scores of perceived effectiveness to lower stress were only at a low level ($\bar{X} = 2.00$, S.D. = 0.64, $\bar{X} = 1.50$, S.D. = 0.44, and $\bar{X} = 1.00$, S.D. = 0.30 respectively). As mentioned earlier, most of the subjects were Buddhist (80%), which had the religious beliefs of “birth, decay and death are the normal incidents of life” (www.dhammathai.org). This might help them calmly accepted their infant’s illness. Moreover, according to child rearing pattern in Thai tradition, expressions of negative behaviors were not allowed for females. These parental supervisions were gradually cultivated to manner, and turned to be value for women in Thai culture. Thus, it was not the surprisingly result for this study that only 10 respondents (16.67%) performed those strategies.

In conclusion, mothers of premature infants hospitalized in NICU experienced moderate stress. According to the conceptual framework, the perception of stress is subjective; what is stressful to one person may be more, or less, or not at all stressful to another (Lazarus & Folkman, 1984, 1-52, 117-178; Lazarus, 1966; 1987 cited by Lazarus, 1990: 3). Even though the subjects in this study experienced moderate stress, they found various strategies of coping to lower stress. There may be no universally good or bad coping processes, though some might more often be better or worse than others. Coping strategy that produces positive outcomes in one context, or in one person, may not in another (Lazarus, 1993: 238-239). Subjects then initiated a new set of coping strategies. There was a potential for good adaptation for the subjects who experienced mild stress. On the contrary, for the subjects who experienced severe stress and performed ineffective coping strategies needed more specific approach and intervention. The nurse, therefore, should be aware and has responsibility to assess maternal stress and work with mothers to find the appropriate coping strategies.

CHAPTER VI

CONCLUSIONS

Conclusions

This descriptive study aimed to describe maternal stress, relationships between maternal stress and maternal age, maternal education, family income, and perceived infant's illness severity, coping strategies and their perceived effectiveness of mothers of premature infants hospitalized in NICU. Transactional model of stress and coping by Lazarus and Folkman was used as a conceptual framework for the study. The purposive samples for this study were 60 Mothers of premature infants hospitalized in NICU recruited from Hatyai and Songklanagarind Hospital in Songkhla province. Data were collected in a six-month period from February to July 2005. The inclusion criteria used in selecting the sample were women who 1) gave birth at gestational age less than 37 weeks and an infant was hospitalized in NICU for 2-7 days with high technology for survival, 2) visited the infant in NICU at least once, 3) were able to speak and understand Thai language, 4) agreed to participate in this study, and, 5) no psychological distress after giving birth.

A total of 37 and 23 mothers of premature infants hospitalized in NICU from Hatyai and Songklanagarind hospital participated in the study. Their ages ranged from 16 to 43 years with the mean age of 28.88 years, with the majority (66.67%) being 25 to 40 years. Most of them were Buddhists (80.00%). Ninety three point three three percent of the subjects were married. The largest groups of the education level (48.33%) were high school. By Occupation, 40% of the subjects were agriculturists. The family income per month ranged widely from 3,000 to 50,000 baht (\bar{X} =13,593.33, S.D. =10,000.67, Median=10,000). Forty-eight point three percent of the families had an income higher than expenses. The majority of the subjects (63.3%) reimbursed their medical expenses from social insurance or health insurance. More than half of the subjects (56.67%) lived in the nuclear family. Forty-one point six seven percent of the subjects were primigravidarum and 45% experienced

hospitalization during pregnancy. Maternal perception for level of infant's illness severity varied from 0 to 10 ($\bar{X} = 5.88$, S.D. = 2.73), with nearly half of the subjects (46.67%) perceived moderate stress level of infant's illness severity. Most of day of infant's hospitalization at the time of data collection (38.33%) was two days.

The questionnaires used in this study were as follow: Maternal Demographic Characteristics Form, Perceived Infant's Illness Severity Scale, Infant Clinical Data Form, The Parental Stressor Scale (PSS: NICU), and The Thai Coping Scale. The above questionnaires were content evaluated by five experts; one neonatologist, one registered nurse with NICU experience for more than 20 years, and three nursing instructors; one experienced in caring for premature infants, one experiencing NICU study, and the other experiencing in pediatric nursing studies for more than 20 years. These instruments were tested with 15 mothers of premature infants hospitalized in NICU at Hatyai Hospital, but not the subject group. The reliability by Chronbach coefficient alpha of PSS: NICU was .96. When this tool was used with 60 subjects, the reliability was .93. The reliability by Kuder-Richardson of The Thai Coping Scale: occurrence of performed strategies was .89. When this tool was used with the sampling group, the reliability was .84. For The Thai Coping Scale: maternal perception for each performed strategies, the reliability by Chronbach alpha coefficients of the non-sampling and sampling group were 0.89 and 0.86 respectively. Data were analyzed with the SPSS/FW Program by using descriptive statistics, Pearson's correlation coefficients, and Spearman's rho correlation coefficients.

The results of this study were summarized as follows;

1. The means scores for both total maternal stress and for each subscale were at a moderate level ($\bar{X} = 2.86$, SD = 0.92, $\bar{X} = 2.55$, S.D. = 1.04, $\bar{X} = 3.02$, S.D. = 1.01, and $\bar{X} = 3.03$, S.D. = 1.03 respectively).

2. Maternal stress was significantly and positively correlated with perceived infant's illness severity ($r = .306$, $p < .01$). On the contrary, there were no significant relationships between maternal stress and maternal age, maternal education and family income ($p > .05$).

3. As a whole, all items of problem-focused coping strategies were performed and the mean scores of perceived effectiveness to lower stress were at a moderate level. The top two most frequently performed strategies were "being try to seek information about

infant's illness and treatment from nurses" (96.67%), and "being try to seek information about infant's illness and treatment from doctors" (91.67%). Their mean scores of perceived effectiveness to lower stress were the highest among all items ($\bar{X} = 3.59$, S.D. = 1.11 and $\bar{X} = 3.55$, S.D. = 1.31 respectively). Whereas, the two lowest mean scores that the subjects perceived effectiveness to lower stress were "being prepare yourself in case something serious happens to infant" and "being try to tell yourself that you do not know what will happen and you need time to evaluate this situation" ($\bar{X} = 2.61$, S.D. = 1.64 and $\bar{X} = 2.38$, S.D. = 1.46 respectively). Notably, although mean scores were the lowest, about a half of the subjects performed these strategies.

4. In a whole feature, mothers perceived that two-third of the emotional-focus coping strategies that they performed were effective to lower stress at a moderate level. The most frequently performed and mothers perceived to be the most effective to lower stress at a moderate to high level, was "being always have hope that your infant's illness will improve in the future" ($\bar{X} = 3.59$, S.D. = 1.08). Interestingly, among four of top five of the highest mean scores of perceived effectiveness, three of them were the items of religious/deity traditions. That is "being make merit through religious activities such as donating food, money, etc"; "being make a promise to spirits/deity/god if your infant's illness improves (or is cured)"; and "being prostrate to spirits/deity/god" ($\bar{X} = 3.45$, S.D. = 1.86, $\bar{X} = 3.42$, S.D. = 1.94, and $\bar{X} = 3.41$, S.D. = 1.89 respectively).

Remarkably, strategies performed by the large number of the subjects did not indicate their effectiveness according to the subject's perception. For example, "being feel tense" and "being feel anxious" were the top two most frequently performed strategies among emotional-focus coping strategies (80-83.33%) in a group of items that the subjects perceived their effectiveness to lower stress only at a low level ($\bar{X} = 2.17$, S.D. = 1.39 and $\bar{X} = 1.88$, S.D. = 1.28 respectively). Whilst, being bored/agitated/nervous was the strategies performed by the half of the subjects (50%), but its effectiveness was perceived at only a low level ($\bar{X} = 1.50$, S.D. = 0.97). In addition, items of negative response behaviors; "being get mad", "being angry with somebody else who you think caused your infant's illness", and "being curse or swear", were the three least frequently performed strategies (8.33%, 6.67%, and 1.67% respectively) and

their mean scores of perceived effectiveness to lower stress were only at a low level ($\bar{X} = 2.00$, S.D. = 0.64, $\bar{X} = 1.50$, S.D. = 0.44, and $\bar{X} = 1.00$, S.D. = 0.30 respectively).

Limitations

Because of the cross-sectional design, the results demonstrated only the relations of studied variables at one particular point in time, and day to day changes of maternal stress cannot be discerned and did not allow for the investigation of coping over time.

Recommendations

The findings of this study provide several important implications for the nursing profession including nursing practice, nursing education, and nursing research.

Nursing practice

1. The result of this study indicated that a combination of coping strategies might be required for relief of maternal stress. Information on coping strategies and their effectiveness are useful for nurses to help mothers of premature infant hospitalized in NICU explore and find out their appropriate coping resources and strategies to achieve maternal adaptation.

2. Specific approach and intervention should be done if mother experiences high level of stress and/or she perceives that her own strategies are not effective enough to lower stress.

3. Effective coping strategies according to maternal perception would be very useful for mothers with high level of stress in order to be guidelines for nurses to persuade mother to try on performing those.

4. The result of the study which indicated that information from nurses and physicians are perceived to be the most effective problem-focus strategies to lower maternal stress. Nurses need to be aware of the stress that may be generated from inappropriate given information.

Nursing education

The results from this study indicated the need for emphasizing the importance of the phenomenon maternal stress during their premature infants' hospitalization in nursing

education. Specifically, maternal stress and related factors, as well as nursing interventions, should be acknowledged and addressed for the neonatal nurse specialist or registered nurses who provide care for post partum women and her infant.

Nursing research

Based on limitations and the findings of this present study, several recommendations for further research should be concentrated on the following:

1. Action research technique or experimental research design was recommended to study the effects of these stressors over time into the convalescing or chronic phases of the NICU experience.
2. Extended to populations in other cultural settings and more diverse socioeconomic groups.
3. The family as a unit of measurement should be concerned rather than mothers and fathers separately.
4. Longitudinal study was recommended to investigate how mothers cope with the premature birth of an infant.
5. The Thai Coping Scale was primarily utilized in this population. Although the questionnaire was adequately reliable, psychometric testing is necessary for the future study.

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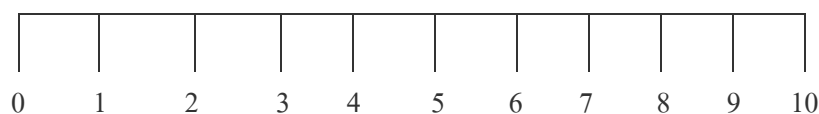
APPENDIX A INSTRUMENT

แบบบันทึกข้อมูลของแม่

วันที่ เดือน พ.ศ. โรงพยาบาล No

คำชี้แจง กรุณาเติมคำในช่องว่าง และทำเครื่องหมาย ✓ ลงใน ที่ตรงกับความเป็นจริงของท่าน

1. ท่านอายุ.....ปี
2. ท่านนับถือศาสนา พุทธ คริสต์
 อิสลาม อื่นๆ โปรดระบุ.....
3. สถานภาพสมรส โสด คู่ หม้าย/หย่า/แยกกันอยู่
4. ระดับการศึกษา ไม่ได้เรียนหนังสือ ประถมศึกษา ระบุ ปี
 มัธยมศึกษา ระบุ ปี อนุปริญญา ระบุปี ปริญญาตรี หรือสูงกว่า ระบุ.....ปี
5. อาชีพ แม่บ้าน รับจ้าง ระบุ
 ค้าขาย/ธุรกิจส่วนตัว ระบุ รับราชการ/รัฐวิสาหกิจ ระบุ
 เกษตรกรรม (ทำนา/ทำสวน/ทำไร่/เลี้ยงสัตว์) อื่นๆ ระบุ.....
6. รายได้เฉลี่ยของครอบครัวต่อเดือน บาท
 พอใช้เหลือเก็บ พอใช้ไม่เหลือเก็บ ไม่พอใช้
7. การจ่ายค่ารักษาพยาบาล
 จ่ายเองทั้งหมด เบิกได้ทั้งหมด ตั้งคมสงเคราะห์
 บัตรประกันสุขภาพ/บัตรประกันสังคม จ่ายเองและตั้งคมสงเคราะห์บางส่วน
8. ลักษณะของครอบครัว
 ครอบครัวเดี่ยว (อยู่ด้วยกันตามลำพัง พ่อ แม่ ลูก)
 ครอบครัวขยาย (มีญาติฝ่ายตนเอง/สามีอยู่ด้วย ได้แก่ ปู่ ย่า ตา ยาย ลุง ป้า น้า อา หลาน)
9. ท่านตั้งครรภ์ครั้งที่.....
10. ระหว่างตั้งครรภ์ท่านต้องเข้ารับการรักษาในโรงพยาบาล ไม่เคย เคย จำนวน ครั้ง
11. ท่านคิดว่าลูกของท่านเจ็บป่วยรุนแรงเพียงใด



ไม่รุนแรงเลย

รุนแรงมากที่สุด

แบบบันทึกข้อมูลทารก

คำชี้แจง กรุณาเติมคำในช่องว่าง และทำเครื่องหมาย ✓ ลงใน (สำหรับผู้วิจัย/ผู้ช่วยวิจัยกรอก)

1. เพศ ชาย หญิง
2. อายุครรภ์..... สัปดาห์
3. น้ำหนักแรกคลอด กรัม
4. อายุ.....วัน
5. ข้อวินิจฉัย (สามารถเลือกได้มากกว่า 1 ข้อ)
 - Extremely low birth weight (ELBW)
 - Very low birth weight (VLBW)
 - Low birth weight (LBW)
 - Perinatal asphyxia
 - Respiratory distress syndrome (RDS)
 - Meconium aspiration syndrome (MAS)
 - Persistent pulmonary hypertension of the new born (PPHN)
 - Transient tachypnea of the new born (TTNB)
 - Congenital anomaly
 - Others

แบบสอบถามความเครียดของแม่ที่ลูกเข้ารับการรักษาในหออภิบาลทารกแรกเกิด

ส่วนที่ 1

คำชี้แจง แบบสอบถามชุดนี้เป็นข้อความเกี่ยวกับเหตุการณ์ที่ทำให้ท่านเกิดความเครียด (ความวิตกกังวล ว้าวุ่นใจ หรือตึงเครียด) ในขณะที่ท่านเข้าเยี่ยมลูกของท่านในหออภิบาลทารกแรกเกิด กรุณาอ่านข้อความในแต่ละข้อ ว่าท่านเคยพบเหตุการณ์นั้นๆหรือไม่ หากท่านไม่เคยพบ โปรดทำเครื่องหมาย ลงในช่องไม่พบ หากท่านเคยพบ โปรดทำเครื่องหมาย ลงในช่องพบ และเหตุการณ์เหล่านั้นทำให้ท่านเกิดความเครียดมากน้อยเพียงใด กรุณาทำเครื่องหมาย ลงในตารางช่องที่ตรงกับระดับความเครียดของท่านมากที่สุด คำตอบที่ได้จะไม่มีการถูกหรือผิด เกณฑ์การเลือกตอบมีดังนี้

- ไม่เคยพบ หมายถึง ท่านไม่เคยพบเหตุการณ์นั้นๆ ในขณะที่ท่านเข้าเยี่ยมลูกในหออภิบาลทารกแรกเกิด
- ไม่เครียดเลย หมายถึง ท่านเคยพบเหตุการณ์และเหตุการณ์นั้น ไม่ทำให้ท่านเกิดความเครียดเลย
- เครียดเล็กน้อย หมายถึง ท่านเคยพบเหตุการณ์และเหตุการณ์นั้น ทำให้ท่านเกิดความเครียดเล็กน้อย
- เครียดปานกลาง หมายถึง ท่านเคยพบเหตุการณ์และเหตุการณ์นั้น ทำให้ท่านเกิดความเครียดปานกลาง
- เครียดมาก หมายถึง ท่านเคยพบเหตุการณ์และเหตุการณ์นั้น ทำให้ท่านเกิดความเครียดมาก
- เครียดมากที่สุด หมายถึง ท่านเคยพบเหตุการณ์และเหตุการณ์นั้น ทำให้ท่านเกิดความเครียดมากที่สุด

ตัวอย่าง

ข้อความ	ไม่พบ	พบ	เหตุการณ์นั้นๆทำให้ท่าน				
			ไม่เครียดเลย	เครียดเล็กน้อย	เครียดปานกลาง	เครียดมาก	เครียดมากที่สุด
1. แสงไฟสว่างจ้าในหออภิบาลทารกแรกเกิด	<input type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>

จากตัวอย่าง ถ้าท่านทำเครื่องหมาย ลงในช่อง พบ และ ช่องเครียดมากที่สุดแสดงว่าแสงไฟสว่างจ้าในหออภิบาลทารกแรกเกิดทำให้ท่านเกิดความเครียดมากที่สุด

ข้อความ	ไม่พบ	พบ	เหตุการณ์นั้นๆทำให้ท่าน				
			ไม่เครียดเลย	เครียดเล็กน้อย	เครียดปานกลาง	เครียดมาก	เครียดมากที่สุด
1. แสงไฟสว่างจ้าในหออภิบาลทารกแรกเกิด	<input type="checkbox"/>						

จากตัวอย่าง ถ้าท่านทำเครื่องหมาย ลงในช่อง ไม่พบ แสดงว่า ไม่มีการเปิดแสงไฟสว่างจ้าในหออภิบาลทารกแรกเกิดขณะที่ท่านเข้าเยี่ยมลูก

ข้อความ	ไม่พบ	พบ	เหตุการณ์นั้นๆทำให้ท่าน				
			ไม่เครียด เลย	เครียด เล็กน้อย	เครียด ปานกลาง	เครียด มาก	เครียด มากที่สุด
ภาพที่เห็นและเสียงที่ได้ยิน							
1. ท่านเห็นการทำงานของเครื่องมือและอุปกรณ์ทางการแพทย์ต่างๆ							
2. ท่านได้ยินเสียงการทำงานของเครื่องมือและอุปกรณ์ทางการแพทย์ต่างๆ ดังอยู่ตลอดเวลา							
3. ท่านได้ยินเสียงเตือนของเครื่องมือต่างๆ ดังขึ้นทันทีทันใด							
4. ท่านเห็นทารกป่วยรายอื่นๆ ในหออภิบาลทารกแรกเกิด							
5. ท่านเห็นเจ้าหน้าที่จำนวนมากมาทำงานในหออภิบาลทารกแรกเกิด							
6. ท่านเห็นลูกได้รับการรักษาด้วยเครื่องช่วยหายใจ							
ลักษณะและพฤติกรรมของลูก รวมทั้งการรักษาที่ลูกของท่านได้รับ							
7. ลูกมีท่อและสายต่างๆออกจากตัวหรืออยู่รอบๆตัว							
8. ลูกมีรอยถลอก รอยขีดหรือแผลผ่าตัด							
9. ลูกมีสีผิวผิดปกติ เช่น ซีดหรือเหลือง							
10. ลูกหายใจผิดปกติ เช่น เหนื่อยหอบ ปีกจมูกบาน ชี้ออกแรงบาน หน้าอกบวม							
11. ลูกตัวเล็ก							
12. ลูกมีผิวหนังเหี่ยวย่น							
13. ลูกถูกแทงเข็ม ใส่ท่อ หรือสายต่างๆ เข้าสู่ร่างกาย							
14. ลูกได้รับน้ำเกลือทางหลอดเลือด หรือได้รับนมทางสายให้อาหาร							
15. ลูกมีอาการเจ็บปวด							
16. ลูกดูเศร้า ไม่สดใส							
17. ลูกตัวอ่อนปวกเปียกหรือคู่อ่อนแอ							
18. ลูกเคลื่อนไหวแบบกระตุกหรือกระสับกระส่าย							
19. ลูกไม่สามารถร้องไห้เหมือนทารกคนอื่นๆ							

ข้อความ	ไม่พบ	พบ	เหตุการณ์นั้นๆทำให้ท่าน				
			ไม่เครียด เลย	เครียด เล็กน้อย	เครียด ปานกลาง	เครียด มาก	เครียด มากที่สุด
บทบาทแม่ในการดูแลลูกและความผูกพันกับลูก							
20. ท่านต้องแยกจากลูก							
21. ท่านไม่สามารถให้นมลูกได้เอง							
22. ท่านไม่สามารถดูแลลูกได้ เช่น เปลี่ยนผ้าอ้อมหรือเช็ดตัว							
23. ท่านไม่สามารถอุ้มลูกได้ตามต้องการ							
24. ท่านรู้สึกที่ไม่มีหนทางช่วยเหลือและไม่สามารถปกป้องลูกจากความเจ็บปวดหรือจากการรักษาที่ทำให้ลูกเจ็บปวดได้							
25. ท่านรู้สึกว่าจะช่วยเหลือลูกได้อย่างไรในช่วงเวลานี้							
26. ท่านไม่มีโอกาสได้อยู่ตามลำพังกับลูก							
27. ท่านไม่สามารถนำลูกไปพบสมาชิกคนอื่นๆในครอบครัวได้							
28. ท่านรู้สึกว่าเจ้าหน้าที่มีโอกาสสัมผัสใกล้ชิดลูกมากกว่าตัวท่านเอง							

ส่วนที่ 2

กรุณาระบุเหตุการณ์อื่นๆที่ทำให้ท่านเกิดความเครียด และระดับความเครียด ในขณะที่ท่านเข้าเยี่ยมลูกของท่านในหออภิบาลทารกแรกเกิด (สามารถระบุได้มากกว่า 1 เหตุการณ์)

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แบบสอบถามกลวิธีการเผชิญความเครียดของแม่ที่ลูกเข้ารับการรักษาในหออภิบาลทารกแรกเกิด

คำชี้แจง แบบสอบถามชุดนี้ เป็นข้อความเกี่ยวกับการปรับความรู้สึกรู้สึกนึกคิดหรือกิจกรรมของท่าน เมื่อท่านพบกับความเครียด ในขณะที่ลูกของท่านป่วยหนักและได้รับการรักษาในหออภิบาลทารกแรกเกิด กรุณาอ่านข้อความต่อไปนี แล้วพิจารณาว่าท่านได้ทำเช่นนั้นหรือไม่ หากท่านไม่ได้ทำเช่นนั้น โปรดทำเครื่องหมาย ลงในช่องไม่ทำ หากท่านทำเช่นนั้น โปรดทำเครื่องหมาย ลงในช่องทำ และสิ่งเหล่านั้นช่วยลดความเครียดของท่านมากน้อยเพียงใด กรุณาทำเครื่องหมาย ลงในช่องตาราง คำตอบที่ได้จะไม่มีการถูกหรือผิด เกณฑ์การเลือกตอบมีดังนี้

- ไม่ทำ หมายถึง ท่านไม่ได้ทำเช่นนั้น ในระหว่างที่ลูกของท่านเข้ารับการรักษาในหออภิบาลทารกแรกเกิด
- ทำ หมายถึง ท่านเคยทำเช่นนั้น ในระหว่างที่ลูกของท่านเข้ารับการรักษาในหออภิบาลทารกแรกเกิด
- ไม่ได้เลย หมายถึง สิ่งที่ท่านทำ ไม่ได้ช่วยลดความเครียดเลย
- เล็กน้อย หมายถึง สิ่งที่ท่านทำ ช่วยลดความเครียดได้เล็กน้อย
- ปานกลาง หมายถึง สิ่งที่ท่านทำ ช่วยลดความเครียดได้ปานกลาง
- มาก หมายถึง สิ่งที่ท่านทำ ช่วยลดความเครียดได้มาก
- มากที่สุด หมายถึง สิ่งที่ท่านทำ ช่วยลดความเครียดได้มากที่สุด

ตัวอย่าง

สิ่งที่ทำเมื่อพบกับความเครียด	ไม่ทำ	ทำ	ผลในการช่วยลดความเครียด				
			ไม่ได้เลย	เล็กน้อย	ปานกลาง	มาก	มากที่สุด
1. ท่านเล่าเรื่องที่ลูกเข้ารับการรักษาให้ญาติพี่น้องรับทราบ	<input type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>	

จากตัวอย่าง ถ้าท่านทำเครื่องหมาย ลงในช่องทำ และช่องมาก แสดงว่าท่านเล่าเรื่องที่ลูกเข้ารับการรักษาให้ญาติพี่น้องรับทราบ และสิ่งที่ท่านทำช่วยลดความเครียดได้มาก

สิ่งที่ทำเมื่อพบกับความเครียด	ไม่ทำ	ทำ	ผลในการช่วยลดความเครียด				
			ไม่ได้เลย	เล็กน้อย	ปานกลาง	มาก	มากที่สุด
1. ท่านเล่าเรื่องที่ลูกเข้ารับการรักษาให้ญาติพี่น้องรับทราบ	<input type="checkbox"/>						

จากตัวอย่าง ถ้าท่านทำเครื่องหมาย ลงในช่องไม่ได้ทำ แสดงว่า ท่านไม่ได้เล่าเรื่องที่ลูกเข้ารับการรักษาให้ญาติพี่น้องรับทราบ

สิ่งที่ทำเมื่อพบกับความเครียด	ไม่ทำ	ทำ	ผลในการช่วยลดความเครียด				
			ไม่ได้เลย	เล็กน้อย	ปานกลาง	มาก	มากที่สุด
1. ท่านมักจะตั้งความหวังเสมอว่าลูกจะมีอาการดีขึ้นในไม่ช้านี้							
2. ท่านรวบรวมสมาธิเพื่อควบคุมสถานการณ์นี้ให้ได้							
3. ท่านพยายามซักถามถึงอาการป่วยหนักของลูกจากแพทย์							
4. ท่านพยายามซักถามถึงอาการป่วยหนักของลูกจากพยาบาล							
5. ท่านพยายามซักถามถึงอาการป่วยหนักของลูกจากคนอื่นๆ เช่น เพื่อน และเพื่อนร่วมงาน							
6. ท่านร้องไห้							
7. ท่านใช้ยานอนหลับ							
8. ท่านเตรียมตัวสำหรับเหตุการณ์รุนแรงที่อาจเกิดขึ้นกับลูก							
9. ท่านไว้วางหรือฉุนเฉียว							
10. ท่านสวดหรือสาปแช่ง							
11. ท่านแก้ปัญหาโดยใช้ประสบการณ์เดิม							
12. ท่านปรับทุกข์กับแม่หรือญาติของทารกคนอื่น							
13. ท่านหาหมอดูเพื่อถามอาการเจ็บป่วยของลูก							
14. ท่านปฏิบัติกิจทางศาสนา เช่น สวดมนต์ ทำบุญ ตักบาตร บริจาคอาหาร/เงิน เป็นต้น							
15. ท่านกราบไหว้ หรือ อธิษฐานต่อสิ่งศักดิ์สิทธิ์ต่างๆ							
16. ท่านบนบานสิ่งศักดิ์สิทธิ์ที่ท่านนับถือเพื่อให้ลูกหายหรือมีอาการดีขึ้น							

สิ่งที่ทำเมื่อพบกับความเครียด	ไม่ทำ	ทำ	ผลในการช่วยลดความเครียด				
			ไม่ได้เลย	เล็กน้อย	ปานกลาง	มาก	มากที่สุด
17. ท่านปรับทุกข์เรื่องอาการป่วยหนักของลูกกับสมาชิกในครอบครัว							
18. ท่านปรับทุกข์เรื่องอาการป่วยหนักของลูกกับเพื่อนๆ							
19. ท่านค่อยๆแก้ปัญหาทีละเรื่องในแต่ละเวลา							
20. ท่านทำใจยอมรับความเจ็บป่วยของลูกตามความเป็นจริง							
21. ท่านได้เรียนรู้ประสบการณ์บางอย่างจากความเจ็บป่วยของลูก							
22. ท่านไม่คิดว่าความเจ็บป่วยของลูกเป็นภาวะวิกฤตของชีวิต							
23. ท่านพยายามไม่คิดถึงความเจ็บป่วยของลูก							
24. ท่านรู้สึกดีถึงเครียด							
25. ท่านนอนหลับ และหวังว่าเมื่อตื่นขึ้นทุกอย่างจะดีขึ้น							
26. ท่านพยายามจะไม่คิดถึงสถานการณ์ที่เครียดที่เกิดขึ้นมากเกินไป							
27. ท่านทำสิ่งอื่นเพื่อให้ลืมความเจ็บป่วยของลูก							
28. ท่านทำงานหนักขึ้น							
29. ท่านพยายามบอกตัวเองว่าท่านไม่ทราบว่าจะอะไรจะเกิดขึ้นและท่านต้องการเวลาที่จะตัดสินใจสถานการณ์นี้							
30. ท่านหลีกเลี่ยงที่จะเผชิญหน้ากับความเจ็บป่วยของลูก							
31. ท่านขอความช่วยเหลือจากบุคคลอื่นในสถานการณ์ความเครียดที่เกิดขึ้น							

สิ่งที่ทำเมื่อพบกับความเครียด	ไม่ทำ	ทำไม่ได้เลย	ผลในการช่วยลดความเครียด				
			เล็กน้อย	ปานกลาง	มาก	มากที่สุด	
32. ท่านรู้สึกเบื่อ/กระสับกระส่าย/กระวนกระวาย							
33. ท่านรู้สึกกังวลหรือเป็นทุกข์							
34. ท่านต้องการอยู่คนเดียว							
35. ท่านฝันถึงความสุข							
36. ท่านโกรธคนอื่นที่ท่านคิดว่าเป็นสาเหตุที่ทำให้ลูกเจ็บป่วย							
37. ท่านโกรธสิ่งอื่นที่ท่านคิดว่าเป็นสาเหตุที่ทำให้ลูกเจ็บป่วย							
38. ท่านระบายความเครียดกับบุคคลอื่นๆ							
39. กิจกรรมอื่นๆ ที่ท่านเลือกปฏิบัติเมื่อพบกับความเครียด และมีผลในการช่วยลดความเครียดได้อย่างไร (สามารถระบุได้มากกว่า 1 กิจกรรม)							

APPENDIX B

คำชี้แจงและพิกัดสิทธิ์ของผู้ป่วยในการเข้าร่วมวิจัย

สวัสดิ์ค๊ะ ดิฉัน นางอำไพพร ก่อตระกูล เป็นนักศึกษาพยาบาลปริญญาโท คณะแพทยศาสตร์ โรงพยาบาลรามาธิบดี ขณะนี้กำลังศึกษาวิจัยเรื่อง ความเครียด ปัจจัยที่เกี่ยวข้อง และรูปแบบการเผชิญความเครียดของมารดาทารกเกิดก่อนกำหนดที่เข้ารับการรักษาในหออภิบาลทารกแรกเกิด โดยมีวัตถุประสงค์เพื่อนำความรู้ที่ได้จากการศึกษาครั้งนี้ไปใช้เป็นแนวทางในการดูแลและให้ความช่วยเหลือในมารดาในกลุ่มนี้ต่อไป ถ้าคุณตกลงจะเข้าร่วมโครงการวิจัย ดิฉันจะอธิบายเกี่ยวกับการศึกษาครั้งนี้ ดังนี้

คุณจะได้รับการสัมภาษณ์หรือการตอบแบบสอบถามเกี่ยวกับ ข้อมูลส่วนบุคคล แบบสอบถามความเครียด และแบบสอบถามกลวิธีการเผชิญความเครียดในระหว่างที่ลูกของคุณเข้ารับการรักษาในหออภิบาลทารกแรกเกิด โดยคุณจะใช้เวลาในการตอบแบบสอบถามหรือได้รับการสัมภาษณ์ครั้งละประมาณ 20-25 นาที ณ หออภิบาลทารกแรกเกิด เมื่อลูกของคุณเข้ารับการรักษามาแล้วอย่างน้อย 2 วัน ซึ่งในระหว่างนี้ ถ้าคุณมีข้อสงสัยประการใดเกี่ยวกับการวิจัยครั้งนี้ ดิฉันยินดีอธิบายให้คุณเข้าใจ โดยข้อมูลที่ได้ทั้งหมดจากแบบสอบถาม ดิฉันจะเก็บเป็นความลับ และการนำเสนอผลการวิจัยจะนำเสนอในภาพรวม คุณจะไม่ได้รับความเสี่ยงในการเข้าร่วมโครงการวิจัย และสามารถเลือกว่าจะเข้าร่วมในโครงการวิจัยครั้งนี้หรือไม่ก็ได้ หรือในระหว่างที่คุณเข้าร่วมโครงการ คุณมีสิทธิ์ที่จะยกเลิกได้ตลอดเวลาที่คุณต้องการ โดยไม่มีผลต่อการรักษาหรือบริการที่คุณและลูกของคุณได้รับ

ขอบคุณค่ะ

อำไพพร ก่อตระกูล

APPENDIX C

Table 8. Frequencies, Percents, means, standard deviations, and level of maternal stress scores

Maternal Stress	n	%	X	S.D.	Level
Sights and Sounds					
The presence of monitors and equipment	59	98.33	2.54	1.19	Mod
The constant noises of monitors and equipment	47	78.33	2.62	1.50	Mod
The sudden noises of monitor alarms	37	61.67	2.92	1.78	Mod
The other sick babies in the room	60	100.0	2.45	1.17	Mod
The large number of people working in the unit	59	98.33	2.03	1.32	Mild
Having a machine (respirator) breathe for my baby	38	63.33	3.50	2.00	Mod
Infant Behavior and Appearance					
Tubes and equipment on or near my baby	55	91.67	3.05	1.50	Mod
Bruises, cuts or incisions on my baby	36	60.00	3.11	1.83	Mod
The unusual color of my baby (for example looking pale or yellow jaundiced)	34	56.67	3.38	1.90	Mod
My baby's unusual or abnormal breathing patterns	35	58.33	3.46	1.89	Mod
The small size of my baby	59	98.33	3.25	1.30	Mod
The wrinkled appearance of my baby	34	56.67	2.74	1.64	Mod
Seeing needles and tubes put in my baby	53	88.33	3.34	1.58	Mod
My baby being fed by an intravenous line or tube	59	98.33	2.75	1.42	Mod
When my baby seemed to be in pain	32	53.33	3.53	1.95	Mod
When my baby looked sad	28	46.67	3.68	1.96	Severe
The limp and weak appearance of my baby	30	50.00	3.40	1.93	Mod
Jerky or restless movements of my baby	35	58.33	3.03	1.81	Mod
My baby not being able to cry like other babies	21	35.00	3.48	1.81	Mod

Table 3. Frequencies, Percents, means, standard deviations, and level of maternal stress scores (cont'd)

Maternal Stress	n	%	X	S.D.	Level
Maternal Role Alterations					
Being separated from my baby	58	96.67	3.47	1.35	Mod
Not feeding my baby myself	50	83.33	3.28	1.70	Mod
Not being able to care for my baby myself (for example, diapering, bathing)	54	90.00	2.85	1.53	Mod
Not being able to hold my baby when I want	53	88.33	3.25	1.51	Mod
Feeling helpless and unable to protect my baby from pain and painful procedures	43	71.67	3.63	1.84	Mod
Feeling helpless about how to help my baby during this time	50	83.33	3.56	1.67	Mod
Not having time to be alone with my baby	54	90.00	2.56	1.80	Mod
Not being able to share my baby with other family members	55	91.67	2.69	1.50	Mod
Feeling staff is closer to my baby than I am	58	96.67	1.97	1.26	Mild

APPENDIX D
LIST OF EXPERTS CONSULED ON VALIDATION OF
THE INSTRUMENT

The content validity of questionnaires were determined by five consulting experts included

1. Associate Professor Fongcum Tiloksakulchai
Department of Pediatric Nursing, Faculty of Nursing,
Siriraj Hospital, Mahidol University.
2. Assistant Professor Jariya Wittaya-sooporn
Department of Nursing, Faculty of Medicine,
Ramathibodi Hospital, Mahidol University.
3. Assistant Professor Kruawan Tinsulanon
Department of Nursing, Faculty of Medicine,
Ramathibodi Hospital, Mahidol University.
4. Assistant Professor Waricha Janjindamai
Department of Pediatric, Faculty of Medicine,
Songklanagarind Hospital, Prince of Songkla University.
5. Mrs. Pairat Kasikarn
NICU Head Nurse, Songkla Hospital.

BIOGRAPHY

NAME	Mrs. Ampaiporn Kautrakool
DATE OF BIRTH	26 October 1964
PLACE OF BIRTH	Songkhla, Thailand
INSTITUTIONS ATTENDED	Prince of Songkla University, 1982-1985 Bachelor of Science (Nursing and Midwifery) Mahidol University, 2000-2005 Master of Nursing (Pediatric Nursing)
GRADOATE STUDY FUNDED	University Development Committee (UDC)
POSITION & OFFICE	1986-1996, Songklanagarind Hospital Faculty of Medicine, Prince of Songkla University, Position: Nurse 6 1996-Present, Department of Pediatric Nursing, Faculty of Nursing, Prince of Songkla University, Position: Instructor 7 Tel. 074-286564