



AN EMPIRICAL TEST OF A CAUSAL MODEL OF ADOLESCENT MOTHER-GRANDMOTHER ATTACHMENT

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2020



นุชรีย์ แสงสว่าง

คุณุฎีนิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปรัชญาคุฎีบัณฑิต

สาขาวิชา Nursing Science (Inter)

คณะพยาบาลศาสตร์ มหาวิทยาลัยบูรพา

2563

ลิขสิทธิ์เป็นของมหาวิทยาลัยบูรพา

AN EMPIRICAL TEST OF A CAUSAL MODEL OF ADOLESCENT MOTHER-
GRANDMOTHER ATTACHMENT



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A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR DOCTOR OF PHILOSOPHY
IN NURSING SCIENCE
FACULTY OF NURSING
BURAPHA UNIVERSITY

2020

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KEYWORDS: ADOLESCENT MOTHER, ATTACHMENT, GRANDMOTHER

NUCHAREE SANGSAWANG : AN EMPIRICAL TEST OF A CAUSAL MODEL OF ADOLESCENT MOTHER-GRANDMOTHER ATTACHMENT. ADVISORY COMMITTEE: NUJJAREE CHAIMONGKOL, Ph.D., WANNEE DEOISRES, Ph.D. 2020.

Postpartum depression (PPD) among adolescent mothers is a major public health problem worldwide which can affect both adolescent mothers and their infants. A randomized controlled trial was conducted to examine the effectiveness of the Nurse–Led Social Support Program (NLSS program) on PPD in adolescent mothers. The NLSS program was developed based on social support theory and literature review. Forty-two adolescent mothers who met the inclusion criteria were randomly assigned into either experimental group ($n = 21$) or control group ($n = 21$). Participants in the experimental group received the NLSS program plus usual care, whereas the control group received only usual care. PPD was measured by the Thai version of the Edinburgh Postnatal Depression Scale (EPDS). The EPDS score ≥ 13 was considered to have PPD. The PPD was measured at pretest, posttest (4 weeks), and followed-up (6 weeks and 12 weeks) of postpartum. Descriptive statistics and Repeated Measures ANOVA were used to analyze data.

The findings found that only 20 participants remained in each group at the last follow-up. The results revealed that mean scores of EPDS in the experimental group were statistically significant lower at 4 weeks, 6 weeks, and 12 weeks after participating in the NLSS program ($p < .05$, $p < .01$, and $p < .01$, respectively). Furthermore, mean scores of EPDS in the experimental group were statistically significant lower than those in the control group at 4 weeks, 6 weeks, and 12 weeks ($p < 0.01$, $p < 0.01$, and $p < 0.01$, respectively). Moreover, the rates of adolescent mothers who experienced PPD symptoms in the experimental group were lower than those in the control group at 4 weeks, 6 weeks, and 12 weeks. These findings indicated that the NLSS program was effective to prevent PPD in adolescent mothers. Therefore, midwiferies or nurses should implement the NLSS program to adolescent mothers to prevent postpartum depression.

ACKNOWLEDGEMENTS

I would like to express my gratitude to my major advisor, Assoc. Prof.

Dr. Nujjaree Chaimongkol for her unlimited support, encouragement, advising, shaping in my academic process, and my life. She also spent her time for encouragement throughout my study. She is my great and strong advisor. I would also express my gratitude to my co-advisor, Assoc. Prof. Dr. Wannee Deoisres, for her kindness, support, guidance, knowledge, teaching, and suggestion, as well as Assist. Prof. Dr. Pornpat Hengudomsub and Asst. Prof. Dr. Yunee Pongjaturawit, dissertation examination committee for their guidance and valuable suggestion. I am also grateful for Prof. Dr. Rutja Phuphabul, the chair committee of my dissertation defense, for her thoughtful and valuable feedback.

I would especially like to recognize Assoc. Prof. Dr. Pairatana Wongnam for his dedication and suggestion about statistical analysis. I would like to thank all of nursing faculty members in the Ph.D. program for their academic knowledge, suggestion, and kindness, and all the working staff at Faculty of Nursing Burapha University for their assistances.

Special gratitude and appreciation to the Graduate School, Burapha University for supporting scholarship in conducting my dissertation. I also would like to express my grateful to Chachoengsao, Chon Buri, and Rayong provincial public health office for permission to collect data, and staff of all health promoting hospitals for helping with the data collection.

I would also like to give special thanks to all participants, adolescent mothers and their mothers who participated in my study.

A great gratitude and special thanks to Asst. Prof. Tassaneeya Wangsachantanon, a former Dean of the Faculty of Nursing, Srinakharinwirot University for permitting me to study in the doctoral program in nursing science, and providing the scholarship.

Great appreciation was recognized to all experts, Asst. Prof. Dr. Yunee Pongjaturawit, Asst. Prof. Dr. Siriluk Utsaha, and Asst. Prof. Krich Rajprasit for their translation of the research instruments.

Finally, I would also like to thank my family. Especially, Ms. Bussara

Sangsawang who is my heart, my soul, and my lovely older sister twin, my mothers, my sisters, and my boyfriend for their love and encouragement always. Unforgettable, I offer special thanks to all of my doctoral classmates # 10 for their friendship, helping, supportiveness, and togetherness.

Nucharee Sangsawang



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CHAPTER 1

INTRODUCTION

Statements and significance of the problems

Adolescent mothers are characterized by young age, lack of resources, low income and education with a tendency to continue and live with parents to receive and share child rearing (Devito, 2010; Mphatswe, Maise, & Sebitloane, 2016). In particular, adolescents who have their own babies early are more likely to perceive this situation and transition roles to motherhood as a critical period fraught with difficulty and feelings of their distress that usually require seeking proximity and feelings of security with responses of attachment figures from their mothers (called grandmothers) who are often the attachment figure. Therefore, adolescent mother-grandmother attachment is an important source of support for boosting adolescent mothers' feelings of security and comfort when faced with distress (David, Van Dyk, & Ashipala, 2017; Ngum Chi Watts, Liamputtong, & Mcmichael, 2015; Simpson & Rholes, 2012).

Generally, grandmothers play a crucial role in providing support, care and shelter with instrumental and emotional support for adolescent mothers and their children. Because early motherhood has significantly affected on adolescent mothers, their family and spouse (Herrman & Nandakumar, 2012). Adolescent mothers are not ready to become a mother and their motherhood and maternal role becomes cumbersome and problematic for them (Aparicio, Pecukonis, & O'Neale, 2015; Leese, 2016; Riva Crugnola, Ierardi, Gazzotti, & Albizzati, 2014). Thus, grandmothers serve as models for good maternal roles and promote maternal competence for adolescent mothers (Clemmens, 2003; Devito, 2010; Oberlander, Black, & Starr, 2007 ; Sgarbpssa & Ford-Giiboe, 2004). The findings are similar in Thailand where grandmothers usually play the role of primary caregivers of adolescent mothers as they transition from the status of mother to grandmother early, and have younger ages as first-time grandmothers (Phoodaangau, Deoisres, & Chunlestskul, 2013 ; Yodthong, Seeherunwong, Kongsuriyanavin, & Pornchaikate, 2014).

Currently, adolescent mothers represent a significant public health concern. Globally, the World Health Organization (WHO, 2018a) estimates that approximately

21 million girls aged between 15-19 years and 2 million girls aged under 15 years will become pregnant and give birth. Most of these births will occur in developing countries. In Thailand, evidence shows that the number of adolescent mothers has had rising trends since 1992-2015. In 2015, the birth rates among female adolescents aged 10-14 years were 1.5 per 1000 females, and there were 44.3 per 1,000 female adolescents aged 15-19 years in 2015 (Thailand. Bureau of Reproductive Health, 2015). Consequently, most Thai adolescent mothers (60-67.7 %) stay with their mothers and original families in order to receive familial support (Kamphaengphan, Kaewpornawan, & Apinuntavech, 2011; Narong, 2013; Phoodaangau et al., 2013 ; Tumhiran & Dechakrup, 2010). Consistent with Thai cultural context, several supports are provided from mothers of adolescent mothers who are primary caregiver of adolescent mothers that is expected. Based on Thai cultural context and gender determinant, several supports are provided from mother of adolescent mothers. (Phoodaangau et al., 2013 ; Wichaiya, 2012; Yodthong et al., 2014).

Adult attachment theory (1987) is extended from the attachment theory (Ainsworth, 1989; Bowlby, 1969) and is elaborated on adult relationships in terms of the expectations, perceptions and nature of adult intimate relationships. They proposed that adult attachment is an emotional tie with an irreplaceable other who provides a secure base that is regulated by the same stages and motivational system as infants (Hazan & Shaver, 1987; Hazan & Zeifman, 1999). Attachment behavioral systems in adulthood are aimed at regulating distress and providing a secure base for continued psychological growth with increasing maturity and autonomy. When a person is distressed or threatened, the attachment figure is used as a source of safety, protection and comfort. These threatening or triggering situations of individuals include both physical and psychological threats that should activate the attachment system to provide a secure base for individuals (Mikulincer & Shaver, 2007). Therefore, the attachment systems of these adolescent mothers are activated when they are in critical period in order to provide physical or psychological security and develop infant-mother attachment patterns.

Attachment relationships with parents provide important functions long after infancy, extending into adolescence and adulthood (Raudino, Fergusson, & Horwood, 2013). As above mentioned, attachment between adolescent mothers and grandmothers

may be viewed as adult attachment. It is an important relationship in the life span, because it has a stronger and greater intimacy than any other relationship (Rossi, 1993; Troll & Fingerman, 1996). Adolescent mothers still require responses from the attachment figure to regulate feelings of distress or threats, regain an emotional sense of security and provide a secure base (Bowlby, 1969; J. Bowlby, 1980; Mikulincer & Shaver, 2007; Simpson & Rholes, 1994). For adolescents, however, their attachment behavior is in a reconstructed pattern since they become less dependent on parental relationships or caring from a primary attachment figure as they become separated from their parents and more focused on relationships with peers (Dubois-Comtois, Cyr, Pascuzzo, Lessard, & Poulin, 2013).

Importantly, attachment security with parents, particularly mother, in adolescence and adulthood is associated with interpersonal and psychological outcomes, such as relatedness in other relationships (Allen, Porter, McFarland, McElhaney, & Marsh, 2007; Fraley, Heffernan, Vicary, & Brumbaugh, 2011). As above mentioned, the attachment of adolescent mothers and grandmothers may not be limited to the direct effects on adolescent mothers, but may have more indirect influence over relationships with children and partners (Bartholomew & Horowitz, 1991; Cook & Roggman, 2010). Additionally, the quality of attachment can be positive and secure or negative and insecure for adolescents who are securely attached to their mothers. Individual personality and capability tend to have competency in solving life's problems and managing distress (Mikulincer & Shaver, 2007). Moreover, positive attachment received from grandmothers can encourage positive parenting behavior in adolescent mothers (Barnett et al., 2012; Cook & Roggman, 2010). Adolescent mothers who have internal security and remember a sense of responses from their own mothers during childhood are more likely to respond and be more sensitive with their infants (Kretchmar & Jacobvitz, 2002). Other studies have indicated that people who have secure attachments with their parents tend to have longer relationships with partners, be less likely to experience divorce and feel comfortable with both intimacy and autonomy (Bartholomew & Horowitz, 1991; Feeney & Noller, 1990; Hazan & Shaver, 1987).

Insecure or negative attachments of adolescent mothers can adversely affect parenting self-efficacy, lead to less parenting satisfaction, create difficult problems in

their new roles and responsibilities, result in less intimacy with others and cause negative impact on parenting behavior (Calvo & Bianco, 2015; Oberlander et al., 2007 ; Vieira, Avila, & Matos, 2012). Similarly, in individuals with insecure attachment, the evidence indicates a preoccupation with seeking emotional closeness to others or fear of intimate relationships with others (Bartholomew, 1990; Hazan & Shaver, 1987; Zvelc, 2010).

Based on the attachment theory and literature review, it is suggested that the quality of attachment between adolescent mothers and grandmothers is related to several factors such as family functioning, grandmother childcare involvement, adolescent parenting stress, social support and partner relationship (Barnett, Mortensen & Gonzalez, 2016; Cook & Roggman, 2010; Kullik & Petermann, 2013; Lubiewska & Derbis, 2016; Miller & Commons, 2010; Ruhl, Dolan, & Buhrmester, (2008) Shahyad, Besharat, Asadi, ShirAlipour & Miri, 2011). Therefore, in-depth examination of these factors would enhance understanding of the causal relationship between adolescent mother and grandmother attachment.

Generally, the family functions to determine the roles and responsibilities of members, support one other, especially during critical events, form relationships and give reciprocal trust (Jahangir, 2012). Family members have an influence over the successes of one another as a result of internal family function (Hamed, Samavi, & Askari, 2014).

Family functioning is defined as a basic family actions aimed at providing appropriate conditions for family members to develop physical, psychological, social and other aspects (Dai & Wang, 2015; Miller, Ryan, Keitner, Bishop, & Epstein2000). Better family functioning has been found to be associated with secure attachments among members within the family (Rawatlal, Kliwer, & Pillay, 2015). Moreover, most dimensions of family functioning are associated with attachment. For example, high levels of family cohesion and better communication patterns tend to have greater levels of secure attachment than insecure attachment (Kapanee & Rao, 2007). Family adaptability and cohesion influence positive attachment relationships (Liu et al., 2008). On the other hand, less cohesion, support and communication lead to less secure attachments (Kullik & Petermann, 2013 ; Miller & Commons, 2010).

Grandmothers who live with their adolescent mothers participate in the care of their grandchildren as well as supporting and giving guidance to their daughter (Barnett, Scaramella, Nepl, Ontai, & Conger, 2010). Thus, grandmothers' involvement in childcare could be a significant issue among adolescent mothers. It is an important source of emotional, financial, instrumental and informational support that can buffer adolescent mothers from negative psychological consequences (Gordon, Chase-Lansdale, & Brooks-Gunn, 2004). It also has an impact on attachment and parenting outcomes. Previous study showed that adolescent mothers who received more involvement from their mothers had high levels of attachment with their mothers (Barnett, Mortensen, & Gonzalez, 2016; Cook & Roggman, 2010).

Parenting stress refers to specific difficulties in adjusting to the parenting role which involves parental emotional and behavioral responses to some unpleasant events that affect well-being (Abidin, 1995; Crnic & Low, 2002; Lubiewska & Derbis, 2016; Seginer, Vermulst, & Gerris, 2002). Parenting stress is also associated with attachment in which perceived stress can inhibit secure attachment and activate attachment insecurity (Feldman, 2007; Lubiewska & Derbis, 2016; Nakagawa, Teti, & Lamb, 1992; Riggs & Han, 2009). Mothers with high levels of parenting stress are more likely to have attachment insecurity (Green, Furrer, & McAllister, 2011).

During the adolescent period, the primary attachment figure can transfer from parent to peer or partner (Dinero, Conger, Shaver, Widaman, & Larsen-Rife, 2008). Findings have also indicated that subsequent romantic relationships with partners may affect attachment representations (Dinero et al., 2008; Mikulincer & Shaver, 2007). Adolescents or young adults who receive greater romantic involvement from their partners are associated with stronger attachment to partners and lower attachment to mothers and friends (Feeney, 2004).

Social support is viewed as an important source for adolescent mothers and is defined as various forms of assistance with a direct role in promoting recovery from stress and crisis experiences in addition to serving as a buffer against the effects of stress, including guidance, emotional support and tangible support. Social support is categorized into several dimensions such as informational, emotional, instrumental, appraisal and tangible support (House, 1981; Logsdon & Koniak-Griffin, 2005). Social support influences attachment by increasing feelings of security, life

satisfaction, capacity to seek and awareness about receiving help from attachment figures with encouragement of reciprocity (Green et al., 2011 ; Moller, Fouladi, McCarthy, & Hatch, 2003; Shahyad, Besharat, Asadi, ShirAlipour, & Miri, 2011). Adolescent mothers who receive more social support tend to have less likelihood of attachment insecurity (Green et al., 2011). Moreover, partners are also identified as a common source of support for adolescent mothers (Gee & Rhodes, 2007; Oldehinkel, Verhulst, & Ormel, 2011).

Family functioning, partner relationship and social support are also intercorrelated. Family functioning such as communication associated with social support by increasing skills for seeking support from social networks (Yurdakul, 2018). Thus, it could be improved attachment within family. In contrast, lack of communication skill with family members may reduce their perceived and actual social support from others (Nilsen, Karevold, Roysamb, Gustavson, & Mathiesen, 2013). Previous studies indicated that social support is intercorrelated with partner relationship. Support from social networks especially grandmother buffered the negative effects in the adolescents' relationship. Perceptions of less social support from their mothers predicted relationship within family (Gee & Rhodes, 2003). Moreover, lower levels of support reduce relationship satisfaction and increase instability with partner (Overall, Fletcher, & Simpson, 2010).

Research on attachment beyond infancy is important for enhancing developmental outcomes for adolescence and adulthood. To date, a considerable number of studies conducted in Western countries have mentioned the factors influencing attachment. These studies have been more focused on mother and child relationships rather than the relationships between adolescent mothers and grandmothers. Both Western and Eastern countries, especially in Thailand have limited evidence about adolescent mother-grandmother attachments. Therefore, it is essential that an integrative research approach to identify the predictors of attachment between adolescent mothers and grandmothers be applied out early as possible to increase the benefits of attachment outcomes. The expected findings of this study may help determine significant predictors of this attachment and will contribute to the knowledge about the development of specific nursing interventions that can enhance positive outcomes.

Objective

To test a causal model of adolescent mother-grandmother attachment.

Research hypotheses

1. Family functioning has a direct positive effect on adolescent mother-grandmother attachment, and has indirect effects on adolescent mother-grandmother attachment through social support and partner relationship.
2. Grandmother childcare involvement has a direct positive effect on adolescent mother-grandmother attachment.
3. Social support has a direct positive effect on adolescent mother-grandmother attachment, and has an indirect effect on adolescent mother-grandmother attachment through partner relationship.
4. Adolescent parenting stress has a direct negative effect on adolescent mother-grandmother attachment.
5. Partner relationship has a direct positive effect on adolescent mother-grandmother attachment.
6. Family functioning, adolescent parenting stress, grandmother childcare involvement, social support, and partner relationship influence adolescent mother-grandmother attachment.

Conceptual framework

Adult attachment theory (Hazan & Shaver, (1987) is derived and later expanded from the attachment theory of Ainsworth (Ainsworth, 1989; Bowlby, 1969) in order to explain attachment of adult and used to guide the conceptual framework of this study. Attachment between adolescent mothers and grandmothers is viewed or identified attributes as a bond, intimacy, and emotional tie between a mother and daughter that lasts over the life span and is posited as an adult attachment. Therefore, the adult attachment is an emotional tie with an irreplaceable other who provides a secure base that is regulated by the same stages and motivational system as infants (Hazan & Shaver, 1987; Hazan & Zeifman, 1999). Importantly, the antecedent of adult attachment was proposed when adults are distressed from threatening events,

they may seek an attachment figure to provide a source of safety, protection and comfort in order to regain feelings of security. Therefore, their attachment system is activated and indicates that adults require responsiveness from attachment figures in order to regulate feelings of distress and regain a sense of security (Hazan & Shaver, 1987; Shaver & Hazan, 1988).

The attachment figures of adults have greater variety of relationships than infants, including siblings, other relatives, family co-workers, teachers, close friends and romantic partners (Mikulincer & Shaver, 2007). In particular, although the attachment figures of adolescent mothers may include parents, romantic partners and peers, the most important attachment figures can be assumed to be the mothers of adolescent mothers (called grandmothers). Similar to adults, adolescent mothers continue to require responses from their attachment figures as grandmothers regulate feelings of distress or threat, regain an emotional sense of security and provide a secure base (Mikulincer & Shaver, 2007; Simpson & Rholes, 1994). Because adolescent mothers who married and give birth early are more likely to perceived this situation and their transition roles to motherhood as a critical period of difficulty and feelings of distress (Ngum Chi Watts et al., 2015). Moreover, the quality of attachment can be positive or negative outcomes with adolescent mother, child and partner of adolescent mothers.

According to the literature review related to adult attachment, the factors influencing attachment included family functioning, grandmother childcare involvement, adolescent parenting stress, social support and partner relationship. First, parenting stress could be a predictor as an antecedent of attachment and explain negative effect on the attachment between adolescent mothers and their mothers. In addition, family functioning, grandmother childcare involvement, social support, and partner relationship also are a predictor as an activating for higher attachment that could be indicated a positive effect on this attachment. Finally, family functioning influenced social support, and social support also predict partner relationship. Therefore, the hypothesized model of this attachment is proposed and illustrated in Figure 1.

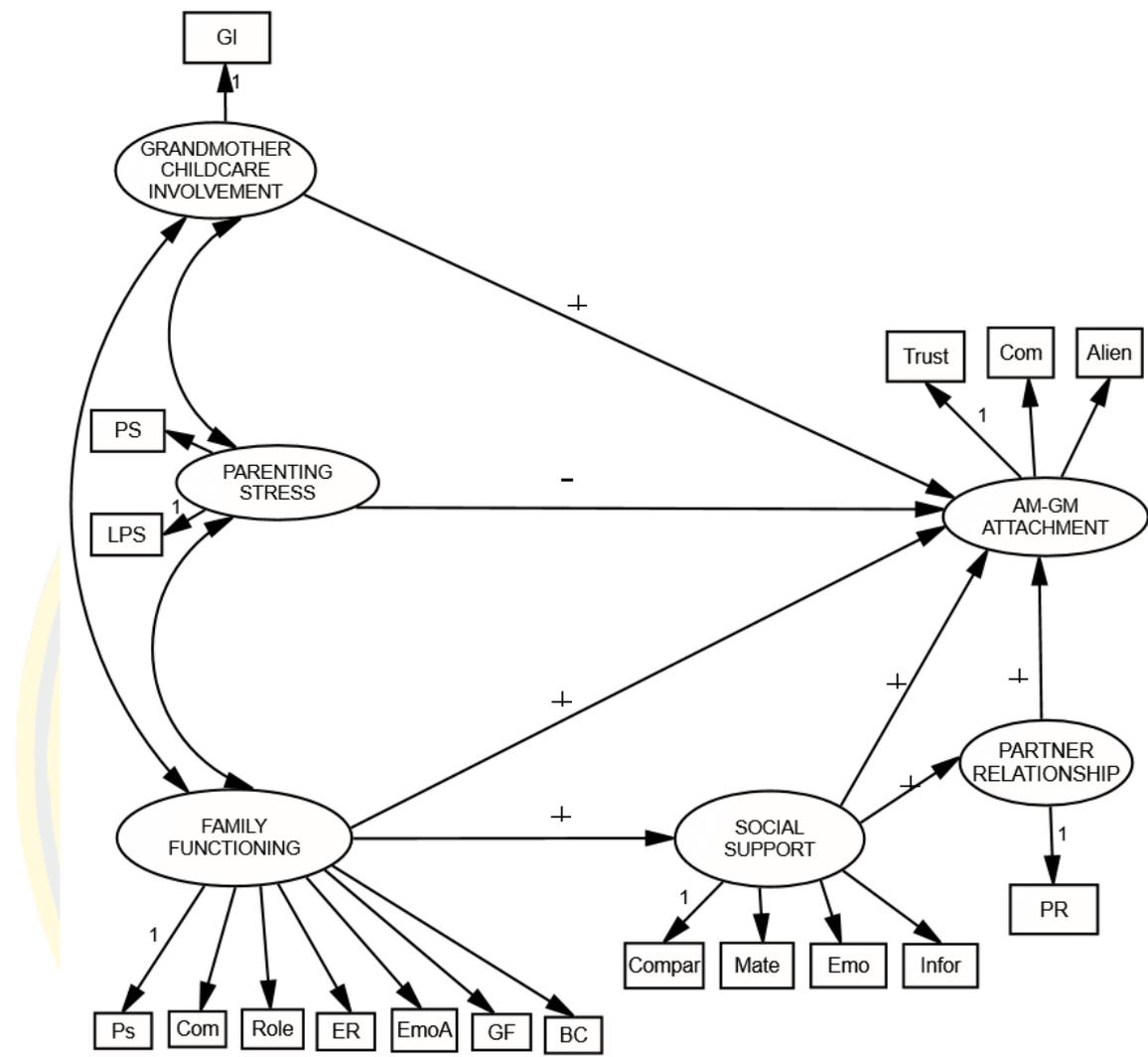


Figure 1 The hypothesized model of adolescent mother-grandmother attachment

Scope of the study

A model-testing design was used to examine the influence of five predictors of adolescent mother-grandmother attachment. The participants in this study was 240 adolescent mothers in Tambon Health Promoting Hospitals [THPHs] of the eastern region of Thailand from January-July 2019.

Definition of terms

Adolescent mother-grandmother attachment refers to an affectionate bond, mutuality and reciprocal behavior between adolescent mothers and their mothers (grandmothers) represented by love, closeness, caring, warmth and feelings of security. It was measured by using the Inventory of parent and peer attachment (IPPA-Thai version) (Armsden & Greenberg, 1987).

Family functioning refers to adolescent mother's perception of the activities and responsibilities of family members participating in maintaining the well-being of their families. It includes problem-solving, communication, family roles, affective response, affective involvement and behavior control. It was measured by using the Chulalongkorn family inventory [CFI] (Trangkasombat, 2006).

Grandmother childcare involvement refers to adolescent mother's perception of caring, support, activities, responsibility and participation from their mothers (grandmothers) to help them with child rearing. It was measured by using the maternal grandmother involvement scale -Thai version (Barenett et al, 2010).

Social support refers to an adolescent mother's perception on receiving assistance from their mothers, spouse, peer, and relative person to provide child rearing, transition to maternal role, and increasing maternal competence including material, emotional, informational, and appraisal support. It was measured by using the Postpartum support questionnaire [PSQ-Thai version] (Wongvisetsirikul, 1997).

Adolescent parenting stress refers to the affection and cognitive response of adolescent mother as perceived from their difficult events in childrearing and effects on adjusting to the maternal role and well-being. It was measured by using the parental stress scale (PSS-Thai version) (Berry & Jones, 1995).

Partner relationship refers to love, harmony, intimacy, satisfaction, trust, and understanding between adolescent mothers and their children's biological fathers. It was measured by using the relationship quality scale [RQ scale Thai version] (Chonody, Gabb, Killian, & Dunk-West, 2018).

CHAPTER 2

LITERATURE REVIEWS

This study aimed to test a causal model of adolescent mother-grandmother attachment. Related literature was reviewed and organized into the following four parts:

1. Adult attachment theory and adolescent mothers-grandmothers attachment
2. Adolescent mothers and grandmothers: Situations and their relationships
3. Measures of adult attachment
4. Factors related to adult attachment in term of adolescent mother and their mother (grandmother)

Adult attachment theory and adolescent mothers-grandmothers attachment

The adult attachment theory (Bartholomew & Horowitz, 1991; Hazan & Shaver, 1987, 1990) was subsequently expanded from attachment theory (J. Bowlby, 1979) to explain adult relationships and was elaborated the parallels between the child-caregiver relationship and the relationship between adult. The concept of attachment theory (J. Bowlby, 1979) emphasizes the importance of emotional regulation, psychological well-being and mental health of relational bonds with attachment figures, who are defined as people who are sensitive, available and supportive in times of need. Later on, attachment in the early lives of infants is transferred to different relationship throughout the life span in adulthood for the fundamental survival system (Ainsworth, 1979; Bowlby, 1969; J. Bowlby, 1973; Dinero et al., 2008; Khodarahimi, Hashim, & Mohd-Zaharim, 2016).

Principles of the adult attachment theory

According to Bowlby (1969), the attachment system is instinctive, activated by any conditions and motivates infants to seek proximity to supportive others (attachment figures) as a means of protecting them from physical and psychological threats and promoting affect regulation, well-being and increasing self-efficacy

(Bowlby, 1969; 1982b). The system was designed to promote survival, functions to reduce fear, anxiety and is related to various forms of distress (Bowlby, 1969). This system is activated by primary conditions such as fear, isolation from other people, separation from an attachment figure and physical conditions such as extreme hunger and fatigue that threaten a sense of security (Bowlby, 1969; 1973). In other words, when security perceived to be insufficiently attained, the attachment system remains partially or fully activated. If security is felt to be continually denied by attachment figures, the attachment system can remain in a chronic activation that means individuals cannot fully attend to other important life tasks (J. Bowlby, 1973). This system is terminated when individuals experience a sufficient reduction in fear, anxiety or distress in a process known as the attainment of “felt security” (J. Bowlby, 1973; Sroufe & Waters, 1977).

According to the adult attachment (Bartholomew & Horowitz, 1991; Hazan & Shaver, 1987, 1990), the attachment system is strong in infants and young children during the early years of life, it assumed to be active over the entire life span and underlies the formation and maintenance of relationship bonds in adulthood. Attachment figures are not just close family/friends and important relationship partners. They are special individuals to whom a person turns when protection and support are needed (Mikulincer & Shaver, 2007). The function of attachment figures should serve in three provisions. First, attachment figures are a target for proximity seeking. All people tend to seek and benefit from proximity to their attachment figures in times of need. Second, they provide a “safe haven” as a source of support and comfort or protection and alleviation of distress. Third, they serve as a “secure base” from which people can explore and learn about the world as they develop capacities and personal traits. Based on these functions, a close relationship partner becomes a source of attachment security and attachment bond.

Mikulincer and Shaver (2003) and Shaver and Mikulincer (2002) describe the model of attachment system in adulthood that comprise of three issues including proximity seeking following attachment-system activation, beneficial consequences of using this strategy effectively to attain the support of a security-providing attachment figure, and secondary strategies in order to pursue in response to attachment figure unavailability or unresponsiveness. The model includes the goals of the primary and

secondary attachment strategies that associated with beliefs and expectations about self and others, and associated with the rules for managing distress and interpersonal relations. In particular, the model explains what happens when secondary strategies fail to accomplish the goals. The first component of the model includes monitoring and appraisal of threatening event that is the process responsible for activating the attachment system. The second component is the monitoring and appraising attachment figure availability which is related to individual differences in felt security and the psychological correlates and consequences of secure attachment. The third component is monitoring and appraising the viability of proximity seeking as a way of dealing with attachment insecurity. The model is sensitive to both context and personal dispositions. All the components of the model can be affected by the context such as dangers or threats, availability or unavailability about attachment figure, and the viability of seeking proximity to and protection from an attachment figure in a particular situation. For instance, reminding a person of supportive behavior on the part of a past or present attachment figure can cause even a chronically insecure person to feel momentarily more secure and to behave accordingly. The model illustrated in Figure 2.

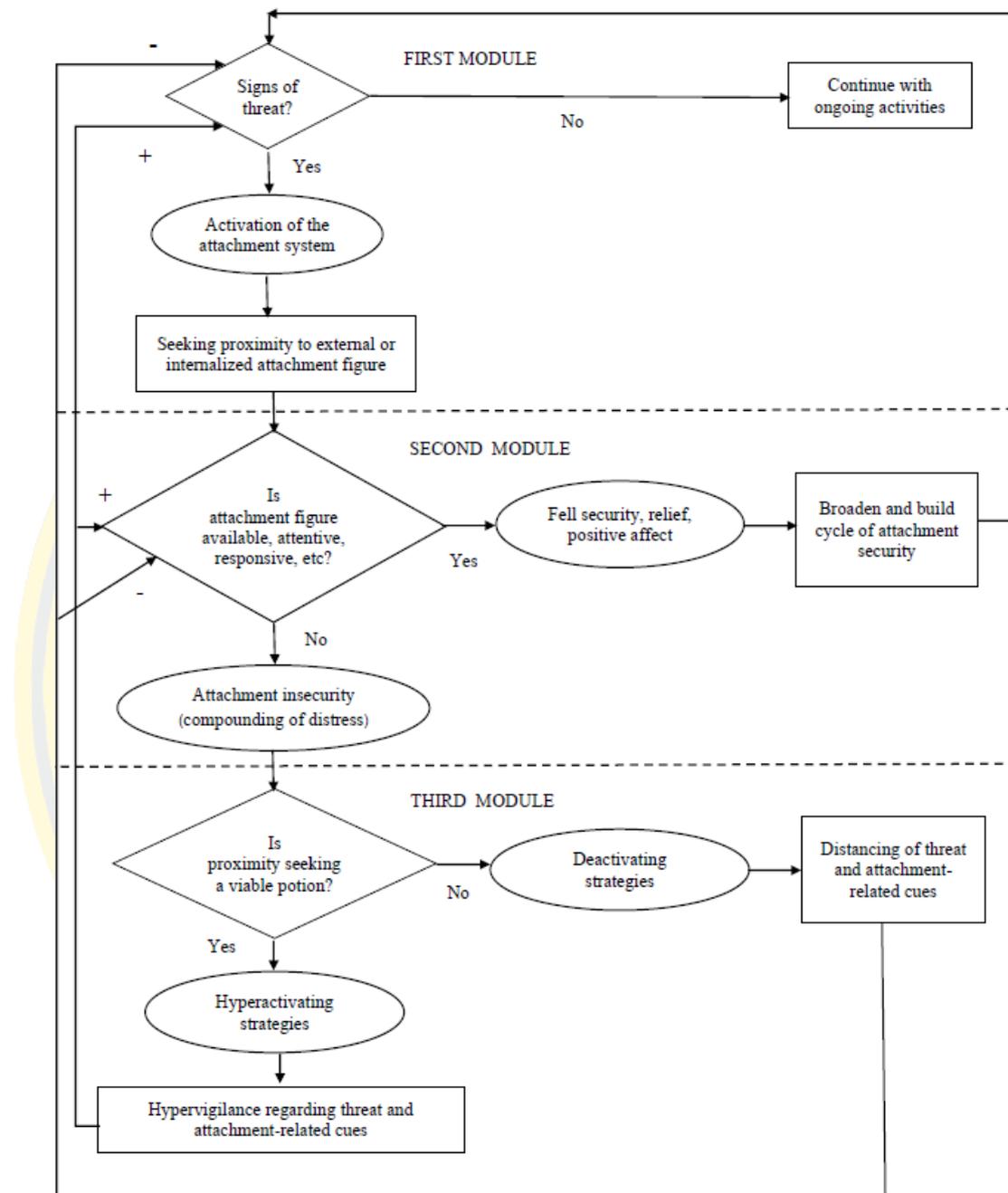


Figure 2 A model of attachment-system activation and functioning in adulthood (Mikulincer & Shaver, 2003; Shaver & Mikulincer, 2002)

Attachment in adults

Adult attachment theory derived from original attachment theory (Bowlby, 1969; 1973, 1980). Hazan and Shaver (1987) expanded the Bowlby's attachment theory

(Bowlby, 1969; 1973, 1980) to adult attachment theory to explain the development of affectionate bonds in infancy in order to understand adult attachment which can explain the expectations, perceptions and nature of adult intimate relationships (Loubser, 2007). Adult attachment relationships represent an emotional tie with an irreplaceable other who provides a secure base (Doherty & Feeney, 2004). These relationships are governed by the same stages and motivational systems that were regulated in infants as described by Bowlby and Ainsworth (Hazan & Shaver, 1987; Hazan & Zeifman, 1999). Attachment systems in adulthood aim to regulate distress and provide a secure base for continued psychological growth and increasing maturity and autonomy (Shaver, Hazan, & Bradshaw, 1988). When an individual feels distressed or threatened, the attachment figure is used as a source of safety, protection and comfort (Hazan & Shaver, 1987; Shaver & Hazan, 1988). These threatened or triggering situations of individuals include both physical and psychological threats that can activate the attachment system (Mikulincer & Shaver, 2007).

Internal working models

The attachment theory (Bowlby, 1969, 1973) explained that people develop a mental representations (or internal working models) that comprise expectations about the self, significant others, and the relationship between the people. Working models also are suggested to involve processes that influence what information individuals attend to, how they interpret events in their world, and what they remember (Bowlby, 1980; Bretherton, 1985, 1990; Main, Kaplan, & Cassidy, 1985). For instance, adults who have secure attachments with their parents tend to have longer relationships, are less likely to experience divorce, feel comfortable with both intimacy and autonomy, have secure attachment in their romantic relationships and have positive perceptions of early family relationships (Bartholomew & Horowitz, 1991; Diehl, Elnick, Bourbeau, & Labouvie-Vief, 1998; Feeney & Noller, 1990; Hazan & Shaver, 1987; Levy, Blatt, & Shaver, 1998). According to Bowlby (1969; 1973, 1980) and Hazan and Shaver (1987), the way in which individuals are treated by significant others across the lifespan such as parents, close friends and romantic partners continues to guide and shape close relationships, expectations, attitudes and beliefs when people build new relationships with future partners.

Attachment styles in adulthood

Attachment theory originally focused on the bonds formed between infants and their caregivers (J. Bowlby, 1973). Subsequent studies have highlighted the parallels between these parent-child relationships and subsequent relationships between romantic partners beginning in young adulthood (Hazan & Shaver, 1987). More recently, attachment theory has been extended beyond early lifespan development and intimate relationships such as parental or romantic relationships to include more general relationships with people such as friends or colleagues (Cassidy & Shaver, 2008; Konrath, Chopik, Hsing, & O'Brien, 2014). The examination of individual differences in attachment system functioning in adults focuses on attachment styles that were patterns of expectations, needs, emotions and social behavior. The attachment styles result from a particular history of attachment experiences and usually begin in relationships with parents (Fraley & Shaver, 2000).

The attachment style of a person reflects their most chronically accessible working models and the typical functioning of their attachment system in a specific relationship or across relationships. Each attachment style is closely tied to working models and reflects the underlying and organizing actions of a particular attachment strategy (Mikulincer & Shaver, 2007). The kinds of individual differences observed in infant-caregiver relationships are similar to the observations in romantic relationships (Fraley & Shaver, 2000). However, differences in adult attachment are conceptualized in terms of four distinct styles as secure, dismissing, preoccupied, and fearful attachment and based on two-dimensional models of Dimension 1 (model of self and how people regard themselves) and Dimension 2 (models of others around them) (Bartholomew & Horowitz, 1991; Cassidy, 2000; Feeney, 2008; Pietromonaco & Barrett).

Attachment style was first proposed by Ainsworth (1967) to describe infants' patterns of response when they are separated from and reunited with their mothers in a laboratory in a Strange Situations assessment procedure. It was originally classified into one of three categories called secure, anxious-ambivalent and anxious-avoidant. A secure infant seems to process accessible working models of successful proximity-seeking attempts and security attainment, while avoidant infants seem to process accessible working models related to attachment-system deactivation

and anxious infants seem to process accessible working models related to attachment-system hyperactivation.

However, the attachment process in adult relationships are likely have more complex social networks than close familial relationships held by infants and young children (Konrath et al., 2014). Hazan and Shaver (1987) adopted Ainsworth's three-category approach and applied the ideas of Bowlby as a framework for studying and organizing individual differences in the way adults think, feel and behave in romantic relationships. They described three types of attachment styles, namely, secure, avoidant and anxious-ambivalent.

Later, Bartholomew (1990), and Bartholomew and Horowitz (1991) classified adult attachment into four styles, namely, secure, dismissing, preoccupied and fearful. Secure attachment is characterized by people who are comfortable with intimacy and autonomy. Dismissing attachment is characterized by people who are self-reliant and value autonomy to an extreme degree, often at the expense of intimacy with others. Preoccupied attachment is characterized by people who typically have low self-worth and are anxious in close relationships. Lastly, fearful attachment is characterized by people who desire intimacy but have a general distrust for others and avoid involvement in relationships potentially leading to rejection.

In subsequent years, several studies have demonstrated that attachment styles in adults are best captured by the anxiety and avoidant dimensions (Fraley, Waller, & Brennan, 2000). People with high attachment-related avoidance are uncomfortable with closeness and depending on relationship partners; they have a preference to maintain emotionally distant and self-reliant with the use of deactivating strategies to deal with insecurity and distress. While people with attachment-related anxiety strongly desire excessive closeness and protection, they worry about their partners' unavailability to respond or harbor a fear of abandonment with feelings that they are unworthy of love and the use of hyperactivating strategies to deal with insecurity and distress.

Attachment between adolescent daughters and mothers

Adolescents and adults may have a wide range of attachment figures that differs from the attachment figures of infants and toddlers in early childhood who probably also have a limited number of available attachment figures. The attachment

figures of adolescents have greater variety of relationship partners than those of infants, which include siblings, other relatives, family members, co-workers, teachers, close friends and romantic partners, etc. (Mikulincer & Shaver, 2007), even though adolescents are less dependent on their parents and more fully developed (Allen & Land, 1999). In fact, mothers are the main caregivers who spend more time with their children than fathers in terms of child rearing. Thus, mothers are often assumed to be likely to transfer values and prepare their children to become functioning members of society (Akgün, 2008; Craig, 2006; Johnson, 2000; Shannon & Shaw, 2008). Moreover, the involvement of mothers is believed to be the most important role models for their daughters (Starrels, 1994). Therefore, daughters experience feelings of nurturing, tenderness and security with their mothers (Dauglass, 2005).

Therefore, attachment between mothers and daughters is believed to have a stronger and greater intimacy than other parent-child relationships and dyad's bond is the most affectionate in a family relationship (Martell, 1990; Troll & Fingerman, 1996). The relationship between mother and daughter is a source of strength and considered important for a girl's development throughout her entire life (Notman, 2006; Tyson, 1991) because adolescents' attachment styles to mothers or any caregivers are related to the quality of future relationships (J. Bowlby, 1988). If they have experience with conflicts between differentiation, developing self and maintaining the attachment with their mothers, the result is likely to be an ambivalent relationship between mothers and daughters.

When an adolescent gave birth and became a mother, her mother, then, became grandmother. The attachment between adolescent mothers and grandmothers may be viewed as a closeness, intimacy, strength and support across their life spans (Rossi, 1993; Rossi & Rossi, 1990). However, the pattern of this attachment relationship can change from several periods of transition, including daughter crossings over to becoming adolescent daughters, daughter transitioning to marriage and motherhood and mothers transferring over to elder adulthood and infirmity (Yoo, 2004). Similar to infants and adults, adolescent mothers seek close physical and emotional proximity to attachment figures when they are distressed and still require responses from their significant others to regulate feelings of distress or threats, regain an emotional sense of security

and provide a secure base (Bowlby, 1969; 1973, 1980; Mikulincer & Shaver, 2007; Simpson & Rholes, 1994).

Although adolescents' attachment behavior is reconstructed in terms of patterns as adolescents grow in maturity, become less dependent on parental relationships, are increasingly separate from their parents and become more focused on relationships with peers (Colin, 1996; Dubois-Comtois et al., 2013). Mothers of adolescent mothers (called grandmothers) remain an important source for adolescent mothers, because most adolescent mothers are more likely to be single, have their own babies early and report a lack of support with low educational attainments and socio-economic disadvantages (Cook & Cameron, 2015; Gyesaw & Ankomah, 2013). For the above reasons, adolescent mothers are more likely to perceive their disadvantages during a critical period marked by difficulty, feelings of distress and an option to continue living with their mothers to receive support from them (David et al., 2017; Mphatswe et al., 2016 ; Ngum Chi Watts et al., 2015; Tumhiran & Dechakup, 2010). According to the attachment theory, grandmothers are the attachment figures of adolescent mothers who provide sensitivities and responsibilities as a "safe haven" and "secure base" when adolescent mothers need protection, support and alleviation of distress (Gyesaw & Ankomah, 2013; Mikulincer & Shaver, 2007; Phoodaangau et al., 2013).

Adolescent mothers and grandmothers: Situations and their relationships

Adolescence is a transitional period for young people between the ages of 10 and 19 years that is viewed as a key point in the lifespan (WHO, 2018b). For the onset of this transitional period, it is most important for adolescents to be activated and fully developed into adulthood. In addition, this period needs to meet the demands and achieve the tasks of adolescents such as less dependence on caregiving from parents as they become young adults (Allen & Land, 1999; Erikson, 1968; Neinstein, 1996). Key tasks of adolescents include developing autonomy with increasingly less dependence on their parents (Allen & Land, 1999). In addition, adolescents can transfer their attached figures from parent to peer or partner with

greater focus on peer relationships (Dinero et al., 2008; Dubois-Comtois et al., 2013). However, the adolescent period is considered a critical time in a young person's life with the initiation of sexual activities and having a romantic partner. Therefore, the early onset of sexual activities and several factors increase the risk for unplanned pregnancy and early motherhood (Ngum Chi Watts et al., 2015).

When an adolescent becomes pregnant, it is usually unexpected, unplanned and a shock for the adolescent and her family (David et al., 2017). The psychological adjustment of pregnancy leads to challenges in the transition of adolescence (Littleton & Engebretson, 2005). Next, the transition to motherhood begins with pregnancy, a phase of profound physical, biological and neuro-endocrinological changes that have been associated with increases in fear, anxiety and difficulty facing problems among adolescent mothers (Melender, 2002). Adolescent mothers have many social and psychological problems as they are faced with the dual challenge of processing through the stages of adolescence and adapting to the maternal role (Devito, 2010) such as transitioning to a new role and new responsibilities as a mother, or having a more difficult experience than adult mothers during the early-parenting period (Anglely, Divney, Magriples, & Kershaw, 2011; Devito, 2007).

Currently, adolescent mothers remain a public health concern in many developing and developed countries. Worldwide, approximately 21 million teens aged between 15-19 years and 2 million girls aged under 15 years will become pregnant and give birth every year, and most of these births to adolescent mothers occur in developing countries (Gyesaw & Ankomah, 2013; WHO, 2018a). In addition, adolescent birth rates range from 1 to 201 births per 1000 adolescents aged 15-19 years based on rates in different countries (World Bank, 2015). In developed and high-income countries, the highest rate of adolescent birth rate among adolescents aged 15-19 years was reported at 47 births per 1,000 female adolescents aged 15-19 years in England and Wales, 23 births per 1,000 female adolescents in New Zealand, 21 births per 1,000 female adolescents in the United States, and 8 births per 1,000 female adolescents in Switzerland (Sedgh, Finer, Bankole, Eilers, & Singh, 2015; World Bank, 2015).

In developing countries, especially in Southeast Asian countries, high birth rates of adolescent mothers have been found in many countries. In 2015, the highest

birth rate of adolescents was reported in Lao PDR at 64 births per 1,000 female adolescents aged 15-19 years, with a rate of 63 births per 1,000 female adolescents in the Philippines and 52 births per 1,000 adolescent females in Cambodia (World Bank, 2015). However, the lowest birth rate of adolescents in Malaysia was 14 births per 1,000 female adolescents aged 15-19 years old, followed by Myanmar was 16 births per 1,000 female adolescents (World Bank, 2015). In Thailand, evidence shows that adolescent mothers have had rising trends since 1992-2015. In particular, in 2015, the birth rate among adolescents aged 10-19 years was 15.3 births per 1,000 adolescent females, which accounted for 679,502 births and 44.3 per 1,000 females aged 15-19 years (Bureau of Reproductive Health, 2015). Moreover, in 2016, the birth rates among adolescents aged 10-14 years were 1.4 per 1000 females, and 42.5 per 1,000 females among adolescents aged 15-19 years (Bureau of Reproductive Health, 2016). Similar to the World Bank, the birth rate in Thailand was reported at 45 births per 1,000 females aged 15-19 years (World Bank, 2015).

Compared with adult mothers, not only do adolescent mothers have several problems, but their infants are also at increased risk for negative outcomes such as low birth weights, prenatal death, increased risk for premature birth and development problems (Black, Fleming, & Rome, 2012; Kaewjanta, 2012; Morinis, Carson, & Quigley, 2013 ; Thaithae & Thato, 2011). The children of adolescent mothers have heightened risk for developmental delays, deficits in social and cognitive development, insufficient nutrition and development care, behavioral problems and greater likelihood for abandonment than children of adult mothers. Moreover, there are increased risks for emotional and behavioral problems such as physical assault, poor quality of life, growth and development delays (particularly cognitive) with speech and language delays (Kearney & Levine, 2012; Mollborn & Dennis, 2012; Morinis et al., 2013 ; Oxford & Spieker, 2006; Ruedingera & Cox, 2012 ; Tantives et al., 2013).

In the past, pregnant adolescents often married and independently lived with their husbands. However, current trends show that the majority of adolescent mothers are continuing to live with their parents with shared care of their newborns with their own mothers. Most adolescent mothers stay with their mothers and original families in order to receive support from their mothers and families (Borcherding, SmithBattle, & Schneider, 2005; Kamphaengphan et al., 2011; Mphatswe et al., 2016 ; Narong,

2013; Tumhiran & Dechakhup, 2010). Because most of these adolescents remain younger, they face a lack of support, perceived difficulty, problems with transition to their new maternal role and socio-economic disadvantages (Cook & Cameron, 2015; Gyesaw & Ankomah, 2013). Living with their mothers (grandmothers) tends to decrease their problems and promote their economic and educational status (Cook & Cameron, 2015; Kalil & Danziger, 2000; Sadler & Clemmens, 2004; Stiles, Barkham, Mellor-Clark, & Connell, 2008). Therefore, mothers of adolescent mothers are the primary caregivers for adolescent mothers (Gyesaw & Ankomah, 2013; Phoodaangau et al., 2013).

As a mother transitions into the role of grandmother when her daughter gives birth to her first child, the relationship between mother and daughter as a regular role crosses over into an adolescent mother and grandmother relationship (Maposa & SmithBattle, 2008). Mothers of adolescent mothers (called grandmothers) are identified as a consistent and dependable source of emotional and tangible support for adolescent mothers (Devito, 2007) and take on the new responsibility of childcare in addition to caring for other family members (Johnson-Garner & Meyers, 2003). Because most adolescent mothers remain single, are younger, lack support, face difficulty and problems as they transition to the new maternal role and low socio-economic status (Cook & Cameron, 2015; Gyesaw & Ankomah, 2013), mothers of adolescent mothers generally play a crucial role in providing support and care as they offer shelter in addition to instrumental and emotional support for adolescent mothers and grandchildren. They also serve as a role model for good transition to the maternal role and promote maternal competence for their adolescent daughters (Devito, 2010; Oberlander et al., 2007 ; Sgarbpssa & Ford-Giiboe, 2004). In Thailand, grandmothers usually play the role of primary caregiver of adolescent mothers and raise grandchildren as they take on new roles to support their adolescent daughters (called adolescent mothers); this is an expectation based on the Thai cultural context and determined by the gender (Phoodaangau et al., 2013 ; Wichaiya, 2012; Yodthong et al., 2014). However, some grandmothers find themselves in conflict with their new roles in caring for daughters and her grandchildren with potential feelings of anger, guilt and a feeling of being

“too young” to be a grandmother (Devito, 2010; Mulder, 2009; Paskiewicz, 2001 ; Sadler & Clemmens, 2004). For example, even though some grandmothers are unhappy or disappointed about their daughters’ pregnancies, they still provide support for their adolescent mothers (Ngum Chi Watts et al., 2015). Furthermore, in developing countries such as Thailand, grandmothers have early changes in their status change from mother to grandmother, and have younger ages as first-time to grandmothers (Yodthong et al., 2014). Interestingly, most adolescent mothers’ families providing support for adolescent mothers are found to have low family income, insecure professions and low socioeconomic status (Kamphaengphan et al., 2011; Tumhiran & Dechakhup, 2010).

Adolescent mothers who live with their original families mean three generations are living together. This allows the grandmother to provide support and care of the adolescent mother and her child (Devito, 2010; Gyesaw & Ankomah, 2013). In particular, grandmothers who live with adolescent mothers and have good relationships are also role models for good maternal roles and promoting maternal competence among adolescent mothers (Clemmens, 2003; Sgarbpsa & Ford-Giiboe, 2004). The support that adolescent mothers receive from their mothers depends on their relationship between the period before pregnancy and birth of the newborn. A good relationship between parents and adolescent mothers is a good indicator that the adolescents are likely to receive support. Moreover, adolescent mothers who live with at least one biological parent or relatives receive the most help and support as compared to those who do not live with their parents or relatives (Ngum Chi Watts et al., 2015).

Measures of adult attachment

Assessing the adolescent mother-grandmother attachment is the most important source of healthcare providers to encourage their attachment and increase the benefits of the attachment. Several instruments were developed to measure the attachment. Most of these are self-report questionnaires (Crowell, Fraley, & Shaver, 2008).

The Inventory of parent and peer attachment [IPPA]

The IPPA was developed by Armsden and Greenberg (1987) in order to assess adolescents' perceptions of the positive and negative affective/cognitive dimension of relationships with their parents and close friends. Particularly, the instrument was developed to assess how well these figures serve as sources of psychological security. The original attachment theory by Bowlby (1969) and recently expanded by others was used as the theoretical framework for this instrument. Three broad dimensions of IPPA are assessed: degree of mutual trust; quality of communication; and extent of anger and alienation. IPPA was originally developed from a sample of adolescents aged 16 to 20 years. However, it has been used successfully in several studies with adolescents who were as young as 12 years of age (Armsden & Greenberg, 1987). The instrument is a self-report questionnaire with a 5 point-Likert scale with responses from 1 (almost never or never true) to 5 (almost always or always true). The original version consisted of 28 parent and 25 peer items, thereby yielding two attachment scores. The IPPA revised version is composed of three 25-item forms for the separate assessment of attachment to mothers, fathers and peers. It was scored by reverse-scoring of the negatively worded items and then summing the response values in each section. This measure showed high test-retest reliability and acceptable validity in most studies (Armsden & Greenberg, 1987; Armsden, McCauley, Greenberg, Burke, & Mitchell, 1990; Papini, Roggmann, & Anderson, 1991).

The relationship questionnaire [RQ]

The RQ was developed by Bartholomew and Horowitz (1991). It is one of the most widely used self-reports to measure adult attachment styles. The RQ consists of four short paragraphs or items that describe the four prototypical adult attachment styles, including secure, dismissing, preoccupied and fearful (Bartholomew, 1990; Bartholomew & Horowitz, 1991). To complete the questionnaires, the respondents rated or chose the extent to which each paragraph best described their attachment style (Bartholomew & Horowitz, 1991; Feeney, 1999; Pietromonaco & Barrett, 1997). The scale is correlated highly with other self-report measures and interview-based assessments of attachment style (Bartholomew & Horowitz, 1991; Bartholomew & Shaver, 1998; Brennan, Clark, & Shaver, 1998). The RQ is reliable, well-validated,

widely used, culture-sensitive and carries considerable self-observer agreement among peers, romantic partners and family members (Bartholomew & Horowitz, 1991; Griffin & Bartholomew, 1994; Scharfe & Bartholomew, 1994; Schmitt et al., 2004). RQ responses are relatively stable across time periods ranging from 8 months to 2 years post-assessment and strongly used for examining potential changes in adult attachment styles over time (Scharfe & Bartholomew, 1994; Zhang & Labouvie-Vief, 2004).

The experiences in close relationship-revised [ECR-R]

The ECR-R was developed by Fraley and Shaver (2000). It was used to assess participants' attachment styles in romantic relationships. This is a widely used self-report measure of romantic attachment. The original version contained 36 questions related to feelings of emotional security and intimacy in relationships. The scale measures two major dimensions of attachment in the context of close romantic relationships including anxiety (18 items) and avoidance (18 items). The ECR-R statements are rated on 7-point Likert scales ranging from 1 (strongly disagree) to 7 (strongly agree). The total scoring range was from 36 to 252 points with higher scores indicating a low level of attachment security and low scores indicating the use of an attachment figure as a safe haven when facing distress and danger (Fraley & Shaver, 2000). However, in order to decrease easily adverse effects on reliability during implementation with clinical samples, especially psychiatric patients, a shorter version with 18 items (ECR-R-18) was developed by Wei, Russell, Mallinckrodt, and Vogel (2007). Later on, it was translated into Thai by Wongpakaran and Wongpakaran (2012). The Cronbach's alpha coefficient of this ECR-R-18 Thai version was .84.

The revised adult attachment scale [RAAS]

The RAAS was first developed based on attachment theory by Collins and Read (1990) and revised by Collins (1996). It was used to assess the three attachment dimensions (closeness, dependence and anxiety) and the four adult attachment styles identified by Bartholomew and Horowitz (1991) (secure, dismissing, preoccupied and fearful). RAAS consists of 18 items with self-reporting that asks participants to rate the extent to which each statement describes their feelings and behaviors in relation to romantic relationships in general. The responses were rated on a 5-point Likert scale ranging from 1 (not at all characteristic of me) to 5 (very characteristic of me).

This scale has three subscales: dependence, closeness and anxiety. Following by, the “closeness” dimension refers to the extent to which a person is comfortable with closeness and intimacy. The “dependence” dimension refers to the extent to which a person feels he/she can depend on others to be available when needed. The “anxiety” dimension refers to the extent to which a person is worried about being rejected or unloved. Finally, the subjects were divided into three groups based on the results: Secure, anxious and avoidant attachment styles. Items 1, 6, 8, 12, 13, and 17 measured secure attachment, while Items 2, 5, 7, 14, 16, and 18 measured avoidant attachment and Items 3, 4, 9, 10, 11, and 15 measured anxious-ambivalent attachment. The internal consistency reliability values for the subscale of the closeness, dependence and anxiety scale were .72, .76, and .87, respectively (Adamczyk & Bookwala, 2013).

The adult attachment questionnaire [AAQ]

The adult attachment questionnaire [AAQ] was developed by Simpson, Rholes, and Phillips (1996) to assess two dimensions of attachment: attachment avoidance and attachment anxiety. A dimensional approach was used rather than a categorical approach to scoring in order to maximize the sensitivity of the measures of changes in adult attachment styles (Fraley & Waller, 1998). The AAQ’s rating was a seven-point scale ranging from 1 (strongly disagree) to 7 (strongly agree). An eight-item avoidant subscale in Items 1-3 and 5-9 was used to assess respondents’ comfort with close relationships, while the nine items of the anxious subscale in Items 4 and 10-17 measured anxiety about having close relationships; five negatively worded responses were averaged to create an anxiety score. Higher scores indicated either more avoidance or more anxiety toward social relationships. The Cronbach’s alpha coefficient of this AAQ was .79 (Crowell, Fraley, & Shaver, 1999).

In this study, the IPPA will be selected because it can assess the perceptions of adolescents in the dimensions of relationships with their mother. It can also explain how well attachment figures as grandmother provide a source of psychological security. Therefore, it will be the most appropriate for explaining attachment between adolescent mothers and their own mothers (grandmothers). Moreover, the instrument

is a universal, precise measurement, and has been used in various contexts and populations such as adolescents or students. Finally, it is easy to read and understand.

Factors related to adult attachment in terms of adolescent mothers and their mothers (grandmothers)

The attachment of adolescent mothers and grandmothers is the most useful source for adolescent mothers and their children. According to attachment theory and intensively reviewed relevant literature, significant factors are associated with the adolescent mother-grandmother attachment, including family functioning, grandmother involvement, adolescent parenting stress, social support and partner relationship to examine a causal model of adolescent mother-grandmother attachment. These significant factors can contribute to the attachment model.

Family functioning

Family functioning is recognized to be associated with attachment relationships and individual growth. In particular, the family plays a role in the cognitive and emotional development of each individual (Kapanee & Rao, 2007). Previous studies have examined the relationship between family functioning and attachment relationships, which are defined as a basic family function to provide appropriate conditions for family members to develop physical, psychological, social and other aspects (Dai & Wang, 2015; Miller et al., 2000). According to family concepts, the family plays a basic role in determining members' roles and responsibilities, agreements about delegated roles, justification and logic of roles and responsibilities, planning for accomplishment of liabilities, determining borders for family members, supporting one another in critical situations, creating accurate relationships, maintaining reciprocal trust and responsibility (Jahangir, 2012).

Family functioning is a multi-dimensional concept. For example, the family functioning of Epstein, Bishop, and Levin (1978) divides family functioning into six dimensions by the ability of family to complete the basic tasks including problem-solving, communication, family roles, affective response, affective involvement and behavior control. While Olson (1993) classified family functioning into three dimensions including family intimacy, family adaptability, and family

communication, the work of Beavers and Hampson (2000) divided family functioning that consists of two dimensions as a soft index and a rigid index. The soft index includes affective responses, involvement, behavior control and values and rules. The rigid index included problem-solving, communication and role assignment.

In general, several dimensions of the family, including family processes and family function, have been linked to attachment behavior (Kapanee & Rao, 2007), while less cohesion, support and communication within the family can lead to less attachment (Kullik & Petermann, 2013 ; Miller & Commons, 2010 ; Ronnlund & Karlsson, 2006). In particular, attachment styles in family dynamics may contribute to maintenance from childhood into adulthood (Bartholomew & Horowitz, 1991). For family members, securely attached individuals report significantly higher levels of family functioning including adaptability, cohesion and satisfaction in their original family (Pfaller, Kiselica, & Gerstein, 1998). Mothersead, Kivlighan, and Wynkoop (1998) suggested that family functioning related to distress, and high level of family dysfunction lead to decrease secured attachment. Moreover, they found that increasing family dysfunction related to less parental attachment and more interpersonal distress.

Several studies have found higher levels of family functioning to be associated with positive attachment relationships. For example, in a prospective study of 4,357 university students in 110 universities in Japan to examine how adult attachment was influenced by perceived rearing and current family functioning, Liu, Shono, and Kitamura (2008) reported that current family functioning is univariately correlated with adult attachment. This association is highly dependent on the correlation between perceived rearing and family functioning. Therefore, levels of attachment may be hardly influenced by current family functioning. Moreover, they also found that two dimensions of family functioning, namely, family adaptability and family cohesion, influence attachment relationships.

The study of Kapanee and Rao (2007) examined the effects of attachment styles in relation to family functioning and depressive symptoms with particular focus on attachment styles in relation to family functioning and distress in college students. This sample comprised 124 male and 203 female single undergraduate college students in Bangalore with age ranging between 18-21 years. According to the

findings, adolescents who reported higher levels of family cohesion and better communication patterns within their families also reported higher levels of secure attachment than insecure attachment, because secure attachment is a protective factor against negative psychological outcomes. Moreover, the securely attached reported that their families were higher in the categories of cohesion, expressiveness, active-recreational approach, family sociability, family idealization and democratic family style. Thus, they suggested that families characterized by togetherness, good interpersonal communication, an interest in relating to others in society and an emphasis on individual growth and freedom are associated with secure attachment.

Tanaka et al. (2008) identified the psychosocial correlates of adolescents by using invitation letters to the presidents of all 615 universities in Japan. Questionnaires from participants were completed anonymously and returned by stamped envelopes directly to the research team. They indicated that the three insecure attachment styles were fearful, preoccupied and dismissive, all of which had slightly different correlational patterns. The scores for fearful and dismissive attachment styles that represent poor other images were correlated with low reward dependence while those in the preoccupied attachment style were correlated with high reward dependence.

Rawatlal et al. (2015) conducted a larger collaborative study by examining the associations between attachment patterns, parental support and family functioning from the adolescent and primary caregiver. The subjects (N=206) were recruited from public schools in Durban, KwaZulu- Natal. People from communities were included from Umlazi, KwaMashu, Chatsworth, Phoenix, Umbilo, Newlands and Wentworth during 2012-2013. They reported that the quality of family functioning in terms of communication, cohesion and support has an influence on attachment relationships. In particular, the dimensions of family cohesion, support and communication within family were found to be associated with higher levels of attachment.

The study of Fujimori¹, Hayashi¹, Fujiwara, and Matsusaka (2017) examined the influences of attachment style, family function and gender differences on loneliness in Japanese university students. These questionnaires were included in the University of California at Los Angeles (UCLA) Loneliness Scale, Internal Working Model Scale for assessing attachment and the Family Adaptability and

Cohesion Evaluation Scale III. Stepwise multiple regression analyses were employed to examine the variables' relationships, including a dependent variable, namely, loneliness and independent variables, namely, gender, attachment style and family functions. The results showed that family functioning including cohesion and adaptability were positively and significantly correlated with secure attachment styles ($r = 0.29, p < 0.01$; $r = 0.29, p < 0.01$, respectively), and negatively and significantly correlated with insecure attachment ($r = -0.14, p < 0.05$; $r = -0.16, p < 0.01$, respectively).

Sheftall, Mathias, Furr, and Dougherty (2013) examined the attachment along with broader family functioning in part of family adaptability and cohesion among 236 adolescent psychiatric in-patients with and without histories of suicide attempts. These results found that the associations between attachment, adaptability and cohesion differed by attachment figure. Moreover, significant correlations were found for maternal attachment with adaptability and cohesion.

Likewise, family functioning had the indirect effect on attachment through social support. It may explain that family functioning can enhance social support by increasing skills for requiring support from family members especially grandmother. Thus, they could be improved attachment between adolescent mothers and grandmother. This is consistent with findings of Yurdakul (2018) found that the communication and social skills of adolescent mothers could affect on skills for requiring social support or involvement from other people. Besides, poor interpersonal skills as lack of communication skill with family members may reduce their perceived and actual social support from others (Nilsen et al., 2013).

As previously mentioned, family functioning is associated with attachment behavior. In particular, individuals with secure attachment are related to decreased interpersonal distress. Therefore, it is necessary to note that family functioning factors were significant for adolescent mother-grandmother attachment.

Grandmother's childcare involvement

According to the literature review, grandparents, particularly grandmothers, often play important roles in living with their grandchildren, especially during early childhood (Smith & Drew, 2002). Grandmothers are an important source for providing emotional, financial, instrumental and informational support to their

daughters and grandchildren, which can buffer adolescent mothers from negative psychological consequences (Gordon et al., 2004; Smith & Drew, 2002). In particular, in high-risk group conditions such as adolescent mothers, low socio-economic status or problems with child characteristics, grandmothers are highly involved with their daughters and young grandchildren (Silverstein & Ruiz, 2006; Smith & Drew, 2002). Grandmothers usually provide response, support, care, safety and involvement in the lives of their adolescent mothers and grandchildren (Barnett et al., 2010; Chan & Elder, 2009). Additionally, mothers who live with their mothers are more likely to recreate the mother-grandmother relationship in their relationships with their children such as consistency to support and encourage autonomy (Silberman, 2016).

Grandparent involvement is viewed as an important source of emotional, financial and instrumental support that can buffer parents from adverse psychological consequences. However, intergenerational relationships can both exacerbate parenting stress and protect against parenting stress (Gordon et al., 2004). Grandmothers who live with their families may receive greater respect, authority and status within the family, because they are often viewed by their adolescent mothers and grandchildren as ancillary figures (Chang, Yi, & Lin, 2008; Pong, Johnston, & Chen, 2010). The qualities of the mother-grandmother relationship as the mother-grandmother mutuality have been defined as an affection, closeness and warmth in relationships (Baumann, Kuhlberg, & Zayas, 2010; Levitt, Guacci, & Weber, 1992; Silberman, 2016). However, living with grandmothers and childcare involvement are also associated with strains in mother-grandmother relationships (Apfel & Seitz, 1991; Grau, Wilson, Weller, Castellanos, & Duran, 2012). Relationship strain was found in multigenerational households and may lead young grandmothers to added caregiving stress from a new baby into the household or disagreement about parenting approaches between mothers and grandmothers (Apfel & Seitz, 1991). This relationship strain can have impact on mother-child interactions while less relationship strain can lead to more competent parenting behaviors (Sellers, Black, Boris, Oberlander, & Myers, 2011; Silberman, 2016).

Involvement in childcare has been considered a multidimensional construct with multiple domains (Singh et al., 1995). In particular, the involvement of grandmothers has several dimensions. Cabrera, Shannon, West, and Brooks-Gunn

(2006) identified grandmother involvement as parental engagement in terms of frequency of didactic care such as singing songs, reading stories; physical play such as playing with toys; and care-giving such as bathing and feeding children. Cook and Roggman (2010) also categorized grandmother involvement into two groups including intergenerational cohabitation, child rearing, seeing, and levels of helping to raise their grandchildren. Silberman (2016) viewed grandmother involvement as a complex relationship having many different types of grandmother support such as emotional reassurance, advice, financial support and child-care support. Moreover, the model of Lamb, Pleck, Charnov, and Levine (1987) has been widely used to conceptualize paternal involvement into three categories including interaction as a one-on-one interaction with the child, including feeding, playing and reading; accessibility and availability to the child; and responsibility in both child care and welfare.

Empirical studies have found that grandmother involvement has an influence on attachment relationships (Cook & Roggman, 2010). It also affects attachment and parenting outcomes. Involvement, warmth and responsiveness from parents, especially mothers, are important predictors of secure attachment while a low level of paternal involvement, insensitivity and inconsistent parenting is related to insecure attachment (Bates, Maslin, & Frankel, 1985; Crockenberg, 1981; van Schaick & Stolberg, 2001). One study suggested that adolescent mothers who received more involvement from their mothers tended to have high levels of secure attachment, because high levels of involvement related to high levels of intimacy, commitment and trust in the relationships lead to secure attachment (Barnett et al., 2016; Cook & Roggman, 2010; van Schaick & Stolberg, 2001). According to the attachment theory, the quality of attachment relationships is shaped by the sensitivity and responsibility of caregivers who interact with their infants (Ainsworth et al., 1978; J. Bowlby, 1980; DeWolff & van Ijzendoorn, 1997). Similar to infants, attachment relationships in adults are purposed to provide a safe haven for an individual or a place to turn to in times of distress wherein the attachment figure will provide comfort and reassurance (Hazan & Shaver, 1994). However, maternal rejection of physical contact, maternal inconsistency and lack of sensitivity and responsiveness are more likely to foster an insecure attachment style (Ainsworth et al., 1978; Katowitz, 2007; Vondra, Shaw, & Kevenides, 1995).

Parenting stress

Parenting requires the ability to form strong emotional connections with others such as the ability to organize, plan and exhibit self-control. Parents with secure attachment styles tend to be more responsive, sensitive, involved and active in forming a secure foundation for a young child to explore, learn and develop (Ainsworth, 1979; J. Bowlby, 1982a). In particular, parenting stress is defined as specific difficulties in adjusting to the parenting role and the normative approach as the role related to stress that involves a parent's emotional, and behavioral responses to some unpleasant events that affect parental well-being (Abidin, 1995; Crnic & Low, 2002; Lubiewska & Derbis, 2016; Seginer et al., 2002). However, several studies have indicated that adolescent mothers have more problems about transition to motherhood and new responsibility, socio-economic status, mother-daughter relationships, a lack of social support and increasing vulnerability (Garner et al., 2013; Mazzeschi, Pazzagli, Radi, Raspa, & Buratta, 2015). Thus, the transition to the new maternal role leads to parenting stress and a common risk factor for health and social problems among adolescent mothers.

Several studies have indicated that stress creates susceptibility to changes in attachment style (Cozzarelli, Karafa, Collins, & Tagler, 2003; Davila, Bradbury, Cohan, & Tochluk, 1997; Davila & Cobb, 2003). Thus, parenting stress could have an influence on attachment between adolescent mothers and grandmothers. It is also associated with the attachment by perception of stress, which can inhibit secure attachment and activate attachment insecurity when adolescent mothers do not receive responsiveness or are neglected by attachment figures (Feldman, 2007; Lubiewska & Derbis, 2016; Nakagawa et al., 1992; Riggs & Han, 2009). A study by Nakagawa, Teti, and Lamb (1992) found a negative relationship between level of parenting stress and attachment security. Thus, this finding means participants who report high levels of parenting stress also report low attachment security. Moreover et al. (2011) reported that mothers who experienced fewer stressful events and higher perceived social support are associated with decreased attachment anxiety.

Under conditions of low stress, perceptions of social support can lead to changes in attachment anxiety. During highly stressful conditions, social support and

attachment anxiety do not influence one another. Additionally, Lubiewska and Derbis (2016) reported that parenting stress was associated with attachment insecurity. They indicated that the parenting stress of mothers was a negative predictor of life satisfaction.

Social support

Social support has been viewed as the most important source for adolescent mothers. In adolescent mothers, their own mothers and partners the most primary social resources and are identified as a common source of support (Gee & Rhodes, 2007; Laghi, Baumgartner, Riccio, Bohr, & Dhayanndhan, 2013; Oldehinkel et al., 2011). Importantly, mothers of adolescent mothers (grandmothers) have been identified as their closest and most consistent support figure providing emotional and tangible support, financial assistance, cognitive guidance and childcare support (Devito, 2010; Laghi et al., 2013). However, adolescent mothers' partners frequently fail to provide consistent support for adolescent mothers (Castellanos, 2013).

Social support is a multifaceted construct with six identified functions including emotional, cognitive, tangible, social, positive feedback and child care support (Cauce, Mason, Gonzales, Hiraga, & Liu, 1996; Cohen & Wills, 1985; Colleta & Lee, 1983; Thompson, Flood, & Goodvin, 2006; Wan, Jaccard, & Ramey, 1996). These functions were grouped into instrumental (tangible, child care) and non-tangible (emotional, cognitive guidance, positive feedback, socializing). It is defined as a voluntary act from one individual given to another individual and presented in immediate or delayed positive responses to the recipient (Hupcey, 1998). It has different forms of support, including informational, physical, emotional, instrumental, and appraisal support (Logsdon & Koniak-Griffin, 2005). It also plays a direct role in promoting recovery from stress and crisis experiences in addition to serving as a buffer against the effects of stress, including guidance, emotional support and tangible support. Moreover, social support helps reduce environmental stressors and allows mothers to cope with their insecurities with pregnancy and infant care. Social support improves the mothers' feelings of attachment to her infant (Diniz, Koller, & Volling, 2015).

Social support has been found to be associated with attachment by increasing feeling of security, life satisfaction, capacity to seek and awareness to

receive help from attached figures, and encouragement about reciprocity (Green et al., 2011 ; Moller et al., 2003; Shahyad et al., 2011). In particular, feelings of security can develop into attachment security when an attachment figure provides consistent availability and responsiveness. On the other hand, if a person receives inconsistency, unavailability or unresponsiveness from an attachment figure, then attachment insecurity develops (Mikulincer & Shaver, 2003, 2007; Stanton & Campbell, 2014). Moreover, receiving consistent social support and a high level of satisfaction with the level of support provided is associated with increasingly secure attachment (Priel & Shamai, 1995).

A study by Green et al. (2011) examined whether attachment styles and social support reciprocally influence each other over time. According to the findings, mothers with fewer stressful life events and increasing social support led to increased attachment security. Recently, Bernardon, Babb, Hakim-Larson, and Gragg (2011) found that insecurely attached students reported high levels of social, family, and romantic loneliness.

Several studies of social support were explained correlation with partner relationship. It indicated that lower levels of support reduced relationship satisfaction and increases instability with partner (Khan & Aftab, 2013; Katz, Beach, & Anderson, 1996; Kurdek, 2005; Overall1, Fletcher, & Simpson, 2010; Pasch & Bradbury, 1998). Moreover, previous study indicated that perceived social support from social networks buffered the negative effects of the relationship and marital satisfaction. The perceptions of social support from their social networks can predict relationship within family and marital satisfaction (Gee & Rhodes, 2003; Khan & Aftab, 2013).

Partner relationship

During the adolescent period, primary attachment figures transfer from parents to peers or partners in a process that begins in late adolescence or early adulthood (Dinero et al., 2008; Fraley & Davis, 1997). Generally, partners are one of the most primary social resources for adolescent mothers and have been identified as a common source of social support (Gee & Rhodes, 2007; Oldehinkel et al., 2011), particularly in the case of the low-income group. However, partners of adolescent mothers are characterized as unstable, transient and conflictual. Their romantic relationships are more likely to have instability and inconsistency in the provision of

support (Castellanos, 2013; Devito, 2007; Miller, Duncan, Brown, Sparks, & Claud, 2003). Moreover, relationships with partner can have both positive and negative aspects (Castellanos, 2013; Gee & Rhodes, 2007) and have also been found to have influence on attachment. Adolescent mothers who are satisfied with partner relationships tend to have low stress and increase social support (Cramer, 2003; Shahyad et al., 2011).

Several findings have indicated that partner relationships are associated with attachment representation and subsequent relationships with others may reflect changes in attachment style and a move away from its original form (Dinero et al., 2008; Mikulincer & Shaver, 2003, 2007). The quality of attachment relationships within the family and the partner relationship may influence the quality of another attachment relationship as in the parent-child dyad or adolescent mother-grandmother dyad (Woodhouse, Dykas, & Cassidy, 2009). Adolescents or young adults who have greater romantic involvement are associated with stronger attachment to partners and lower attachment to mothers and friends (Feeney, 2004).

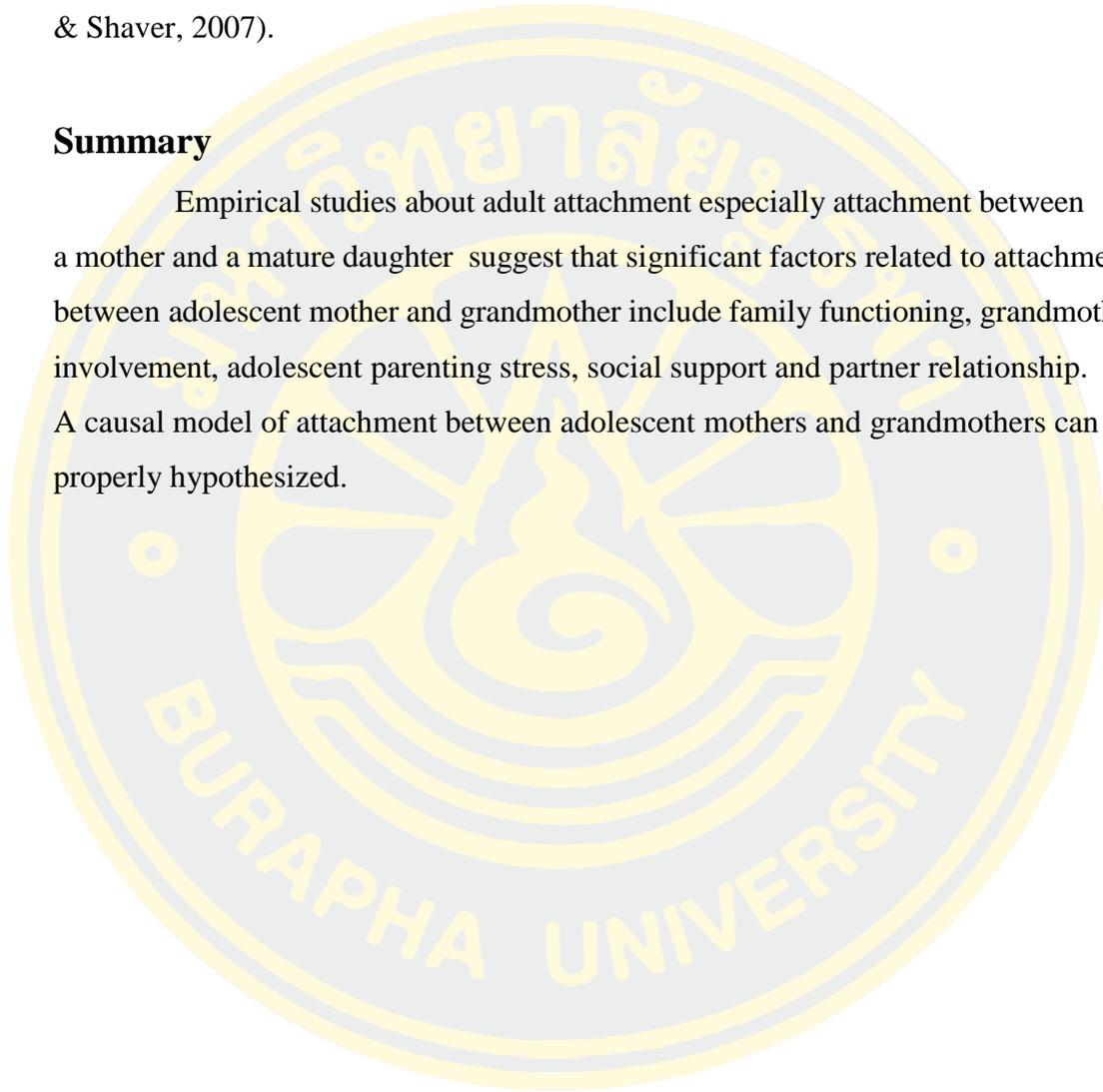
Partner relationship is a part of family relationships. According to Ainsworth (1989), family attachment has been defined as an enduring emotional bond with either parents or peers. Satisfaction with partner relationships such as marital satisfaction is associated with attachment behavior. Marital satisfaction has greater influence over secure attachment (Feeney, 1996). Increasing levels of marital satisfaction tend to have highly responsive and available care from partners that restore feelings of security, worthiness of love, trust to provide love and support and increased attachment security (Alder, Yorgason, Sandberg, & Davis, 2018; Bowlby, 1969; Feeney, 1996). Thus, these findings indicate that romantic partners and relationship satisfaction influence attachment. For instance, Woodhouse et al. (2009) examined the secure base provision in the context of the family. The participants were 189 adolescents from two-parent families and their parents. They found that a parent who can rely on and receive support from their spouse during distress gain more benefits and security.

Romantic or partner relationships are an important source of emotional support for adolescents (Connolly, Craig, Goldberg, & Pepler, 1999). The importance of parental attachment decreases due to increasing romantic relationship, which

becomes the primary basic source of support and intimacy for adolescents (Overbeek, Vollebergh, Engels, & Meeus, 2003). However, individuals who have been rejected by their partners are related to more anxious attachments and have a low threshold for perceiving situations in the environment as threatening to the relationship (Mikulincer & Shaver, 2007).

Summary

Empirical studies about adult attachment especially attachment between a mother and a mature daughter suggest that significant factors related to attachment between adolescent mother and grandmother include family functioning, grandmother involvement, adolescent parenting stress, social support and partner relationship. A causal model of attachment between adolescent mothers and grandmothers can be properly hypothesized.



CHAPTER 3

RESEARCH METHODOLOGY

This study aims to test a causal model of adolescent mother-grandmother attachment. This chapter presents the research design, population and sample, research instruments, protection of human rights, data collection procedures and data analyses.

Research design

A model-testing design was used to determine the influence of five predictors on adolescent mother-grandmother attachment, including family functioning, grandmother-childcare involvement, parenting stress, partner relationship and social support. This design was appropriate for clarifying the factors influencing this attachment and appropriate for testing the accuracy of the hypothesized causal model.

Population and sample

Population

The population of this study was adolescent mothers-who brought their baby to receive vaccination or routine care at the well-baby clinic at Tambon Health Promoting Hospitals (THPHs) the eastern region of Thailand

Sample

The sample was recruited through the target population. The inclusion criteria for the sample recruitment were as follows:

1. Aged under 19 years,
2. Delivery of the first child,
3. Currently living with the adolescent's own mother in the same home for at least 6 months,
4. Be a biological mother of an infant aged more than 6 months with no congenital anomaly or serious health condition,
5. Either living or not living at the same home with partner, and
6. Ability to read, write and communicate in Thai.

Sample Size

According to the complex analysis of structural equation modeling (SEM), the sample size is an important consideration for the estimation and interpretation of SEM results (Hair, Black, Babin, Anderson, & Tatham, 2006). The sample size was suggested that the absolute minimum sample size must be at least greater than the number of covariance or correlations in the input data matrix in order to be sufficient for estimating and analyzing the results of the SEM (Hair, Anderson, Tatham, & Black, 1998 ; Kline, 2011; Schumacker & Lomax, 2010). A ratio of 5 or 10 cases per parameter estimated are recommendation for calculation sample size by using estimated parameter (Hair et al., 1998). Moreover, a minimum ratio of sample size at least five respondents for each estimated parameter is typical minimum ratio. Therefore, based on recommendations, this study estimated a minimum sample size of 240 cases based on estimated parameters (20 errors, 12 loading, 6 variances of factors, and 10 regression weights)

Setting of the study

The eastern region of Thailand consists of seven provinces including Chanthaburi, Chachoengsao, Chon Buri, Trat, Prachin Buri, Rayong, and Sa Kaeo Provinces. The region consists of 2,927,819 households and is divided into 69 districts and 529 sub- districts (Department of Provincial Affairs, 2016). The eastern region has a total of 73 secondary and tertiary hospitals and 774 health promoting hospitals. In 2016, the population statistics were 2,902,558 for males and 3,021,281 for females (Department of Provincial Affairs, 2016), and female adolescents aged 15-19 years accounted for 152,309 of the population (Bureau of Reproductive Health, 2015). In particular, the number of adolescent mothers in this group was 8,497 cases in 2016 and the birth rate was 55.8 per 1,000 females among adolescents aged 15-19 years. The highest rate of adolescent birth rate among adolescents aged 15-19 years was reported at Chon Buri province as 65.3 and the lowest rate at Chanthaburi province as 47.7 (Bureau of Reproductive Health, 2015).

Sampling

The participants were recruited by using a multi-stage random sampling technique. Each step was calculated for representation of 25-30 percent of the total population (Neuman, 1991) as follows:

Step 1: The names of the provinces in the eastern region were selected by cluster random sampling. Each of the names of the seven provinces was written on a piece of paper; all of these names were placed in a box and mixed well. Next, the researcher picked one name of a province out of the box to obtain a sample. Each name of the eastern region province was replaced before the next name was picked. Finally, the names of two provinces were selected from a total of seven provinces.

Step 2: Each of the two provinces was randomly selected as the representative district for 25-30 percent of the representation in the above process.

Step 3: After randomly selecting the districts, each district had sub-districts randomly selected by using 25-30 percent of the representation in the above process.

Step 4: The representative Tambon Health Promoting Hospitals from each sub-district were selected by using a convenience sampling technique.

Step 5: A convenience sampling technique was used to recruit participants who met the inclusion criteria for the study. Finally, a total of 240 participants were recruited. The sampling technique was shown in Figure 3.

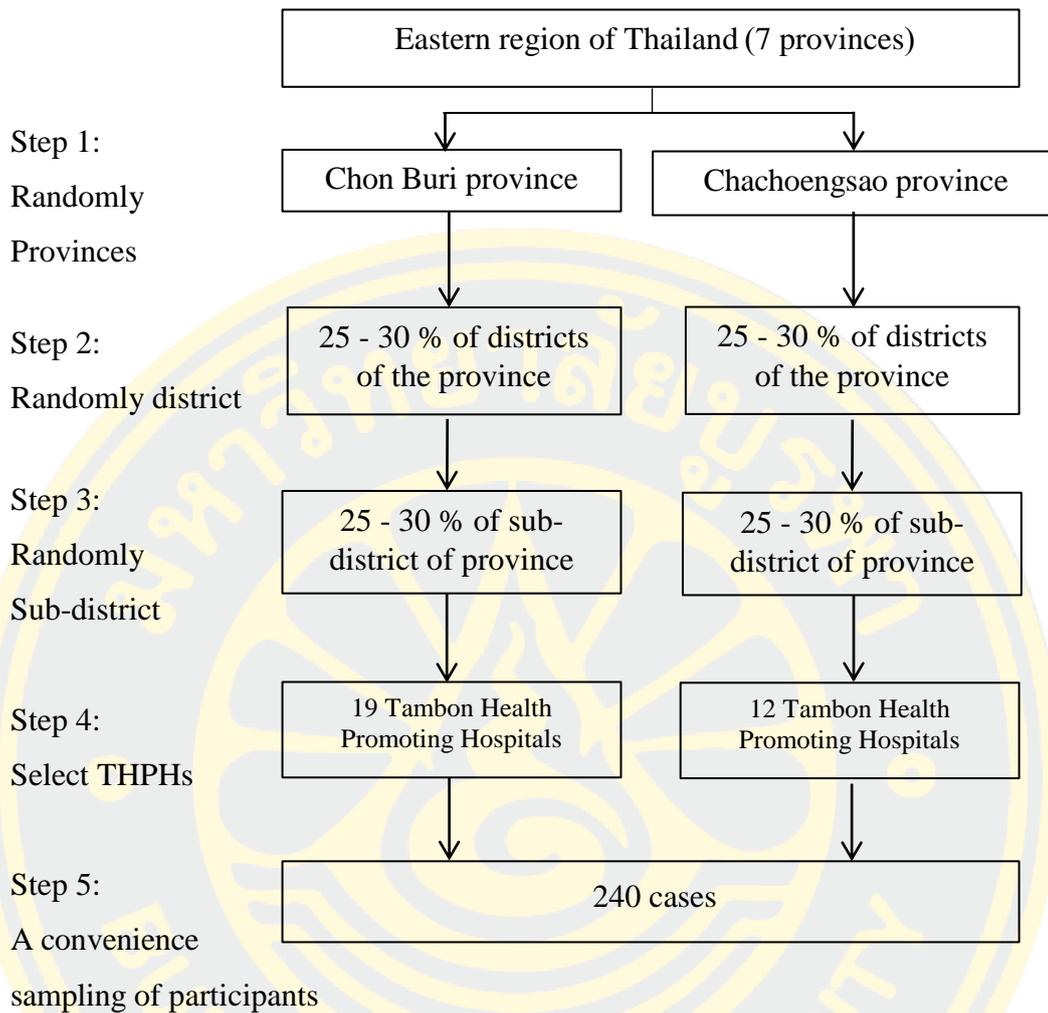


Figure 3 The sampling technique for obtaining participants in this study

Research instruments

The research instruments included five self-report questionnaires which used to measure the dependent variable and all independent variables, including family functioning, grandmother childcare involvement, parenting stress, partner relationship and social support. There were the demographic questionnaire, the Inventory of parent and peer attachment [IPPA-Thai version], the Chulalongkorn family inventory [CFI], the maternal grandmother involvement scale-Thai version, the parental stress scale [PSS-Thai version], the Postpartum support questionnaire [PSQ-Thai version], and the relationship quality scale [RQ scale-Thai version]. Participants were used an adequate time period of 30-40 minutes after the adolescent mothers' children had met

with the physicians and received routine care. The researcher clearly explained the questionnaire to assist in completing the data, and monitor the completeness of questionnaire administration. The details of all research instruments were described below.

1. A demographic questionnaire

The sample characteristics were measured by using a demographic questionnaire developed by the researcher and used for collecting the data on the participants and family information including age, marital status, education, occupation, income, employment, living arrangements, financial status, relative person who lives with the adolescent mother and number of person who live with the adolescent mother.

2. The inventory of parent and peer attachment [IPPA]

Adolescent mother-grandmother attachment was measured by the IPPA (for mother), which was developed by Armsden and Greenberg (1987) and was used to assess adolescents' perceptions of the positive and negative affective/cognitive dimension of relationships with their parents and close friends. In particular, the instrument was used for assessing how well these figures serve as sources of psychological security. The original attachment theory by Bowlby (1969) and recently expanded by others were used as the conceptual framework of this instrument. The IPPA was divided into three parts of the attachment figure's scale including mother, father, and peer for assessing each attachment. The first part, mother section was measured attachment between adolescent and mother. Next, father section was measured attachment between adolescent and father. Finally, peer section was measured attachment between adolescent and peer (Armsden & Greenberg, 1987; Gullone, & Robinson, 2005).

In this study, however, a part of maternal attachment was used to measure the adolescent mother-grandmother attachment. This part of the measurement was composed of 25 items with three dimensional assessments including trust (10 items as 1, 2, 3, 4, 9, 12, 13, 20, 21, and 22), communication (9 items as 5, 6, 7, 14, 15, 16, 19, 24, and 25), and alienation (6 items as 8, 10, 11, 17, 18, and 23). The negative items including 3, 6, 8, 9, 10, 11, 14, 17, 18, and 23 were reverse scored before summing. The participants were asked to rate their responses on a 5-point Likert scale from 1 (almost never or never true) to 5 (almost always or always true). The total possible

scores ranged from 25-125 in which higher scores were indicated more attachment security and lower scores were indicated less attachment security. The IPPA-mother was well-validated and reliable (Armsden & Greenberg, 1987). Several studies had reported that the reliability of this instrument ranges from 0.85-0.96 (Cunha, Relvas, & Soares, 2009; Moller et al., 2003; Potard, Courtois, Réveillère, Bréchon, & Courtois, 2017). Therefore, this measurement showed high levels of reliability and internal consistency. All items were originally constructed in English and were translated into Thai by the researchers using the back translation technique (Brislin, Lonner, & Thorndike, 1973; Cha, Kim, & Erlen, 2007).

The item total correlation [ITC] or item discrimination indexes was used to measure the reliability of multi-item scale for improving such scales. It is the correlation between an individual item and the overall assessment score. The minimum acceptable of ITC is range of .15 to .02 indicated a good item (Clark & Watson, 1995). The IPPA was tested the ITC and three items that have ITC less than .02 were deleted including item 3, 9, and 14. Therefore, for this study 22 items of the IPPA were analyzed and the Cronbach's alpha of IPPA-Thai version was 0.85.

3. The Chulalongkorn family inventory [CFI]

Family functioning was measured by the CFI. The CFI developed by Trangkasombat (2006) and based on the McMaster family assessment device [FAD] by Epstein, Baldwin, and Bishop (1983). This scale was already in the Thai language. It includes 36 items on containing seven dimensions, including problem solving (6 items as 1, 2, 3, 8, 25, and 26), communication (5 items as 9, 16, 23, 28, and 31), role function (3 items 10, 17, and 19), affective response (5 items as 4, 11, 18, 34, and 35), affective involvement (5 items as 5, 12, 21, 24, and 33), behavior control (4 items as 13, 6, 27, and 30), and overall function (8 items as 7, 14, 15, 19, 20, 22, 32, and 36). The negative items including 3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, and 36 were reverse scored before summing. The CFI were completed by the participants and rated on a 4-point Likert scale from 1 (strongly agree) to 4 (strongly disagree). Total scores ranged from 36 to 144 points with higher scores indicating better family functioning and lower scores indicating poorer family functioning. The CFI was well-validated and reliable with internal consistency for the subscales ranging from 0.88 to 0.92 and the instrument had been used in previous studies about adolescents, parents and

caregivers (Leelatrakarnkun & Trangkasombat, 2012; Trangkasombat, 2006; Wanna & Lueboonthavatchai, 2015). This study, six items of the CFI less than .02 were deleted as items 3, 9, 11, 13, 18, and 19. Finally, 30 items of the CFI were analyzed the SEM analysis and the Cronbach's alpha of the CFI was 0.84.

4. The maternal grandmother involvement scale

Grandmother childcare involvement was measured by the maternal grandmother involvement scale developed by Baumann et al. (2010). It includes 3 items regarding the involvement of grandmother with children. The respondents (mothers) were asked to rate the involvement of their own mothers with their children on each items that described as follow. First item, "how involved their own mothers were in raising their child" mothers rate on a 3-point Likert scale ranging from 1 (not at all involved), 2 (somewhat involved), and 3 (very involved). Second item, "how often their own mothers saw their children" mothers rated on a 6-point scale ranging from 1 (never), 2 (once a year), 3 (a few times a year), 4 (once a week), 5 (a few times a week), and 6 (every day). Third item, "how much help their own mothers provided in raising their children" mothers rated on a 4-point scale ranging from 1 (none at all), 2 (little), 3 (some), and 4 (a lot). The score of grandmother involvement was calculated by the mean of the standardized mean of each item with higher scores indicating higher levels of grandmother involvement and lower scores indicating less involvement. The reliability of the Maternal grandmother involvement was alpha at 0.72 (Baumann et al., 2010). The scale was originally constructed in English. Later on, it was translated into Thai by the researchers who was used the back translation technique (Brislin et al., 1973; Cha et al., 2007) and with permission from the developers. This study, all items of the maternal grandmother involvement scale showed the ITC more than .02 and the Cronbach's alpha was 0.82. Therefore, all items were used to analyze the SEM analysis.

5. The parental stress scale [PSS]

Adolescent parenting stress was measured by the PSS, which was developed and designed by Berry and Jones (1995) to measure the levels of stress experienced by parents. The theoretical underpinning of the PSS was a transactional model of stress and the view of the PSS was stemming from an interaction between parents and children that was a result of the bidirectional process (Berry & Jones, 1995).

The instrument contains 18 items self-report and measures factors in two subscales including parenting stress (10 items as 3, 4, 9, 10, 11, 12, 13, 14, 15, and 16), and lack of parental satisfaction (8 items as 1, 2, 5, 6, 7, 8, 17, and 18). The PSS is brief and easy to administer and was completed by the participants who rated on a 5-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = undecided, 4 = agree, and 5 = strongly agree). The positive items including 1, 2, 5, 6, 7, 8, 17, and 19 were reverse scored before summing. The possible range of the PSS was 18 to 90 in which higher scores indicated high parental stress and lower scores indicated less parental stress. This instrument is one of the most commonly used tools to measure and operationalizes the stress of parental experience differently than do other measures. It has specificity for queries parenting stresses and widely used with numerous populations, including clinical and nonclinical samples (Berry & Jones, 1995; Lessenberry & Rehfeldt, 2004). Berry and Jones (1995) reported good psychometric properties including reliability for the scale with a coefficient of 0.83 and a mean inter-item correlation of 0.23. Moreover, they reported a 6-week test-retest correlation was .81. The PSS was originally constructed in English. Later on, it was translated into Thai by Payjapoh (2017) under the permission from the developers and reported the Cronbach's alpha coefficient of this Thai-version between 0.81 to 0.89 (Klongdee, Nintachan, & Sangon, 2016; Payjapoh, Kongsaktrakul, & Vallibhakara, 2017). This study, two items of the PSS-Thai version as 2 and 4 were deleted and the Cronbach's alpha was .80. Therefore, 16 items of PSS were analyzed with SEM analysis.

6. The postpartum support questionnaire [PSQ]

Social support was assessed by the PSQ. The PSQ was developed by Logsdon, McBride, and Birkimer (1994) to measure of perceived support specific to the postpartum period. The PSQ contains a 34-item measuring mothers' need and acquisition of social support in four dimensions: Material support (9 items as 1, 5, 8, 9, 11, 19, 22, 23, and 30), emotional support (10 items as 2, 10, 12, 13, 15, 20, 25, 27, 33, and 34), informational support (10 items as 3, 6, 7, 14, 17, 21, 24, 26, 28, and 31), and comparison support (5 items as 4, 16, 18, 29, and 32) during the postpartum period, which scored on an 8-point Likert scale ranging from 0 "no support" to 7 "a lot of support". The total of PSQ scores range from 0 to 238 with higher scores indicates a greater social support and lower scores indicates low social support during postpartum

period. The PSQ has good psychometric properties, internal reliability, test-retest reliability, and robust factorial validity. The Cronbach's alpha coefficient of the subscales and total scales ranged from .90 to .94 (Logsdon, Usui, Birkimer, & McBride, 1996). Especially, the reliability of this instrument for postpartum adolescent mothers was 0.93 (Logsdon, Birkimer, Simpson, & Looney, 2005).

The original English version of PSQ was translated into Thai version and modified from 8-point Likert scale to 5-point Likert scale by Wongvisetsirikul (1997). In Thai version, the PSQ score ranged from 1 (no support) to 5 (a lot of support), a total score ranged from 34 to 170 with higher scores indicating a greater social support and lower scores indicating low social support during postpartum period (Wongvisetsirikul, 1997). It was completed by the participants and rated on a 5-point Likert scale as above. The PSQ-Thai version was used in Thai postpartum mothers and this Cronbach's alpha coefficient was 0.95 (Suriyanimitsuk, Deoiseres, Wongnum, & Williams, 2015). One item of PSQ-Thai version as item-10 was deleted from the overall assessment items and 33 items were analyzed with SEM analysis. The Cronbach's alpha of PSQ-Thai version was 0.93.

7. The relationship quality [RQ] scale

Partner relationship was measured by the relationship quality [RQ] scale. It was developed by Chonody et al. (2018) to assess an individual's perception of his or her relationship quality in their current partnership. Relationship quality can measure partner relationship because relationship quality is often used interchangeable with relationship, marital satisfaction, an essential aspect to understand how individual create enduring coupledom, and one of the key areas of intimate relationship assessment. The RQ scale is a newly short 9-item self-report and focused on positive elements of the relationship. It is easy to administer and has the capacity to be used with a wider and general population as a community sample. The items were completed by the participants and rated on a 5-point Likert scale ranging from 1 (strongly disagree), 2 (disagree), 3 (neutral), 4 (agree), to 5 (strongly agree). Total scores ranged from 9 to 45 in which higher score meaning greater relationship quality and lower score meaning lesser relationship quality. It reported high internal consistency reliability with a Cronbach's alpha at 0.89 (Chonody et al., 2018).

The original of the RQ scale constructed in English and was translated into Thai by the researchers using the back translation technique (Brislin et al., 1973; Cha et al., 2007). All items of RQ-Thai version presented the ITC above 0.2, and were analyzed with SEM analysis. The Cronbach's alpha of the RQ-Thai version was 0.94.

Back translation technique

The original English version of the IPPA, the maternal grandmother involvement scale, and the RQ were translated into the Thai language by using the back translation technique (Brislin et al., 1973; Cha et al., 2007). It is an essential method for the cross-cultural application of existing measures and is used as a guideline to translate original English versions of instruments into Thai versions. First, the original English version of the IPPA, the maternal grandmother involvement, and the RQ were translated independently into Thai by two bilingual translators who are fluent in both languages. The translators have received doctoral degrees in nursing science and are familiar with the content involved in the adolescent and maternal field. They translated the contents by conveying the precise meanings and statements from the original measurement. These translated contents equivalent clearly relay the main ideas from the original English version.

Second, all translated Thai versions were translated independently back into English versions by two bilingual translators who have not seen the original versions of all instruments. These translators have received the doctoral degrees in linguistics science and have also been English instructor at the Burapha University Language Institute and International College for Sustainability Studies, Srinakharinwirot University. Finally, the back-translated versions of the IPPA, the maternal grandmother involvement, and the RQ were compared and reviewed for accurate interpretation between the original version and back-translated versions by the principal investigator [PI] and the major advisor who are both bilingual and familiar with the issues of adolescent mothers. They compared the contents in terms of cultural acceptability as well as the consistency of grammar and structure of each item. If the items have any discrepancies, the PI and the major advisor discussed the matter and revise for agreement with appropriate equivalence with real situations.

Psychometric properties of the measures

The instruments of this study included the IPPA-Thai version, the CFI, the maternal grandmother involvement scale-Thai version, the PSS-Thai version, the PSQ-Thai version, the RQ Scale -Thai version, and the demographic questionnaire. The instruments in English-version were permitted from the developer and will conduct pilot study to test their psychometric properties including validity and reliability.

Validity

First, the content validity of the CFI, the PSS-Thai version, the PSQ-Thai version has been validated in previous studies and also has been evaluated in Thai sample. Especially, the PSS-Thai version and the PSQ-Thai version have been translated into Thai by using back translation technique and have been administrated in Thai. Therefore, in this study, they are not required to validate its content validity again.

Second, the Thai version of IPPA, maternal grandmother involvement, and RQ scale have been translated into Thai by using back translation technique in which these content validity and cultural comparability could be ensured. Especially, the content validity of these instruments has been validated in term of appropriate language from the expert. The panel of experts included nursing instructors who are fluent in both languages and familiar with the content involved in the adolescent and maternal field. However, the construct validity of each instrument was assessed in this study using confirmatory factor analysis, which was carried out under the AMOS program to estimate the specified measurement model.

Reliability

The internal consistency reliability of all study instruments were evaluated by using internal consistency which Cronbach's alpha is 0.80 or above for acceptable reliability (Hair et al., 2006). This study tested the reliability of instruments from a sample of 240 adolescents. In this study, the Cronbach's alpha of IPPA-Thai version was 0.85, CFI was 0.84, maternal grandmother involvement-Thai version was 0.82, PSS-Thai version was 0.80, PSQ-Thai version was 0.93, and RQ scale-Thai version was 0.94. The results indicated that all of these instruments were good reliability.

The summary of the instruments used in this study are shown in Table 1.

Tables 1 The summary of reliability of the instruments

No	Instrument	Source	Reliability	Items	Remark
1	The IPPA (part: Mother attachment)	Armsden and Greenberg, (1987)	$\alpha = 0.85$	25	Thai-version (translated by the researcher)
2	The CFI	Trangkasombat (2006)	$\alpha = 0.84$	36	Thai-version
3	The maternal grandmother involvement	Barenett, Scaramella, Neppl, Ontai, and Conger (2010)	$\alpha = 0.82$	3	Thai-version (translated by the researcher)
4	The PSS Thai version	Berry and Jones (1995)	$\alpha = 0.80$	18	Thai-version
5	The PSQ-Thai version	Logsdon et al. (1994)	$\alpha = 0.93$	34	Thai-version
6	The RQ scale	Chonody, Gabb, Killian, and Dunk-West (2016)	$\alpha = 0.94$	9	Thai-version (translated by the researcher)

Protection of human rights

This study was approved by the Institutional Review Board (IRB) from the Faculty of Nursing, Burapha University, and the provincial public health offices. The participants were asked to voluntarily participate and were informed about the research objectives, benefits, potential risks, withdrawal and confidentiality. The researcher recruited the participants based on their willingness to sign informed consent forms. All participants had the right to refuse to participate in the study and withdraw at any time during the process of the study with no requirement to provide reasoning and no impact on health services at the health promoting hospitals. All data

acquired from this study would be kept strictly confidential. The questionnaires of this study and data analysis were assigned by using only code numbers instead of name for strict confidence. All of the findings were reported as grouped data without mentioning of personal identities. After collecting and analyzing the questionnaires, the researcher sealed and placed them in a locked locker until this study was published. All data and hard copy of participants were kept in a locked locker, every soft file was saved in a password-protected personal computer, and no one able to access to this data except the researcher and the major advisor. All data were used only for this research study. The data will be completely destroyed after the finding published or presented.

Data collection procedures

Details of data collection procedures are explained as follows:

1. After this research proposal was approved from the Institutional Review Board (IRB) for graduate study, Faculty of Nursing, Burapha University. The researcher submitted it to the IRB of the provincial public health offices of Chachoengsao, Chon Buri, and Rayong provinces.
2. A letter of introduction and request for permission to conduct the study from the Faculty of Nursing, Burapha University was submitted to the directors of the health promoting hospitals of Chachoengsao and Chon Buri provinces.
3. All data were collected by the researcher. The researcher selected the sample population by going to well-baby clinic at the tambon health promoting hospitals, studying the mother and child health handbook and inviting adolescent mothers who met the inclusion criteria and interested in participating. Then the researcher introduced herself, build rapport with the subjects and explained the objectives, data collection methods and duration of the study, also informing the subjects of their rights to agree or refuse to participate in the study.
4. The data were collected by self-report questionnaires in the health promoting hospitals by using an adequate time period of 30-45 minutes after the adolescent mothers' children met with the physicians, vaccination, and received routine care. The informed consent form was signed by participant who agree to participate.
5. All participants completed all of questionnaires in the private room.

6. The researcher clearly explained the questionnaire to assist in completing the data, and monitored the completeness of questionnaire administration.

7. In case of the participants who aged under 18 years and willingness to participate in this study. These participants received the participant's information sheet and assent form from the researcher to serve it to their own mothers. Their mothers also were informed about the objectives, data collection methods, benefits of research, the protection of human subjects, and duration of the study from participant's information sheet and that they could refuse to participate at any time. The assent form was signed by mother of participants who agree to participate. Then, the participants, who aged under 18 years, send the assent form that signed already to the research in next vaccination follow up. Finally, the participants completed all of self-reported questionnaires.

8. After completing data collection, the researcher confirmed with the participants to double check each page of the questionnaires before returning them.

9. The obtained data were analyzed by proper statistical methods.

Data analyses

A statistical computer software program was used to analyze the data. The significance level was set at $p < .05$. The details of the analyses were presented as follows:

1. Descriptive statistics were used to describe the demographic characteristics of the samples and all study variables.
2. The magnitudes of both direct and indirect causal effects on adolescent mother-grandmother attachment were analyzed with structural equation modeling [SEM] by using AMOS program.

CHAPTER 4

RESULTS

This chapter presents the findings of this study. The first part describes characteristics of the participants. The second part presents the assumption testing for the structural equation modeling. The third part describes description of the study variables, including attachment, family functioning, grandmother involvement, parenting stress, social support, and partner relationship. The final part explains the testing of the hypothesized model and research hypotheses.

Part 1: The participants' characteristics

The participants included 240 adolescent mothers. The demographic characteristics of the participants were presented in Table 4-1. Their age ranged from 14-19 years with a mean of 17.80 ($SD = 1.29$). The majority (69.6 %) of them was living with spouse without marriage license and had unplanned pregnancy (55.8 %). Half of them (50.8 %) had completed lower secondary school, unemployed (45.4 %), family's monthly earning of 10,001-20,000 Thai Baht (52.08 %). Most of them (58.34 %) lived with mother, family members, and spouse.

Age of the participants' mother ranged from 36-63 years with a mean of 44.96, ($SD = 6.28$). Most of them were employee/ laborers (45.8 %) and had completed primary school (55.8 %). Details were shown in Table 4-2.

For the characteristics of participants' husband, the mean age was 21.22 years ($SD = 7.45$), with the age ranged from 14-54 years. About sixty-five percent of them were employee/ laborers and 38.8 % had completed **junior high school**. Details were shown in Table 2.

Tables 2 Demographic characteristics of the participants ($n = 240$).

Participant' s characteristic	<i>n</i>	%
Age (years) ($M = 17.80$, $SD = 1.29$)		
11-14	4	1.7
15-19	236	98.3
Marital status		
Living with spouse with marriage license	19	7.9
Living with spouse without marriage license	167	69.6
Separated	54	22.5
Planned pregnancy		
Yes	106	44.2
No	134	55.8
Education		
Primary school	49	20.4
Lower secondary school	122	50.8
Upper secondary school	47	19.6
Vocational or Diploma	22	9.2
Occupation		
Unemployed	109	45.4
Employee/ Laborers	81	33.8
Student	34	14.2
Merchant	16	6.6
Income (Baht/ month)		
5,000-10,000	50	20.84
10,001-20,000	125	52.08
20,001-30,000	44	18.33
30,001-40,000	11	4.58
> 40,001	10	4.17
Living arrangement		
Mother and family members with spouse	140	58.34
Mother and family members without spouse	100	41.66

Tables 3 Demographic characteristics of participants' mother ($n = 240$).

Characteristic of the participant's mother	<i>n</i>	%
Age (years) ($M = 44.96$, $SD = 6.28$)		
36-40	66	27.5
41-50	130	54.2
51-60	42	17.5
> 60	2	0.8
Occupation		
Employee/ Laborers	110	45.8
Merchant	55	22.9
Unemployed	37	15.4
Agriculturist	25	10.4
Own business	5	2.1
Government officer	5	2.1
Private company employee	3	1.3
Education		
No formal education	17	7.1
Primary school	134	55.8
Lower secondary school	55	22.9
Upper secondary school	26	10.8
Vocational or Diploma	5	2.1
Bachelors or higher	3	1.3

Tables 4 Demographic characteristics of participants' husband ($n = 240$).

Characteristic of the participant's husband	<i>n</i>	%
Age (years) ($M = 21.22$, $SD = 7.45$)		
Unidentified	18	7.5
14-20	70	29.2
21-30	141	58.7
31-40	11	4.6
Occupation		
Employee/ Laborers	156	65.0
Unidentified	20	8.3
Merchant	18	7.5
Own business	10	4.2
Agriculturist	9	3.8
Unemployed	9	3.8
Government official	7	2.8
Private company employee	6	2.5
Student	5	2.1
Education		
Unidentified	20	8.3
No formal education	3	1.3
Primary school	41	17.1
Lower secondary school	93	38.8
Upper secondary school	44	18.3
Vocational or Diploma	37	15.4
Bachelors or higher	2	0.8

Part 2: Assumption testing for the structural equation model [SEM]

Data management was performed for all variables in the model. The general assumption testing of multivariate analysis as SEM included outlier, normality of distribution, linearity, and multicollinearity (Schumacker & Lomax, 2010; Tabachnick & Fidell, 2007). These assumptions must meet for determining the appropriate statistics to utilize, reduce the potential distortion and bias in the results, and facilitate an estimation process or results interpretation (Hair, Black, Babin, & Anderson, 2010; Schumacker & Lomax, 2010; Tabachnick & Fidell, 2007). Details of these testing were described as follows:

Prior to test all the assumptions, missing data were first checked. A total sample in this study was originally 240. However, the results showed that there were no missing data. Subsequently, a total of 240 was then use to perform the assumption testing and further statistical analyses.

A univariate outlier was examined for each variable to confirm free of data outlier and tested by using standardized scored. The univariate outlier was a case with an extreme value or large standardized score on one or more variables which standardized score more or less than 3.29 standard deviation (Tabachnick & Fidell, 2007). The results showed that there was no outlier (in Appendix, Table D-1). A multivariate outlier was also assessed by using Mahalanobis distance, which indicates the distance of a case from the centroid of the means of all variables. It can be evaluated by using the X^2 distribution. A case of $X^2 \leq .001$ had reported as a multivariate outlier (Tabachnick & Fidell, 2007). Consequently, the test results showed that multivariate outlier was not found (in Appendix, Table D-2).

Next, all variables in the model were tested their normal distribution by examining the statistics and using graphical methods (Blunch, 2013; Hair et al., 2010; Tabachnick & Fidell, 2007). For multivariate analysis, all variables must have a normal distribution. Skewness and kurtosis are used to indicate a univariate normality. The normality assumption of skewness and kurtosis for these variables were between +1.96 (Tabachnick & Fidell, 2007). Lei and Lomax (2005) stated that generally the values between -2.0 to 3.5 are acceptable for the research. The results showed that only three variables met the criteria of multivariate normality including attachment (skewness $-0.446/0.157 = -2.84$; kurtosis $-0.453/0.313 = -1.44$), family functioning

(skewness $-0.513/0.157 = -3.26$; kurtosis $-0.192/0.313 = -0.61$), and social support (skewness $0.105/0.157 = 0.66$; kurtosis $-0.584/0.313 = -1.86$). However, the other three variables including grandmother involvement (skewness $-0.599/0.157 = -3.81$; kurtosis $-0.201/0.313 = -0.64$), adolescent parenting stress (skewness $-0.598/0.157 = -3.80$; kurtosis $-0.358/0.313 = -1.14$), and partner relationship (skewness $-0.658/0.157 = -4.19$; kurtosis $-0.251/0.313 = -0.80$) did not meet the criteria of normality distribution. The results indicated that the normality assumption of this study had somewhat violated.

However, for AMOS program, bootstrapping method is an option for analysis of continuous variables which failed to meet the assumption of normality (Kline, 2011). This method is a resampling technique that generates pseudo-multiple samples. Consequently, the following hypothesized model was assessed the model of all variables by using the bootstrap method.

Linearity assumption was assessed by using Pearson correlation coefficient (Schumacker & Lomax, 2010; Tabachnick & Fidell, 2007). The relationships between continuous independent variables were assessed. Evidence of linearity between pairs of variables was found.

Finally, multicollinearity assumption was tested by using three indicators including Pearson correlation coefficients between variables, tolerance value, and variance inflation factor [VIF]. Multicollinearity is highly correlated among independent variables ($r \geq .90$). The tolerance value should be less than 0.20 ($< .2$) and variance inflation factor [VIF] should be less than 10 (< 10) (Blunch, 2013; Hair et al., 2010, Tabachnick & Fidell, 2007). Multicollinearity among the predictor variables was not found.

Part 3: Descriptive statistics of the study variables

There were six major variables including attachment, family functioning, grandmother childcare involvement, parenting stress, social support, and partner relationship. Descriptive statistics of major study variables was described below.

Attachment

The result shown that the total score of attachment between adolescent mother and grandmother ranged from 55-109 ($M = 89.78$, $SD = 12.54$). The attachment consisted of three subscales of trust, communication, and alienation. The score of trust ranged from 17-40 ($M = 33.65$, $SD = 5.03$). The score of communication and alienation ranged from 16-40 ($M = 32.15$, $SD = 5.29$), from 10-30 ($M = 23.97$, $SD = 4.76$), respectively. Details were presented in Table 5.

Tables 5 Descriptive statistics of attachment and its subscales ($n = 240$).

Attachment	Possible range	Actual range	<i>M</i>	<i>SD</i>
Total	22-110	55-109	89.78	12.54
Trust	8-40	17-40	33.65	5.03
Communication	8-40	16-40	32.15	5.29
Alienation	6-30	10-30	23.97	4.76

Family functioning

The result shown that the total score of family functioning ranged from 54-119 ($M = 95.02$, $SD = 12.63$). It consisted of seven subscales including problem solving, communication, roles, affective responsiveness, affective involvement, behavior control, and general functioning. Firstly, the score of problem solving ranged from 8-20 ($M = 16.24$, $SD = 2.80$). The score of communication ranged from 5-21 ($M = 12.79$, $SD = 2.32$). Affective responsiveness had the score ranged from 3-12 ($M = 9.80$, $SD = 1.92$). The score of affective involvement ranged from 3-12 ($M = 15.11$, $SD = 3.07$). The score of roles ranged from 3-12 ($M = 10.40$, $SD = 1.58$). Behavior control had the score ranged from 5-16 ($M = 10.21$, $SD = 2.04$). Lastly, the score of general functioning ranged from 8-28 ($M = 23.36$, $SD = 3.89$). All data were presented in Table 6.

Tables 6 Descriptive statistics of family functioning and its subscales ($n = 240$).

Family functioning	Possible range	Actual range	<i>M</i>	<i>SD</i>
Total	30-120	54-119	95.02	12.63
Problem solving	5-20	8-20	16.24	2.80
Communication	4-16	5-21	12.79	2.32
Roles	3-12	3-12	10.40	1.58
Affective- responsiveness	3-12	3-12	9.80	1.92
Affective - involvement	5-20	3-12	15.11	3.07
Behavior control	3-12	3-12	7.36	1.96
General functioning	7-28	8-28	23.36	3.89

Grandmother childcare involvement

Grandmother childcare involvement consisted of 3 items. The total score of grandmother childcare involvement ranged from 6-13 ($M = 10.89$, $SD = 1.69$).

The data were shown in Table 7.

Tables 7 Descriptive statistics of grandmother childcare involvement ($n = 240$).

Grandmother childcare involvement	Possible range	Actual range	<i>M</i>	<i>SD</i>
Total	3-13	6-13	10.89	1.69

Parenting stress

The result reported that the total score of parenting stress ranged from 16-60 ($M = 33.35$, $SD = 10.03$). It consisted of two subscales of parental stress subscale and lack of parental satisfaction. The score of parental stress subscale ranged from 9-43 ($M = 23.82$, $SD = 7.88$). Lack of parental satisfaction subscale had the score ranged from 7-26 ($M = 9.52$, $SD = 3.58$). All data were presented in Table 8.

Tables 8 Descriptive statistics of parenting stress and its subscales ($n = 240$).

Parenting stress	Possible range	Actual range	<i>M</i>	<i>SD</i>
Total	16-80	16-60	33.35	10.03
Parenting stress	9-45	9-43	23.82	7.88
Lack of parental satisfaction	7-35	7-26	9.52	3.58

Social support

The result explained that the total score of social support ranged from 90-165 ($M = 126.51$, $SD = 15.50$). Four subscales of social support included material support, emotion support, information support, and comparison support. The score of material support subscale ranged from 13-45 ($M = 32.00$, $SD = 6.85$). Emotion support subscale and information support subscale had the score ranged from 15-45 ($M = 33.09$, $SD = 6.06$), ranged from 27-50 ($M = 40.97$, $SD = 5.77$), respectively. The score of comparison support subscale ranged from 10-25 ($M = 20.42$, $SD = 3.48$). All data were presented in Table 9.

Tables 9 Descriptive statistics of social support and its subscales ($n = 240$).

Social support	Possible range	Actual range	<i>M</i>	<i>SD</i>
Total	33-165	90-165	126.51	15.50
Material	9-45	13-45	32.00	6.85
Emotion	9-45	15-45	33.09	6.06
Information	10-50	27-50	40.97	5.77
Comparison	5-25	10-25	20.42	3.48

Partner relationship

Partner relationship consisted of 9 items. The total score of partner relationship ranged from 13-45 ($M = 33.18$, $SD = 8.47$). The data were shown in Table 10.

Tables 10 Descriptive statistics of partner relationship ($n = 240$).

Partner Relationship	Possible range	Actual range	<i>M</i>	<i>SD</i>
Total	9-45	13-45	33.18	8.47

Part 4: Hypothesized model and research hypotheses testing

Structural equation modeling

SEM is a very powerful multivariate analysis technique that combines factor analysis and multiple regression analysis. It is used to analyze structural relationships. The goal of this analysis is to determine the extent to which the theoretical model is supported by sample data. Especially, basic model in SEM compose of regression, confirmatory factor, and path analyses. The estimated parameter and analysis of the model in SEM include evaluation of model fit, interpretation the parameter estimates, and consideration for equivalent or near-equivalent models (Schumacker & Lomax, 2010).

For SEM analysis by AMOS program, there are two types of assessment including measurement model assessment and structural model assessment (Schumacker & Lomax, 2010).

The measurement model assessment

The measurement model is the implicit or explicit model that relates to the latent variable and its indicators that specifies the rules of correspondence between measured and latent variables (Hair et al., 2010).

The assessment of measurement model is the first step in SEM analysis. It is conducted to assess correlation between the constructs similarly to examine for construct validity of the measurement (Hair et al., 2010; Schumacker & Lomax, 2010). Further, the main criteria for measurement model assessment includes validity and reliability of the measures (Ramayah, Lee, & In, 2011). The measurement model is evaluated by using confirmatory factor analysis [CFA].

In this study, the constructs in the model included attachment, family functioning, grandmother childcare involvement, parenting stress, social support, and partner relationship. CFA was used to assess their measurement model. The chi-square (χ^2) was the statistical value that used to assess the fit of the measurement models.

In order to assess the descriptive fit of models, six indices were used to measure the model fit. There was the minimum chi-square value [CMIN], CMIN/degrees of freedom [*df*], the goodness of fit index [GFI], comparative fit index [CFI], adjusted goodness of fit index [AGFI], and root square error of approximation [RMSEA] (Schumacker & Lomax, 2010; Hair et al., 2010; Kline, 2011). The criteria for indices of goodness of fit were a non-significant value of χ^2 ($p > 0.05$), values ranging from less than 2.0 for CMIN/degrees of freedom [*df*], values below 0.05 for RMSEA, and values exceeding 0.95 for CFI, GFI, and AGFI (Hair et al., 2010; Schumacker & Lomax, 2010; Tabachnick & Fidell, 2007). Moreover, factor loadings between construct and each indicator were concerned, which standardized factor loadings were accepted. Firstly, *t* value more than 1.96 indicates a significance level of 0.05 ($p < 0.05$). Secondly, *t* value more than 2.58 indicates a significant level of 0.01

($p < 0.01$). Finally, t value more than 3.29 indicates a significant level of 0.001 ($p < 0.001$) (Hair et al., 2010).

Four measurement models of attachment, family functioning, parenting stress, and social support were analyzed. The others, grandmother childcare involvement and partner relationship, were not analyzed because this model had one indicator. Details were described below.

Attachment

Attachment had three indicators that compose of trust, communication, and alienation subscale. The model of attachment had a construct validity and fit to the empirical data at $\chi^2 = 0.000$, $p = 1.000$, $df = 1$, $CMIN/df = .000$. Three factor loadings were statistical significance at $p < .001$, and the value of standard factor loading from 0.47 to 0.89. Trust had maximum value of standard factor as .89, and alienation had minimum value of standard factor loading as 0.47. All indicators of attachment had positive values of standard factor loading and greater than .30 which indicated acceptable levels (Kim & Whitely, 1978). Therefore, three indicators were indicators of attachment. (Figure 4)

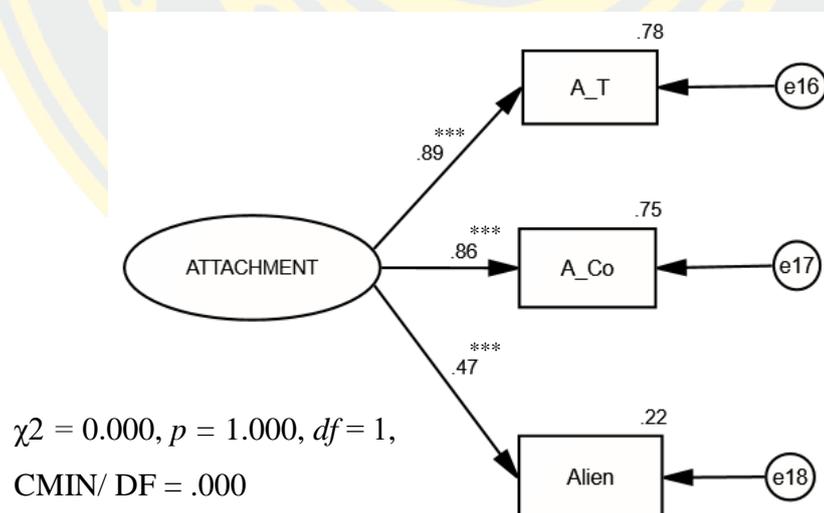
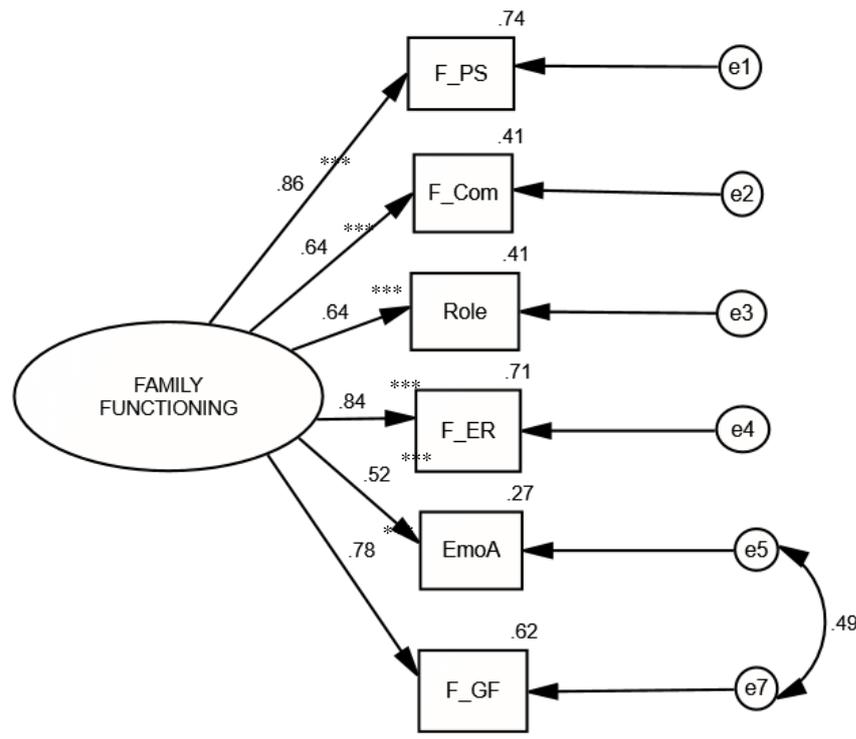


Figure 4 Standardized factor loading and measurement errors for the measurement model of attachment

Family functioning

Family functioning had seven indicators that compose of problem solving, communication, roles, affective responsiveness, affective involvement, behavior control, and general functioning subscale. The model of family functioning had not a construct validity and not fit to empirical data ($\chi^2 = 85.040$, $df = 14$, $p = 0.000$, $CMIN/df = 6.074$, $GFI = 0.898$, $RMR = 0.61523$, $CFI = .901$, $RMSEA = 0.146$). First, six factor loadings were statistically significant at $p < .001$, the value of standard factor loading from 0.60 to 0.84. Problem solving had maximum value of standard factor loading as 0.84 and affective involvement had minimum value of standard factor loading as .60. Six of those indicators had positive values of standard factor loading and greater than .30 that indicated acceptable levels (Kim & Whitely, 1978). Therefore, six indicators were indicators of family functioning. However, behavior control component was not statistically significant at $p < 0.05$, and the value of this standard factor loading was 0.07. Secondly, the confirmatory factor analysis of family functioning shown that the component of behavior control was not significant. Therefore, the behavior control component was reduced from the model and the measurement model was modified until achieving the criteria for model goodness of fit ($\chi^2 = 10.916$, $df = 8$, $p = 0.207$, $CMIN/df = 1.364$, $GFI = 0.986$, $RMR = 0.134$, $CFI = .996$, $RMSEA = 0.039$). From the modified measurement model, the maximum value of standard factor loading was also problem solving as 0.86 and the minimum value of standard factor loading was also affective involvement as .52. (Figure 5)

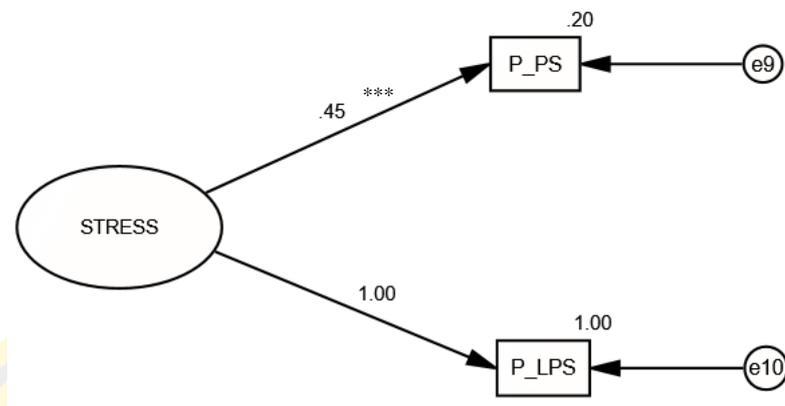


$\chi^2 = 10.916$, $df = 8$, $p = 0.207$, $CMIN/df = 1.364$, $GFI = 0.986$, $RMR = 0.134$,
 $CFI = .996$, $RMSEA = 0.039$

Figure 5 Standardized factor loading and modified of measurement model of family functioning

Parenting stress

Parenting stress had two indicators that compose of parental stress and lack of parental satisfaction subscale. The model of parenting stress had a construct validity and fit to the empirical data at $\chi^2 = 0.000$, $p = 1.000$, $df = 1$, $CMIN/df = .000$. Two factors loading were statistical significance at $p < .001$, the value of standard factor loading as 0.45. Parenting stress had maximum values of standard factor as 0.45. All indicators of parenting stress had positive values of standard factor loading and greater than .30 that indicated acceptable levels (Kim & Whitely, 1978). Therefore, two indicators were indicators of parenting stress. (Figure 6)



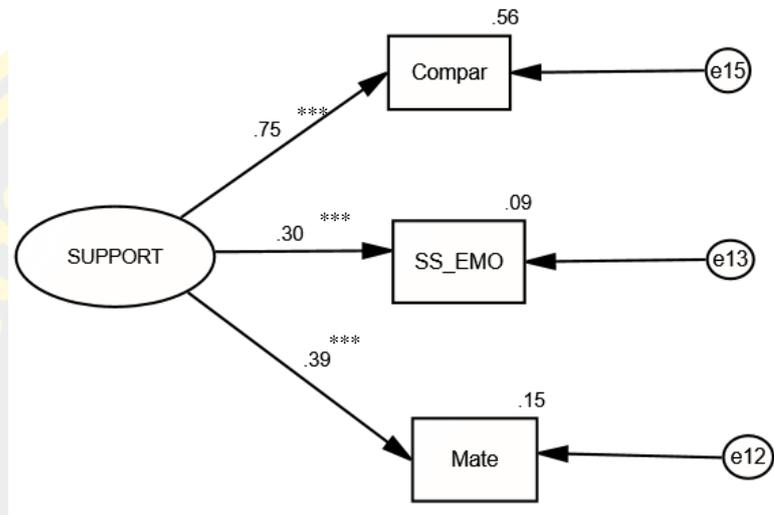
$$\chi^2 = 0.000, p = 1.000, df = 1, \text{CMIN/DF} = .000$$

Figure 6 Standardized factor loading and measurement errors for the measurement model of parenting stress

Social support

Social support had four indicators that compose of comparison, informational, emotional, and material support. The model of social support had not a construct validity and not fit to empirical data ($\chi^2 = 9.068, df = 2, p = 0.011, \text{CMIN/df} = 4.534, \text{RMSEA} = 0.122$). First, two factor loading was statistical significance at $p < .001$, the value of standard factor loading from 0.54 to 0.60. Comparison support had maximum values of standard factor as 0.60 and material support had minimum values of standard factor loading as 0.54. Two of those indicators had positive values of standard factor loading and greater than .30 that indicated acceptable levels (Kim & Whitely, 1978). Therefore, two indicators were indicators of social support. However, emotional support component was not statistical significance at $p < 0.05$ and informational support had the value of this standard factor loading greater than 1.00. Second, the confirmatory factor analysis of social support shown that the component of both informational and emotional support was not significance, when considering the context of adolescent mothers this emotional support played the important role in this concept. Therefore, the researcher reduced the informational support component from the model and the measurement model was modified until achieving the criteria for model goodness of fit ($\chi^2 = .000,$

$df = 1, p = 1.000, CMIN/ df = 0.000, GFI = 1.000, RMR = 0.000, CFI = .1.000, RMSEA = 0.000$). From the modified measurement model, comparison support had maximum values of standard factor as 0.75 and emotional support had minimum values of standard factor loading as 0.30. (Figure 7)



$\chi^2 = 0.000, df = 1, p = 1.000, CMIN/ df = 0.000, GFI = 1.000, RMR = 0.000, CFI = 1.000, RMSEA = 0.000$

Figure 7 Standardized factor loading and modified of measurement model of social support

The hypothesized model

The analysis of moment structure [AMOS] program was used to test the model. The AMOS was statistical software to analyze a moment structures that specially used for structural equation modeling, path analysis, and confirmatory factor analysis (Hair et al., 2010; Kline, 2011). In AMOS, the researchers can draw models graphically using simple drawing tools to represent the relationships among a set of predictor variables (Blunch, 2013; Kline, 2011). Therefore, the AMOS program was used to test how well the hypothesized model fit with the sample data.

Model fit indices

As the model in SEM, assessment of the goodness-of-fit is the model fit-indices that provided by the AMOS. The most common of the approximate fit indices in SEM includes several indicators. There are χ^2 and χ^2/v ratio, standardized root mean square residual [SRMR] index, root mean square error of approximation [RMSEA] index, Tucker-Lewis index [TLI], comparative fit index [CFI] (Hair et al., 2010; Tabachnick & Fidell, 2007). However, the major indices in this study compose of the minimum chi-square value [CMIN], CMIN/ degrees of freedom [*df*], the goodness-of-fit Index [GFI], adjusted goodness of fit index [AGFI], comparative fit index [CFI], and root mean square error of approximation [RMSEA] (Hair et al., 2010; Kline, 2011).

Chi-square was the statistically based measure of goodness-of-fit indices for SEM analysis. The acceptance values of goodness-of-fit indices suggest that a minimum chi-square value [CMIN] should be non-significant ($p > .05$) with CMIN/ degrees of freedom [*df*] less than 2.0 (Hair et al., 2010; Tabachnick & Fidell, 2007). In addition, the acceptance value of CMIN/ degrees of freedom [*df*] was varies. The acceptance was less than 2.0 and reasonable fit was less than 5.0 (Hair et al., 2010; Hu & Bentler, 1998; Schumacker & Lomax, 2010; Tabachnick & Fidell, 2007; Wheaton, Muthen, Alwin, & Summers, 1977). In addition, the criteria of a goodness fit model follow by the GFI should be between .90 to 1.00, the AGFI between .90 to 1.00, and the NFI greater than .90 (Bentler & Bonnet, 1980; Hair et al., 2010; Hu & Bentler, 1998). The CFI was two value including the greater than .90 that was accepted for level of model fit (Blunch, 2013; Hooper, Caughlan, & Mullen, 2008) and $\geq .95$ indicated that a good fit model (Hu & Bentler, 1998). Lastly, the RMSEA should be less than .05 indicated that close to fit, 0 indicating perfect fit, .05 to .08 indicating fair; .08 to .10 showing moderate fit, and $> .10$ suggestion poor fit (Blunch, 2013; Hooper et al., 2008; Hu & Bentler, 1998).

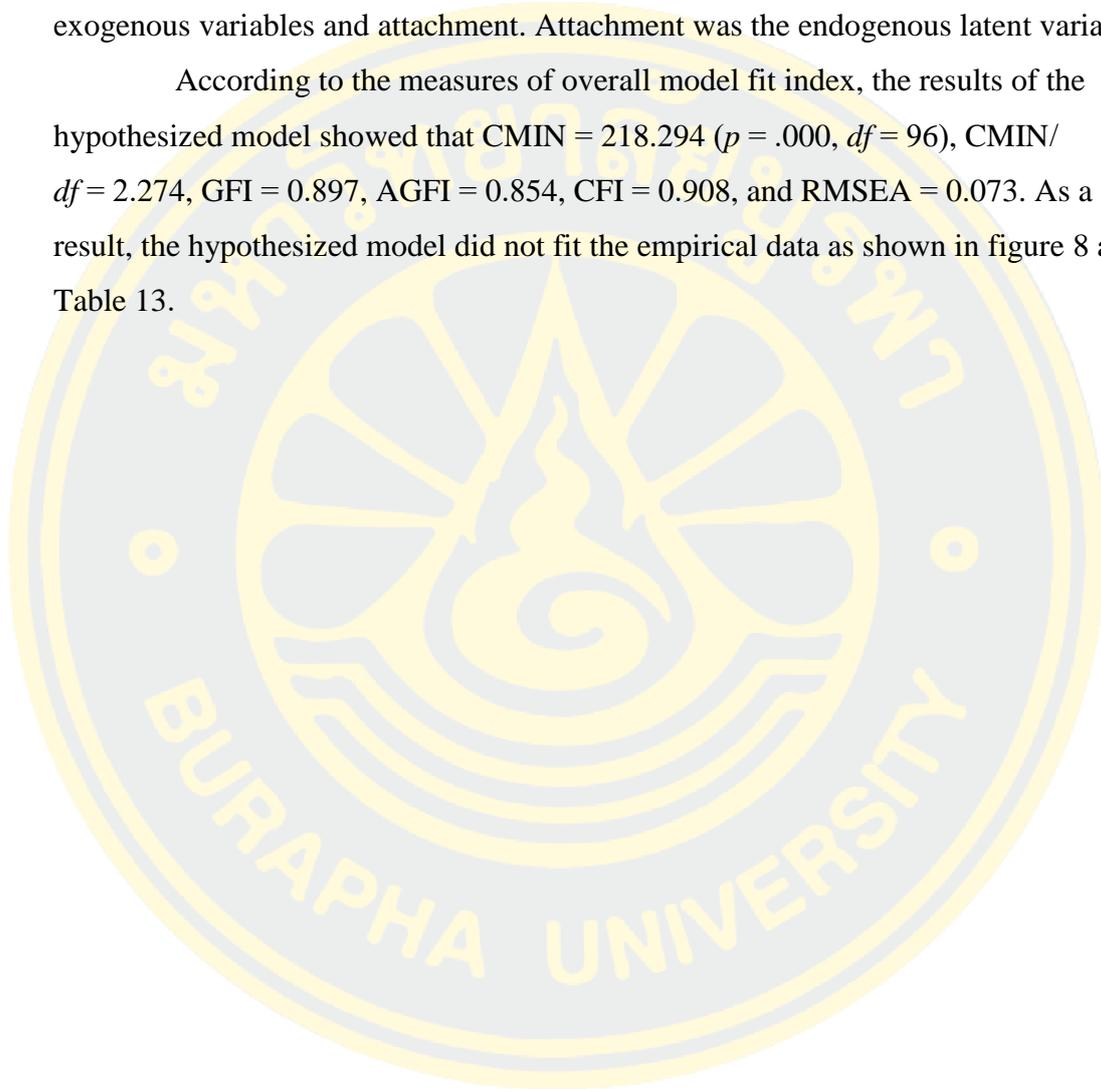
The structural equation model assessment

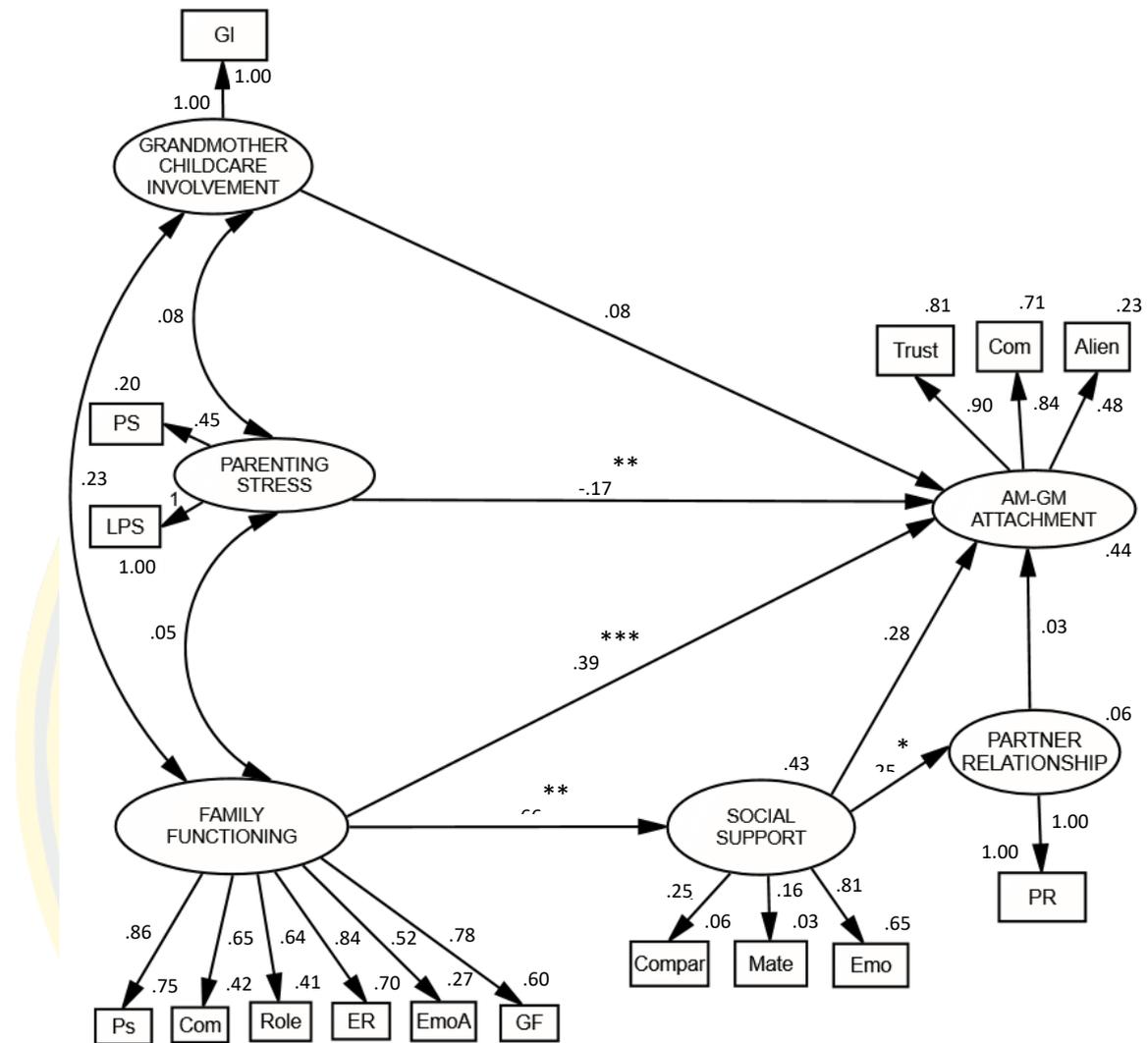
The structural model testing was the second step that should be determined after the measurement model testing. There were two steps including assessing the structural model fit and validating parameter estimates against the research hypotheses.

The hypothesized model testing

The hypothesized model consisted of two exogenous latent variables. There were family functioning and partner relationship. Grandmother childcare involvement, parenting stress, and social support were a mediator between the exogenous variables and attachment. Attachment was the endogenous latent variables.

According to the measures of overall model fit index, the results of the hypothesized model showed that $CMIN = 218.294$ ($p = .000$, $df = 96$), $CMIN/df = 2.274$, $GFI = 0.897$, $AGFI = 0.854$, $CFI = 0.908$, and $RMSEA = 0.073$. As a result, the hypothesized model did not fit the empirical data as shown in figure 8 and Table 13.





$\chi^2 = 218.294, p = .000, df = 96, \chi^2/df = 2.274, GFI = 0.897, AGFI = 0.854, CFI = 0.908, RMSEA = 0.073, ns = \text{non-significant}, *p < .05, **p < .01, ***p < .001$

Figure 8 The hypothesized model of adolescent mother-grandmother attachment

Path analyses of the hypothesized model

The path diagram of the hypothesized causal model of attachment between adolescent mother and grandmother was tested by using parameter estimates and presented in table and figure. The analyzed path diagram of hypothesized model indicated that parameter estimates, and directions were significant at a probability level of less than .05.

For the relationships between exogenous and mediators, the results showed positive significant parameter estimates. The positive direction was a path from family functioning to social support ($\beta = .66, p < .01$), and a path from social support to partner relationship ($\beta = .25, p < .05$).

For the relationships between exogenous and endogenous variables, there were significant relationships of parameter estimates between a path from family functioning to adolescent mother-grandmother attachment ($\beta = .39, p < .001$) and a path from parenting stress to adolescent mother-grandmother attachment ($\beta = -.17, p < .01$). However, the parameter estimates from social support to adolescent mother-grandmother attachment ($\beta = .28, p = .062$), partner relationship to adolescent mother-grandmother attachment ($\beta = .03, p = .660$), and from grandmother childcare involvement to adolescent mother-grandmother attachment ($\beta = .08, p = .187$) were found no significant relationship.

A summary of the direct, indirect, and total effects of the hypothesized model of adolescent mothers-grandmothers attachment is presented in Table 11

Tables 11 Parameter estimates of direct, indirect, and total effects of the hypothesized model ($n = 240$)

Variable	SS			PR			ATT		
	DE	IE	TE	DE	IE	TE	DE	IE	TE
FF	.66**	-	.66**	-	.17*	.17*	.39***	.19	.058
PR	-	-	-	-	-	-	.03	-	.03
PS	-	-	-	-	-	-	-.17**	-	-.17**
INV	-	-	-	-	-	-	.08	-	.08
SS	-	-	-	.25*	-	.25*	.28	.008	.29
	$R^2 = .43$			$R^2 = .06$			$R^2 = .44$		

* = $p < 0.05$, ** = $p < 0.01$, *** = $p < 0.001$

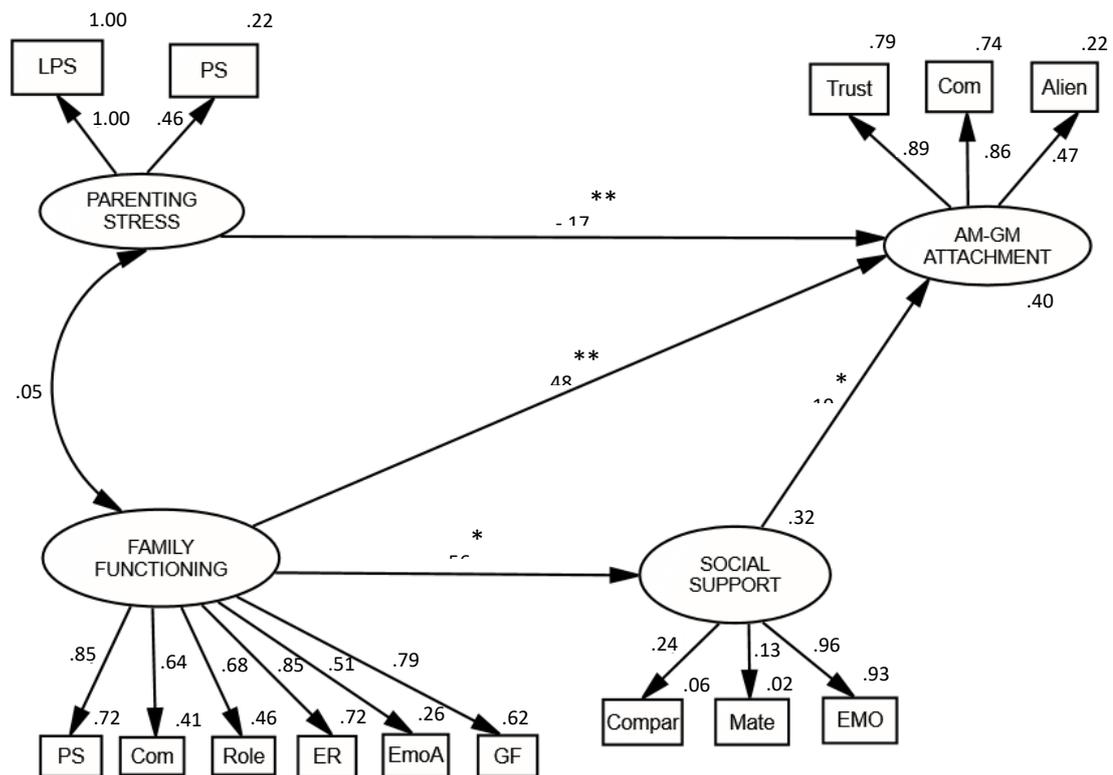
Note: INV = grandmother childcare involvement, SS = social support, PS = parenting stress, ATT = attachment, FF = family functioning, PR = partner relationship : DE = direct effect, IE = indirect effect, TE = total effect

The model modification

Since the hypothesized model did not fit the data from above analysis, the model modification was subsequently carried out. The model modification was the results of analysis that was used to improve the model fit. The model modification included examining the modification indices from the results of analysis, considering recommendation to adjust parameters in the model, and considering the index model from the data analysis (Blunch, 2013; Shumacker & Lomax, 2010). The model trimming was used by deleting only two parameters estimates with non-significant paths in the hypothesized model. These parameters estimates were deleted one at a time.

Paths were deleted before the model was modified including a path from grandmother childcare involvement to adolescent mother-grandmother attachment ($p = .187$), a path from social support to partner relationship ($p < .05$), and a path from partner relationship to adolescent mother-grandmother attachment ($p = .660$). Consequently, the hypothesized model was modified by modification indices until achieving the criteria for model goodness of fit (Kline, 2011).

Finally, the modified model was tested until the model accomplished significantly goodness-of-fit coefficients and specified parameters as shown in Figure 4-6. The overall model fit indexes from the modified model indicated that $CMIN = 76.895$ ($p = .070$, $df = 60$), $CMIN/df = 1.282$, $GFI = 0.956$, $AGFI = 0.923$, $CFI = 0.987$, and $RMSEA = .034$. Therefore, the modified model had a validation index of adequacy of the model at acceptable levels.



$\chi^2 = 76.895$, $p = .070$, $df = 60$, $\chi^2/df = 1.282$, $GFI = 0.956$, $AGFI = 0.923$, $CFI = 0.987$, $RMSEA = .034$

Figure 9 The modified model of adolescent mother-grandmother attachment

The path analysis of modified model

For the modified model, the exogenous variables included family functioning and partner relationship. The mediators were grandmother childcare involvement, social support, and parenting stress. The endogenous variable was adolescent mothers-grandmothers attachment. The relationships among all variables were as follows.

A path from parenting stress, family functioning, and social support had a direct effect on attachment ($\beta = -0.17$, $p < .01$; $\beta = 0.48$, $p < .001$; $\beta = 0.19$, $p < .05$, respectively). Moreover, family functioning had a direct effect on social support ($\beta = 0.56$, $p < .05$), and family functioning also had an indirect effect on this attachment through social support ($\beta = 0.11$, $p < .05$).

The significant directions were a path from family functioning to attachment, a path from parenting stress to attachment, a path from social support to attachment, and a path from family functioning to social support. (Figure 9).

Finally, family functioning, parenting stress, and social support were explained 40 % of the variance of attachment ($R^2 = .40$).

A summary of the direct, indirect, and total effects of modified model of adolescent mothers-grandmothers attachment is presented in Table 12.

Tables 12 Parameter estimates of direct, indirect, and total effects of modified model ($n = 240$)

Variable	SS			ATT		
	DE	IE	TE	DE	IE	TE
FF	.56*	-	.56*	.48***	.11*	.59***
PS	-	-	-	-.17**	-	-.17**
SS	-	-	-	.19*	-	.19*
$R^2 = .32$			$R^2 = .40$			

* = $p < 0.05$, ** = $p < 0.01$, *** = $p < 0.001$

Note: SS = social support, ATT = attachment, FF = family functioning, PS = parenting Stress

: DE = direct effect, IE = indirect effect, TE = total effect

The summary of study results

The hypothesized model was modified by using modification indices. The modification model was a final model that had a better fit to the empirical data than the hypothesized model. A comparison of indicators between the hypothesized and modified model was presented in Table 4-12.

Tables 13 Statistics of model fit index between the hypothesized model and the modified model ($n = 240$)

Model fit criterion	Acceptable score	Hypothesized model	Modified model
CMIN	$p > .05$	$X^2 = 218.294,$ $p = .000$ (df = 96)	$X^2 = 76.895,$ $p = .070$ (df = 60)
CMIN/ <i>df</i>	< 2	2.274	1.282
AGFI	0.95-1.00 = fit	0.854	0.923
GFI	0.95-1.00 = fit	0.897	0.956
CFI	0.97-1.00 = fit	0.908	0.987
RMSEA	$< 0.05 = \text{fit}$	0.07	0.03

The study findings in responding to research hypotheses

In this study, six hypotheses were tested as follows:

Hypothesis 1: Family functioning has a direct positive effect on adolescent mother-grandmother attachment, and has indirect effects on adolescent mother-grandmother attachment through social support and partner relationship.

The path coefficient between family functioning and attachment was significant in the hypothesized model ($\beta = .39, p < .001$) and the modified model ($\beta = .48, p < .001$). The direct effect of family functioning on social support was significant ($\beta = .56, p < .05$). The indirect effect of family functioning on attachment through social support was significant ($\beta = .11, p < .05$). But the indirect effect of family functioning on attachment through partner relationship was not significant because the path coefficient between partner relationship and attachment were deleted in the modified model. Therefore, the results partially supported this hypothesis.

Hypothesis 2: Grandmother childcare involvement has a direct positive effect on adolescent mother-grandmother attachment.

The path coefficient between grandmother childcare involvement and attachment was not significant in the hypothesized model ($\beta = .08, p = .187$), and

were deleted in the modified model. Therefore, the study findings did not support this hypothesis.

Hypothesis 3: Social support has a direct positive effect on adolescent mother-grandmother attachment, and has an indirect effect on adolescent mother-grandmother attachment through partner relationship.

The path coefficient between social support and attachment was not significant in the hypothesized model ($\beta = .28, p = .062$), but this path was significant in the modified model ($\beta = .19, p < .05$). The indirect effect of social support on attachment through partner relationship was not significant because the path coefficient between partner relationship and attachment were deleted in the modified model. Therefore, the study findings partially supported this hypothesis.

Hypothesis 4: Adolescent parenting stress has a direct negative effect on adolescent mother-grandmother attachment.

The path coefficient between adolescent parenting stress and attachment was significant in the hypothesized model ($\beta = -.17, p < .01$) and the modified model ($\beta = -.17, p < .01$). Therefore, the results were supported this hypothesis.

Hypothesis 5: Partner relationship has a direct positive effect on adolescent mother-grandmother attachment.

The direct positive effect of partner relationship on attachment was not statistically significant in the hypothesized model ($\beta = .03, p = .660$), and in the modified model this path was deleted. Therefore, the study findings did not support this hypothesis.

Hypothesis 6: Family functioning, adolescent parenting stress, grandmother childcare involvement, social support, and partner relationship influence adolescent mother-grandmother attachment.

The results shown that family functioning had a direct effect on attachment ($\beta = .48, p < .001$), and had an indirect effect on attachment through social support ($\beta = .11, p < .05$). Therefore, family functioning had a total direct and indirect effect on attachment ($\beta = .59, p < .001$). The study findings showed that the only one variable of family functioning influence attachment through social support. Moreover, parenting stress had a direct negative effect on attachment ($\beta = -.17, p < .01$). Finally, family functioning, parenting stress, and social support influence attachment and

explained 40 % of the variance of attachment ($R^2 = .40$). In summary, this hypothesis was supported.

Summary

This model was analyzed the causal relationship between exogenous variables as family functioning, parenting stress, grandmother childcare involvement, social support, partner relationship, and endogenous variable as attachment. The finding from descriptive statistics shown the characteristics of adolescent mother, adolescent mother's mother, adolescent mother's husband. Descriptive of six major variables as family functioning, grandmother childcare involvement, parenting stress, social support, partner relationship, and attachment were indicated. The assumption testing by outlier, linearity, and multicollinearity of all variables were tested in the preliminary analyses and found acceptable regarding the assumptions for the multiple regression statistics used. While multivariate normality was higher than the absolute value. Then a bootstrap method was performed. Results revealed the hypothesized model did not fit the empirical data. Therefore, the modification of model was done until the goodness of fit indices was in a goodness of fit level. In the final modification mode, the result demonstrated model fit the empirical data ($\chi^2 = 76.895$, $p = .070$, $df = 60$, $\chi^2/df = 1.282$, GFI = 0.956, AGFI = 0.923, CFI = 0.987, RMSEA = .034).

CHAPTER 5

CONCLUSION AND DISCUSSION

This chapter includes three parts. First, a summary of the study are presented. Second, discussion of the research findings related to the research hypotheses and the results of the final model are described. Lastly, limitation, implication, and recommendations are presented.

Summary of the study

The purpose of this study was to test a causal model of adolescent mother-grandmother attachment. The direct and indirect relationship between all predictors and the attachment were tested. There were 5 predictors including family functioning, grandmother childcare involvement, parenting stress, social support, and partner relationship. A multi-stage random sampling technique was used to recruit a sample of 240 adolescent mothers who met the inclusion criteria. Research instruments consisted of 7 questionnaires, including a demographic questionnaire, the IPPA-Thai version, the CFI, the maternal grandmother involvement-Thai version, the PSS-Thai version, the PSQ-Thai version, and the RQ score-Thai version. Their reliability of Cronbach's alpha coefficients were 0.85, 0.85, 0.82, 0.80, 0.93, and 0.94, respectively.

The participants' mean age was 17.80 ($SD = 1.29$) years. More than half of them had unplanned pregnancy, completed junior high school, unemployed, and living with mother and family members with spouse. The mothers of participants had their mean age of 44.96 ($SD = 6.28$) years. Nearly half (45.8 %) of them were employment and had completed primary school (55.8 %). The participants' husband had mean age of 21.22 ($SD = 7.45$) years. Most of them (65.0 %) were employment and 38.8 % had completed junior high school.

The hypothesized model did not fit the empirical data. Modification the model was then conducted until the final model reached the goodness-of-fit criterion using the bootstrap method.

The final modified model showed the direct and indirect effects on adolescent mothers-grandmothers attachment. First, family functioning had a positive direct effect on attachment ($\beta = .48, p < .001$) and had an indirect effect on attachment through social support ($\beta = .11, p < .05$). Parenting stress had a negative direct effect on attachment ($\beta = -.17, p < .01$). Lastly, social support had a positive direct effect on attachment ($\beta = .19, p < .05$). In addition, family functioning had a direct effect on social support ($\beta = .56, p < .05$). Finally, family functioning, social support, and parenting stress were explained 40 % of the variance of attachment ($R^2 = .40$).

Discussion of the findings

The study findings are discussed from the following:

Hypothesis # 1: Family functioning has a direct positive effect on adolescent mother-grandmother attachment, and has indirect effects on adolescent mother-grandmother attachment through social support and partner relationship.

The results showed that a path coefficient between family functioning and attachment was significant ($\beta = .48, p < .001$). Moreover, the indirect effect of family functioning on attachment through social support was significant ($\beta = .11, p < .05$). However, the indirect effect of family functioning on attachment through partner relationship was not significant. Therefore, this hypothesis was partially supported.

From this finding it implies that adolescent mothers who have higher family functioning and received higher grandmother childcare involvement would have higher attachment between themselves and their mothers. It could be explained based on the family functioning and family concepts. The family has important role in the development of cognitive and emotional of each individual, and also play the basic role to determine functions of family member about roles, responsibilities, agreements, supporting in critical situations, creating accurate relationships, maintaining trust and responsibility (Kapanee & Rao, 2007). Adolescent mothers are a member of the family, then they also play these functions with other family members.

The findings of this study indicate that family functioning influence attachment of adolescent mothers and their mothers. It could be explained based on previous study that better family functioning has been found to be associated with

secure or higher level of attachment among family members (Rawatlal et al., 2015). Because the dimension of family functioning such as better problem solving, family cohesion, communication and expressiveness within family might have to provide feeling of togetherness, responsiveness, good interpersonal communication, an increasing interest in relationship to others in family that associated with higher levels of attachment. Conversely, family with poor family functioning as less cohesion, support and communication lead to less attachment (Kullik & Petermann, 2013 ; Miller & Commons, 2010 ; Ronnlund & Karlsson, 2006).

These results are consistent with several findings that has examined the relationship between family functioning and attachment (Kullik & Petermann, 2013 ; Miller & Commons, 2010 ; Ronnlund & Karlsson, 2006). Liu, Shono, and Kitamura (2008) reported that family functioning correlated with adult attachment. In addition, they also found that family adaptability and family cohesion influence attachment relationships.

Rawatlal et al. (2015) conducted a larger collaborative study to examine the relationship between attachment patterns, parental support and family functioning from the adolescent and primary caregiver. They found that the family functioning in dimensions of communication, cohesion and support has an influence on attachment relationships. Fujimori¹ et al., (2017) conducted study about attachment in university students. The findings indicated that family functioning including cohesion and adaptability were positive significantly correlated with secure attachment styles ($r = 0.29, p < 0.01$; $r = 0.29, p < 0.01$, respectively), and negative significantly correlated with less attachment ($r = -0.14, p < 0.05$; $r = -0.16, p < 0.01$, respectively).

Previous studies found that family functioning in dimensions of communication in form of shared information with parents related to stronger attachment with parents, particularly their mothers (Ishak, Yunus, & Iskandar, 2010). Additionally, better family functioning can predict higher self-esteem and stronger attachment quality. It means that adolescent who report better general family functioning, communication and problem solving were more likely to be increased attachment (Wallis et al., 2017).

Likewise, family functioning had the indirect effect on attachment through social support. It may explain that family functioning can enhance social support by

increasing skills such as communication skill for requiring support from support networks especially grandmother. Thus, they could be improved attachment between adolescent mothers and grandmother. This is consistent with findings of Yurdakul (2018) found that the communication and social skills of adolescent mothers could affect on skills for requiring social support or involvement from other people. Besides, poor interpersonal skills as lack of communication skill with family members may reduce their perceived and actual social support from others (Nilsen et al., 2013).

In conclusion, this evidence presented helps to illuminate the family functioning with social support factor that could be predicted attachment between adolescent mothers and grandmothers. Moreover, instrument of this study can assess family functioning in dimensions of communication and expression that is similar to instrument in previous study. Therefore, this research findings can explain the context of attachment among adolescent mothers and grandmothers.

Hypothesis # 2: Grandmother childcare involvement has a direct positive effect on adolescent mother-grandmother attachment.

Base on the hypothesized model, the parameter estimated for grandmother childcare involvement was not statistically significant direct positive on attachment ($\beta = .08, p = .187$) and was deleted in the modified model. This finding based on the estimated parameter between grandmother childcare involvement and attachment was not supported this hypothesis.

The results of this study indicate that grandmother childcare involvement cannot predict adolescent mothers-grandmother attachment. It did not congruent with previous studies. One possible reason might be that adolescent mothers who have extensive grandmother childcare involvement tend to have conflict or relationship strains between themselves and their mothers (Apfel & Seitz, 1991; Grau et al., 2012). Additionally, it is possible that sometime adolescent mothers and their mother have disagreement about parenting style between mothers and grandmothers (Apfel & Seitz, 1991). Therefore, parenting role and emotional expression of adolescent mothers is limited and not directly influences attachment. Finally, childcare involvement from their own mothers may not be explained the attachment between adolescent mothers and grandmothers.

On the other hand, the previous studies revealed that adolescent mothers who received more involvement from their mothers tended to have higher level of attachment among them and their mothers. As a literature, adolescent mothers indicated that they are high risk group condition and tend to have low socio-economic status or problems with their child. Thus, grandmothers play a role to highly involved with their daughters and young grandchildren (Silverstein & Ruiz, 2006; Smith & Drew, 2002). Grandmothers usually provide support, care, response, safety and involvement for their adolescent mothers and grandchildren (Barnett et al., 2010; Chan & Elder, 2009). Particularly, involvement of grandmother was several identified as parental engagement in terms of frequency of didactic care, physical play, and care-giving (Cabrera, Shannon, West, & Brooks-Gunn, (2006), or in terms of intergenerational cohabitation, child rearing, seeing, and helping to raise grandchildren (Cook & Roggman, (2010), or in term of emotional reassurance, advice, financial support and child-care support (Silberman, (2016). Their involvement is a significant viewed as an important source of emotional, financial, instrumental and information support that can buffer adolescent mothers from adverse psychological consequences (Gordon et al., 2004). Because higher level of grandmother involvements related to higher levels of intimacy, responsiveness, security, commitment and trust in their relationships that lead to have more attachment (Barnett et al., 2016; Cook & Roggman, 2010; van Schaick & Stolberg, 2001).

Moreover, this finding did not congruent with the previous studies that shown grandmother involvement influencing on attachment relationships (Cook & Roggman, 2010). It is inconsistent with the several findings that examined the relationship between grandmother involvement and attachment (Bates et al., 1985; Crockenberg, 1981; van Schaick & Stolberg, 2001). They indicate that involvement from mothers is significant predictors of increased attachment while a lower level of involvement is related to less attachment.

In summary, this evidence reviewed that the grandmother childcare involvement could not predict attachment between adolescent mothers and grandmothers.

However, instrument of this study can measure grandmother involvement in dimensions of intergenerational cohabitation, child rearing, and seeing their

grandchildren that is similar to instrument in previous study. Thus, these results can describe the context of attachment among adolescent mothers and grandmothers.

Hypothesis # 3: Social support has a direct positive effect on adolescent mother-grandmother attachment, and has an indirect effect on adolescent mother-grandmother attachment through partner relationship.

From the hypothesized model, the direct positive effect of social support on adolescent mother-grandmother attachment was not statistically significant ($\beta = .28$, $p = .062$), but this path was significant in the modified model ($\beta = .19$, $p < .05$). However, the indirect effect of social support on attachment through partner relationship was not significant and the path coefficient between partner relationship and attachment ($\beta = .03$, $p = .660$) was deleted from the modified model. Therefore, this research finding based on the estimated parameter between social support, partner relationship, and attachment was partially supported the hypothesis.

Social support influences attachment by increasing feeling of security, life satisfaction, capacity to seek a problem solving and caring from attached figures (Green et al., 2011 ; Moller et al., 2003; Shahyad et al., 2011). Generally, mothers and partners of adolescent mothers are the most primary social resources and are identified as an important source of support (Gee & Rhodes, 2007; Laghi et al., 2013; Oldehinkel et al., 2011). Especially, mothers of adolescent mothers have been identified as the closest and most consistent support figure who provide emotional, tangible, financial, and childcare support, (Devito, 2010; Laghi et al., 2013).

As a support from grandmother and family members increased, negative or insecure attachment was decreased. As *above mentioned*, increasing positive relationship experiences such as support or companionship are related to increase higher level or security attachment with parents (Ruhl et al., (2008). It is possible that supportiveness from grandmother and family member is consistent with helping child rearing, providing all resources, and encouragement adolescent mothers expressing the need of support help to others Additionally, supportiveness receiving from their relationship is related to attachment because it promotes autonomy for children and adolescents (Rubin et al., 2004).

Moreover, this study results were consistent with the study of Green et al. (2011) that examined relationship between social support and attachment. According to the findings, they suggested that increasing social support and fewer stressful life events tend to have increased level of attachment.

However, social support had not indirect effect on attachment through partner relationship. It is possible that most of adolescent mothers and their partner lived with their own family and feel free in their life. Partner of adolescent mother could not provide more support to adolescent mother because they younger and lack of resource. Thus, the indirect effect of social support on attachment through partner relationship could not be predicted.

In summary, this current study can be summarized that social support may be a strong predictor of attachment among adolescent mothers and grandmothers.

Hypothesis # 4: Adolescent parenting stress has a direct negative effect on adolescent mother-grandmother attachment.

The finding shown that the path coefficient between adolescent parenting stress and attachment was significant in the modified model ($\beta = -.17, p < .01$). The results supported that parenting stress had a direct negative effect on attachment between adolescent mothers and grandmothers. Therefore, this hypothesis was supported. The results interpret that adolescent mothers who had higher level of parenting stress tended to have lower level of attachment between adolescent mothers and grandmothers.

The findings of this study reported that most of adolescent mothers had unplanned pregnancy and had lower level of parenting stress. The exogenous variable of parenting stress can predict attachment between adolescent mothers and grandmother. It could be explained that perceived parenting stress can inhibit secure attachment and activate negative or insecure attachment (Feldman, 2007; Lubiewska & Derbis, 2016; Nakagawa et al., 1992; Riggs & Han, 2009). Transition to the new maternal role and new responsibility in adolescent mothers can cause parenting stress and increasing risk factor for health and social problems. Because the majority of adolescent mothers are younger, single, and have more problems about socio-economic status, lack of social support and increasing vulnerability (Garner et al.,

2013; Mazzeschi et al., 2015). Therefore, mothers who have higher degree of parenting stress are more likely to decrease level of attachment (Green et al., 2011).

This reason is supported by previous studies (Nakagawa et al., (1992). For instance, Nakagawa et al. ((1992) found a negative relationship between level of parenting stress and attachment security. Consistent with the several studies of Lubiewska and Derbis (2016); Jarvis & Creasey, 1991; Rholes, Simpson, & Friedman 2006; Mazzeschi et al., 2015), they reported that parenting stress was associated with less attachment. In the last decades, Jarvis and Creasey (1991) indicated that coping strategy was related to minimize the associations between parenting stress and attachment security. Besides, previous study showed positive correlations between less attachment and parenting stress or emotional problems. (Kim, Kang, & Kwack, 2019; Wambua, Obondo, Bifulco, & Kumar, 2018).

In conclusion, this finding can be summarized that parenting stress are a significant predictor of attachment among adolescent mothers and grandmothers.

Hypothesis # 5: Partner relationship has a direct positive effect on adolescent mother-grandmother attachment.

Based on the modified model, the finding found that a direct positive effect of partner relationship on adolescent mother-grandmother attachment was not statistically significant ($\beta = .03, p = .660$), and in the modified model this path was deleted. Thus, these research findings were not supported the hypothesis.

Although the direct positive effect of partner relationship on attachment was not statistically significant. This present study did not congruent with previous studies. One possible reason might be that adolescent mothers' partner live with the family of adolescent mothers and tend to have adaptability to their new family. They are characterized by younger, lower income, and having less experience for rearing their child that could be depend on adolescent mothers' mothers such as child rearing, or financial support. Therefore, emotional expression in dimension of partner relationship is limited and not directly influences attachment. But the indirect effect through parenting stress was supported.

Inconsistent with the study of (Feeney, 1996) indicated that satisfaction with partner relationships is associated with attachment behavior, and another previous studies found that partner relationship may influence attachment of another relationship

as in the parent-child dyad or adolescent mother-grandmother dyad (Woodhouse et al., 2009). More explanation is that satisfaction with partner relationship can encourage feeling of togetherness, responsibility, trust, and security. Then, adolescent mothers who perceived adequate satisfaction with their partner relationship may have feeling security with their relationship and had greater influence attachment (Cramer, 2003; Shahyad et al., 2011). However, relationships between adolescent mothers and their partners are more likely to have instability and inconsistency. Because their partners are characterized by unstable, transient and conflictual. (Castellanos, 2013; Devito, 2007; Miller, Duncan, Brown, Sparks, & Claud, 2003).

From the current findings can be concluded that partner relationship could not be a significant predictor of attachment between adolescent mothers and grandmothers.

Hypothesis # 6: Family functioning, adolescent parenting stress, grandmother childcare involvement, social support, and partner relationship influence adolescent mother-grandmother attachment.

From modified model, family functioning had a direct effect on attachment ($\beta = .48, p < .001$), and had an indirect effect on attachment through social support ($\beta = .11, p < .05$). Therefore, these results indicated that family functioning had a total direct and indirect effect on attachment ($\beta = .59, p < .001$). Additionally, parenting stress had a direct negative effect on attachment ($\beta = -.17, p < .01$). Therefore, this hypothesis was partially supported. This finding revealed that adolescent mothers who had higher level of family functioning, and social support tend to have higher level of attachment between them and their mothers. Conversely, they who had higher level of parenting stress tend to have lower level of attachment.

According to the adult attachment theory (Ainsworth, 1989; Bowlby, 1969), attachment is viewed as emotional ties between infants and their caregivers that is essential for the survival of vulnerable infants and is elaborated on adult relationship. It begins in the early lives of infants and is then transferred to different relationship partners throughout the life span in adulthood for the fundamental survival system (Ainsworth, 1979; Bowlby, 1969; J. Bowlby, 1973; Dinero et al., 2008; Khodarahimi et al., 2016). Therefore, attachment between adolescent mothers and grandmothers is

described as a bond, intimacy, and emotional tie between a mother and daughter that lasts over the life span and is posited as an adult attachment.

In conclusion, family functioning, parenting stress, and social support influence attachment and explained 40 % of the variance of attachment ($R^2 = .40$). The finding confirms with the previous studies that has determined the relationship between family functioning, parenting stress, social support, and attachment (Green et al., 2011; Karlsson, 2006; Liu et al., (2008); Lubiewska & Derbis, (2016); Miller & Commons, 2010; Rawatlal et al., (2015)van Schaick & Stolberg, 2001).

However, this study findings indicated that only social support was the mediators, which had influence attachment. It could be explained based on this study that adolescent mothers who had greater level of family functioning were more likely to perceive more support from grandmothers, then they could tend to have increasing higher level of attachment.

Finally, the findings provide a context of causal relationship between the significant predictors and attachment among adolescent mothers and grandmothers in Thailand. The finding focused that the significant positive predictor of attachment was not only family functioning, and social support but also the significant negative predictor of parenting stress. Attachment among adolescent mothers and grandmothers could be increase when adolescent mothers had greater level of positive indicators and had fewer level of negative indicators.

Limitation

This present study has some limitations that should be mentioned. First, the participants were recruited from adolescent mothers who had delivery of the first child with aged more than 6 months, and currently living with their mothers for at least 6 months. Generalizability to other groups such as repeated pregnancy or separated family may be limited. Further investigation and modifications are needed. Second, some research instruments need to concern about cultural sensitivity. In addition, some contexts such as personal data, age of baby, and what the adolescent mother do after child birth should be explore.

Implications

1. Implication for nursing practice

This significant finding from the final model can contribute the new knowledge to clarify the influence of significant factors of adolescent mother-grandmother attachment which included family functioning, social support, and parenting stress. Nurse professions and healthcare teams are positioning to improve well-being and attachment of adolescent mothers, their child, and their family by understanding the significant predictor of this attachment. For clinical and community assessment, the screening test of attachment should be recommended. As above predictor findings, nurse professions in clinical and community setting should be considerate and assess signs of poor attachment for identifying adolescent mother who are at risk of poor attachment among adolescent mothers and their mothers. Moreover, nurse professions encourage healthcare teams developing ability for using the effective screening to assess and identified this assessment.

The finding suggests that promoting significant positive factors and decreasing negative factor can improve attachment of adolescent mother and grandmother. Nursing intervention should directly address attachment and can promote attachment among adolescent mother and grandmother and encourage adolescent mothers to properly adapt into maternal and parenting roles. For instance, this nursing intervention should be include the encouragement of family functioning and social support of adolescent mother, and teaching adolescent mothers to manage their parenting stress.

2. Implications for public health policy

Solutions to reduce the severity of adolescent mother problems in Thailand require clear health policies that consist with these problems. The results of this study from the final model can be used to considerate as an evidence-based in determining health policy and solving adolescent mother problems. Because these findings related to characteristics of adolescent mothers and their family in Thai society that shift to aging society and consist of grandmother, adolescent mother and grandchild. Most of the adolescent mothers live with their mother and families that are the important resources for providing support for adolescent mothers and their child. Policy makers should be aware of multidisciplinary teams who work with adolescent mother, especially, nurse professionals who provide the closest caring with adolescent mothers,

their child, their mother and their family. Therefore, this policy including strategies to communicate this attachment in the hospital and community, determining to screen attachment among adolescent mother and grandmother.

Recommendations for future research

This research finding provide a guide for future research as follows.

1. Although the results based on the conceptual framework of attachment. It is important to note that the results could not be generalized to other populations, such as repeated pregnancy or adolescent mother towards mothers and fathers separately. In the future, this study should be replicated in different populations.
2. This finding reported that the model explained about 40 % of attachment. Therefore, further research should add some variables into the model that could have influence such as parenting style. In addition, comparing participants living between urban and rural setting should be concerned.
3. The Inventory of parent and peer attachment (IPPA) was used to measure attachment between adolescent mothers and grandmothers. It was a reliable self-report instrument of adolescent-parent attachment. However, a qualitative aspect of attachment should be addressed. Moreover, firstly, age of the baby and what the adolescent mother do after delivery should be recorded.
4. A longitudinal study should be further conducted in fulfilling understanding of adolescent mothers-grandmothers attachment.

REFERENCES

- Abidin, R. R. (1995). *Parenting Stress Index: Professional manual* Lutz, FL:: Psychological Assessment Resources.
- Adamczyk, K., & Bookwala, J. (2013). Adult attachment and single vs. partnered relationship status in Polish University students. *Psychological Topics, 22*, 481-500.
- Ainsworth, M. D., & Wittig, B. A. (1969). Attachment and exploratory behavior of one-year-olds in a strange situation. In B. M. Foss (Ed.), *Determinants of infant behavior* (Vol. 4, pp. 113-136). London: Methuen.
- Ainsworth, M. D. S. (1967). *Infancy in Uganda: Infant care and the growth of attachment*. Baltimore: Johns Hopkins University Press.
- Ainsworth, M. D. S. (1989). Attachments beyond infancy. *American Psychologist, 44*, 709-716.
- Ainsworth, M. D. S., Blehar, M. C., Waters, E., & Wall, S. (1978). *Patterns of attachment: A psychological study of the strange situation*. Hillsdale, NJ: Erlbaum.
- Ainsworth, M. S. (1979). Infant-mother attachment. *American Psychologist, 34*(10), 932-937. doi: 10.1037/0003-066X.34.10.932
- Ainsworth, M. S. (1989). Attachments beyond Infancy. *American Psychology, 44*, 709-716. doi: 10.1037/0003-066X.44.4.709
- Akgün, E. (2008). *The effects of the "training program in improving mother-child relationship through play" on mothers' interaction levels*. Doctoral dissertation, Guidance and Psychological Counseling, Department of Guidance and Psychological Counseling, Faculty of Educational Sciences, Ankara University.
- Alder, M. C., Yorgason, J. B., Sandberg, J. G., & Davis, S. (2018). Perceptions of parents' marriage predicting marital satisfaction: The moderating role of attachment behaviors *Journal of Couple & Relationship Therapy, 17*(2), 146-164. doi: 10.1080/15332691.2017.1372834

- Allen, J. P., & Land, D. (1999). Attachment in adolescence. In J. Cassidy, & P. R. Shaver (Eds.), *Handbook of attachment: Theory, research and clinical applications* (pp. 319-335). New York: Guilford Press.
- Allen, J. P., Porter, M., McFarland, C., McElhaney, K. B., & Marsh, P. (2007). The relation of attachment security to adolescents' paternal and peer relationships, depression, and externalizing behavior. *Child Development, 78*(4), 1222-1239.
- Angley, M., Divney, A., Magriples, U., & Kershaw, T. (2015). Social support, family functioning and parenting competence in adolescent parents. *Maternal Child Health Journal, 19*(1), 67-73.
- Aparicio, E., Pecukonis, E. V., & O'Neale, S. (2015). The love that I was missing: Exploring the lived experience of motherhood among teen mothers in foster care. *Children and Youth Services Review, 51*, 44-54.
- Apfel, N. H., & Seitz, V. (1991). Four models of adolescent mother-grandmother relationships in black inner-city families. *Family Relations, 40*, 421-429.
- Armsden, G. C., & Greenberg, M. T. (1987). The inventory of parent and peer attachment: Individual differences and their relationship to psychological well-being in adolescence. *Journal of Youth and Adolescence, 16*, 427-454.
- Armsden, G. C., McCauley, E., Greenberg, M. T., Burke, P. M., & Mitchell, J. R. (1990). Parent and peer attachment in early adolescent depression. *Journal of Abnormal Child Psychology, 18*(6), 683-697.
- Barnett, M. A., Mills-Koonce, W. R., Gustafsson, H., Cox, M., Vernon-Feagans, L., Blair, C., Burchinal, P., Burton, L., Crnic, K., Crouter, A., Garrett-Peters, P., Greenberg, M., Lanza, S., Roger Mills-Koonce, W., Skinner, D., Stifter, C., Werner, E., & Willoughby, M. (2012). Mother-grandmother conflict, negative parenting, and young children's social development in multigenerational families. *Family Relations, 61*(5), 864-877. doi: 10.1111/j.1741-3729.2012.00731.x
- Barnett, M. A., Mortensen, J. A., & Gonzalez, H. (2016). Grandmother involvement in Mexican American family: Implications for transborder relationships and maternal psychological distress. *Journal of Family Issues, 37*(14), 1945-1967.

- Barnett, M. A., Scaramella, L. V., Neppl, T. K., Ontai, L. L., & Conger, R. D. (2010). Intergenerational relationship quality, gender and grandparent involvement. *Family Relations, 59*(1), 28-44. doi: 10.1111/j.1741-3729.2009.00584.x
- Bartholomew, K. (1990). Avoidance of intimacy: An attachment perspective. *Journal of Social and Personal Relationships, 7*, 147-178.
- Bartholomew, K., & Horowitz, L. M. (1991). Attachment styles among young adults: A test of a four category model. *Journal of Personality and Social Psychology, 61*, 226-244.
- Bartholomew, K., & Shaver, P. R. (1998). Methods of assessing adult attachment: Do they converge? In J. A. Simpson, & W. S. Rholes (Eds.), *Attachment theory and close relationships* (pp. 25-45). New York: Guilford.
- Bates, J. E., Maslin, C. A., & Frankel, K. A. (1985). Attachment security, mother-child interaction, and temperament as predictors of behavior-problem ratings at age three years. *Monographs of the Society for Research in Child Development, 50*(1-2), 167-193.
- Baumann, A. A., Kuhlberg, J. A., & Zayas, L. H. (2010). Familism, mother-daughter mutuality, and suicide attempts of adolescent Latinas. *Journal of Family Psychology, 24*(5), 616-624. doi: 10.1037/a0020584
- Beavers, R., & Hampson, R. (2000). The Beavers system model of family function. *Journal of Family Therapy, 22*, 128-143.
- Bernardon, S., Babb, K. A., Hakim-Larson, J., & Gragg, M. (2011). Loneliness, attachment, and the perception and use of social support in university students. *Canadian Journal of Behavioural Science, 43*(1), 40-51. doi: 10.1037/a0021199
- Berry, J. O., & Jones, W. H. (1995). The parental stress scale: Initial psychometric evidence. *Journal of Social and Personal Relationships, 12*(3), 463-472.
- Bentler, P. M., & Bonnet, D. C. (1980). Significance tests and goodness of fit in the analysis of covariance structures. *Psychological Bulletin, 88*(3), 588-606.
- Black, A. Y., Fleming, N. A., & Rome, E. S. (2012). Pregnancy in adolescents. *Adolescent medicine: State of The Art Reviews, 23*(1), 123-138.

- Blunch, N. J. (2013). *Introduction to structural equation modeling using IBM SPSS statistics and AMOS*. London: Sage.
- Borcherding, K., SmithBattle, L., & Schneider, J. K. (2005). A preliminary investigation of the grandparent support scale for teenage mothers. *Journal of Family Nursing, 11*, 289-306.
- Bowlby, J. (1969). *Attachment and Loss Vol. 1*. New York: Basic Books.
- Bowlby, J. (1973). *Attachment and loss Vol. 2 Separation: Anxiety and anger*. New York: Basic Books.
- Bowlby, J. (1979). *The making and breaking of affectional bonds*. London: Tavistock.
- Bowlby, J. (1980). *Attachment and loss Vol. 3. Loss*. New York: Basic Books.
- Bowlby, J. (1982 a). *Attachment* (2nd ed.). New York: Basic Books.
- Bowlby, J. (1982 b). Attachment and loss: Retrospect and prospect. *American Journal of Orthopsychiatry, 52*, 664-678.
- Bowlby, J. (1982 c). *Attachment and loss Vol. 1 Attachment*. New York: Basic Books.
- Bowlby, J. (1988). *A secure base*. New York: Basic Books.
- Brennan, K. A., Clark, C. L., & Shaver, P. R. (1998). Self-report measurement of adult romantic attachment: An integrative overview. In J. A. Simpson, & W. S. Rholes (Eds.), *Attachment theory and close relationships* (pp. 46-76). New York: Guilford Press.
- Brislin, R. W., Lonner, W., & Thorndike, R. (1973). *Cross-cultural research methods*. New York: Willy.
- Bretherton, I. (1985). *Attachment theory: Retrospect and prospect*. *Monographs of the Society for Research in Child Development, 50(1-2)*, 3-35.
- Bretherton, I. (1990). Open communication and internal working models: Their role in the development of attachment relationships. In R. A. Thompson (Ed.), *Current theory and research in motivation, Vol. 36. Nebraska Symposium on Motivation, 1988: Socioemotional development* (pp. 57-113). Lincoln: University of Nebraska Press.
- Bureau of Reproductive Health. (2015). *Reproductive health of adolescents and youth situation in 2015*. Retrieved from http://rh.anamai.moph.go.th/ewt_dl_link.php?nid=147

- Bureau of Reproductive Health. (2016). Reproductive health of adolescents and youth situation in 2016. Retrieved from http://rh.anamai.moph.go.th/download/all_file/index/RH@2559.pdf
- Cabrera, N. J., Shannon, J. D., West, J., & Brooks-Gunn, J. (2006). Parental interactions with Latino infants: Variation by country of origin and English proficiency. *Child Development, 77*(5), 1190-1207.
- Calvo, V., & Bianco, F. (2015). Influence of adult attachment insecurities on parenting self-esteem: The mediating role of dyadic adjustment. *Frontiers in Psychology, 6*, 1461. doi: 10.3389/fpsyg.2015.01461
- Cassidy, J. (2000). Adult romantic attachments: A developmental perspective on individual differences. *Review of General Psychology, 4*, 111-131.
- Cassidy, J., & Shaver, P. R. (2008). *Handbook of attachment: Theory, research, and clinical applications* (2nd ed.). New York: Guilford Press.
- Castellanos, P. (2013). *The romantic relationships of Latina adolescent mothers: Longitudinal effects of relationship satisfaction, social support, and relationship strain*. Doctoral dissertation, Psychology, Department of Psychology, College of Arts and Sciences, Kent State University.
- Cauce, A. M., Mason, C., Gonzales, N., Hiraga, Y., & Liu, G. (1996). Social support during adolescence: Methodological and theoretical considerations. Social problems and social contexts in adolescence perspectives across boundaries In K. Hurrelmann, & S. F. Hamilton (Eds.), *Social problems and social contexts in adolescence perspectives across boundaries* (pp. 131-151). New York: Aldine de Gruyter.
- Cha, E. S., Kim, K. H., & Erlen, J. A. (2007). Translation of scales in cross-cultural research: Issues and techniques. *Journal of Advanced Nursing, 58*(4), 386-395.
- Chan, C. G., & Elder, G. H. (2009). Matrilineal advantage in grandchild-grandparent relations. *Gerontologist, 40*, 179-190.
- Chang, Y., Yi, C., & Lin, K. (2008). Kin network and its effects on the psychological wellbeing of the youth. The case of Taiwan. *Journal of Comparative Family Studies, 39*, 19-36.

- Chonody, J. M., Gabb, J., Killian, M., & Dunk-West, P. (2018). Measuring relationship quality in an international study: Exploratory and confirmatory factor validity. *Research on Social Work Practice, 28*(8), 920-930.
- Clark, L. A., & Watson, D. (1995). Constructing validity: Basic issues in objective scale development. *Psychological Assessment, 7*(3), 309-319.
- Clemmens, D. (2003). Adolescent motherhood: A meta-analysis of qualitative studies. *The American Journal of Maternal/ Child Nursing, 28*(2), 93-99.
- Cohen, S., & Wills, T. A. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin, 98*(2), 310-357.
- Colin, V. L. (1996). *Human attachment*. New York: McGraw-Hill.
- Colleta, N. D., & Lee, D. (1983). The impact of support for black adolescent mothers. *Journal of Family, 4*(1), 127-143. doi: 10.1177/019251383004001007
- Collins, N. L. (1996). Working models of attachment: Implications for explanation, emotion, and behavior. *Journal of Personality and Social Psychology, 71*, 810-832.
- Collins, N. L., & Read, S. J. (1990). Adult attachment, working models, and relationship quality in dating couples. *Journal of Personality and Social Psychology, 54*, 644-663. doi: 10.1037/0022-3514.58.4.644
- Connolly, J., Craig, W., Goldberg, A., & Pepler, D. (1999). Conceptions of cross-sex friendships and romantic relationships in early adolescence. *Journal of Youth and Adolescence, 28*(4), 481-494.
- Contreras, J. M. (2004). Parenting behaviors among mainland Puerto Rican adolescent mothers: The role of grandmother and partner involvement. *Journal of Research on Adolescence, 14*(3), 341-368. doi: 10.1111/j.1532-7795.2004.00078.x
- Cook, G. A., & Roggman, L. A. (2010). Three-generation attachment: How grandmothers and mothers contribute to children's attachment security. *Family Science, 1*(2), 112-122.
- Cook, S. M. C., & Cameron, S. T. (2015). Social issues of teenage pregnancy. *Obstetrics, Gynaecology and Reproductive Medicine, 25*(9), 243-248.

- Cozzarelli, C., Karafa, J. A., Collins, N. L., & Tagler, M. J. (2003). Stability and change in adult attachment styles: Associations with personal vulnerabilities, life events, and global construals of self and others. *Journal of Social and Clinical Psychology, 22*, 315-346. doi: 10.1521/jscp.22.3.315.22888
- Craig, L. (2006). Does father care mean fathers share? A comparison of how mothers and fathers in intact families spend time with children *Gender & Society, 20*, 259-281.
- Cramer, D. (2003). Facilitativeness, conflict, demand for approval, self-esteem and satisfaction with romantic relationships. *Journal of Psychology, 137*, 85-98.
- Crnic, K. A., & Low, C. (2002). Everyday stresses and parenting. In M. Bornstein (Ed.), *Handbook of parenting* (2nd ed. Vol. 5, pp. 243-267). Mahwah, NJ: Lawrence Erlbaum Associates.
- Crockenberg, S. B. (1981). Infant irritability, mother responsiveness, and social support influences on the security of infant-mother attachment. *Child Development, 52*(3), 857-865.
- Crowell, J. A., Fraley, R. C., & Shaver, P. R. (1999). Measurement of individual differences in adolescent and adult attachment. In J. Cassidy & P. R. Shaver (Eds.), *Handbook of attachment: Theory, research, and clinical applications* (pp. 434-465). New York: Guilford.
- Crowell, J. A., Fraley, R. C., & Shaver, P. R. (2008). Measurement of individual differences in adolescent and adult attachment. In J. Cassidy & P. R. Shaver (Eds.), *Handbook of attachment: Theory, research, and clinical applications* (pp. 599-634). New York: Guilford Press.
- Cunha, A. I., Relvas, A. P., & Soares, I. (2009). Anorexia nervosa and family relationships: Perceived family functioning, coping strategies, beliefs, and attachment to parents and peers *International Journal of Clinical and Health Psychology, 9*, 229-240.
- Dai, L., & Wang, L. (2015). Review of family functioning. *Open Journal of Social Sciences, 3*, 134-141. doi: 10.4236/jss.2015.312014

- Dauglass, M. J. (2005). *An exploration of the relationship between the perception of mother-daughter relationship, feminist consciousness and self-esteem in the adolescent/ young adult daughter*. Doctoral dissertation, Philosophy, The Faculty of the School of Education, The College of William and Mary.
- David, S. A., Van Dyk, A., & Ashipala, D. O. (2017). Experiences of young adolescent mothers regarding adolescent motherhood in Oshana region. *Journal of Nursing Education and Practice*, 7(12), 39-51.
- Davila, J., Bradbury, T. N., Cohan, C. L., & Tochluk, S. (1997). Marital functioning and depressive symptoms: Evidence for a stress generation model. *Journal of Personality and Social Psychology*, 73(4), 849-861.
- Davila, J., & Cobb, R. J. (2003). Predicting change in self-reported and interviewer-assessed adult attachment: Tests of the individual difference and life stress models of attachment change. *Personality and Social Psychology Bulletin*, 29, 859-870.
- Department of Provincial Affairs. (2016). *Bangkok metropolitan region*. Retrieved from http://en.wikipedia.org/wiki/Bangkok_Metropolitan_Region.
- Devito, J. (2007). Self-perceptions of parenting among adolescent mothers. *Journal of Perinatal Education*, 16(1), 16-23.
- Devito, J. (2010). How adolescent mothers feel about becoming a parent. *The Journal of Perinatal Education*, 19(2), 25-34.
- DeWolff, M. S., & van Ijzendoorn, M. H. (1997). Sensitivity and attachment: A meta analysis on parental antecedents of infant attachment. *Child Development*, 68(4), 571-591.
- Diehl, M., Elnick, A. B., Bourbeau, L. S., & Labouvie-Vief, G. (1998). Adult attachment styles: Their relations to family context and personality. *Journal of Personality and Social Psychology*, 74, 1656-1669.
- Dinero, R. E., Conger, R. D., Shaver, P. R., Widaman, K. F., & Larsen-Rife, D. (2008). Influence of family of origin and adult romantic partners on romantic attachment security. *Journal of Family Psychology*, 22(4), 622-632. doi: 10.1037/a0012506

- Diniz, E., Koller, S. H., & Volling, B. L. (2015). Social support and maternal depression from pregnancy to postpartum: The association with positive maternal behaviours among Brazilian adolescent mothers. *Early Child Development and Care, 185*(7), 1053-1066. doi: 10.1080/03004430.2014.978309
- Doherty, N. A., & Feeney, J. A. (2004). The composition of attachment networks throughout the adult years. *Personal Relationships, 11*, 469-488.
- Dubois-Comtois, K., Cyr, C., Pascuzzo, K., Lessard, M., & Poulin, C. (2013). Attachment theory in clinical work with adolescents. *Journal of Child and Adolescent Behavior, 1*(111). doi: 10.4172/jcalb.1000111
- Epstein, N., Bishop, D., & Levin, S. (1978). The McMaster model of family functioning. *Journal of Marriage and Family Counseling, 4*, 19-31.
- Epstein, N. B., Baldwin, L. M., & Bishop, D. S. (1983). The McMaster family assessment device. *Journal of Marital and Family Therapy, 9*, 171-180. doi: 10.1111/j.1752-0606.1983.tb01497.x
- Erikson, E. H. (1968). *Identity: Youth and crisis*. New York: W.W. Norton.
- Feeney, B. C. (2004). A secure base: Responsive support of goal strivings and exploration in adult intimate relationships. *Journal of Personality and Social Psychology, 87*, 631-648.
- Feeney, J. A. (1996). Attachment, caregiving, and marital satisfaction. *Personal Relationships, 3*, 401-416.
- Feeney, J. A. (1999). Adult romantic attachment and couple relationships. In J. Cassidy, & P. R. Shaver (Eds.), *Handbook of attachment: Theory, research, and clinical applications* (pp. 355-377). New York: Guilford.
- Feeney, J. A. (2008). Adult romantic attachment: Developments in the study of couple relationships. In J. Cassidy, & P. A. Shaver (Eds.), *Handbook of attachment: Theory, research, and clinical applications* (2nd ed., pp. 456-481). New York: Guilford Press.
- Feeney, J. A., & Noller, P. (1990). Attachment style as a predictor of adult romantic relationships. *Journal of Personality and Social Psychology, 58*, 281-291.

- Feldman, R. (2007). Parent-infant synchrony and the construction of shared timing: Physiological precursors, developmental outcomes, and risk conditions. *Journal of Child Psychology and Psychiatry*, 48(3-4), 329-354.
- Fraley, R. C., & Davis, K. E. (1997). Attachment formation and transfer in young adults' close friendships and romantic relationships. *Personal Relationships*, 4, 131-144.
- Fraley, R. C., Heffernan, M. E., Vicary, A. M., & Brumbaugh, C. C. (2011). The experiences in close relationships-relationship structures questionnaire: A method for assessing attachment orientations across relationships. *Psychological Assessment*, 23, 615-625. doi: 10.1037/a0022898
- Fraley, R. C., & Shaver, P. R. (2000). Adult romantic attachment: Theoretical developments, emerging controversies, and unanswered questions. *Review of General Psychology*, 4, 132-154.
- Fraley, R. C., & Waller, N. G. (1998). Adult attachment patterns: A test of the typological model. In J. A. Simpson & W. S. Rholes (Eds.), *Attachment theory and close relationships* (pp. 77-114). New York, NY: Guilford.
- Fraley, R. C., Waller, N. G., & Brennan, K. A. (2000). An item response theory analysis of self-report measures of adult attachment. *Journal of Personality and Social Psychology*, 78, 350-365.
- Fujimori, A., Hayashi, H., Fujiwara, Y., & Matsusaka, T. (2017). Influences of attachment style, family functions and gender differences on loneliness in Japanese University Students. *Psychology*, 8, 654-662.
- Garner, R. E., Arim, R. G., Kohen, D. E., Lach, L. M., MacKenzie, M. J., Brehaut, J. C., & Rosenbaum, P. L. (2013). Parenting children with neurodevelopmental disorders and/or behaviour problems. *Child Care Health and Development*, 39(3), 412-421. doi: 10.1111/j.1365-2214.2011.01347.x
- Gee, C. B., & Rhodes, J. E. (2003). Adolescent mothers' relationship with their children's biological fathers: Social support, social strain and relationship continuity. *Journal of Family Psychology*, 17(3), 370-383. doi:10.1037/0893-3200.17.3.370

- Gee, C., & Rhodes, J. E. (2007). A social support and social strain measure for minority adolescent mothers: A confirmatory factor analytic study. *Childcare Health and Development, 34*, 87-97.
- Gordon, R. A., Chase-Lansdale, P. L., & Brooks-Gunn, J. (2004). Extended households and the life course of young mothers: Understanding the associations using a sample of mothers with premature, low birth weight babies *Child Development, 75*(4), 1013-1038.
- Graham, J., Diebels, K., & Barnow, Z. (2011). The reliability of relationship satisfaction: A reliability generalization meta analysis. *Journal of Family Psychology, 25*(1), 39-48.
- Grau, J., Wilson, K., Weller, E., Castellanos, P., & Duran, P. (2012). Adolescent parenting: Risk and protective factors in the context of poverty. In V. Maholmes, & R. B. King (Eds.), *The Oxford handbook of poverty and child development* (pp.57-182). New York: Oxford University Press.
- Green, B. L., Furrer, C. J., & McAllister, C. L. (2011). Does attachment style influence social support or the other way around?: A longitudinal study of early head start mothers. *Attachment & Human Development, 13*(1), 27-47.
- Greenfield, E. A. (2011). Grandparents involvement and parenting stress among nonmarried mother of young children. *Social Service Review, 85*(1), 135-157.
- Griffin, D., & Bartholomew, K. (1994). Models of the self and other: Fundamental dimensions underlying measures of adult attachment. *Journal of Personality and Social Psychology, 66*(7), 430-445.
- Gyesaw, N. Y. K., & Ankomah, A. (2013). Experiences of pregnancy and motherhood among teenage mothers in a suburb of Accra, Ghana: A qualitative study. *International Journal of Women's Health, 5*, 773-780.
- Hair, J., Anderson, R., Tatham, R., & Black, W. (1998). *Multivariate data analysis* (5th ed.). New Jersey Prentice Hall.
- Hair, J., Black, W., Babin, B., Anderson, R., & Tatham, R. (2006). *Multivariate data analysis* (6th ed.). New Jersey: Pearson.
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis*. (5th ed.). New York: Pearson.

- Hamed, Z., Samavi, S. A., & Askari, M. (2014). The relationship between family function and attachment styles with social adjustment of male and female high school students in Bandar Abbas. *Journal of Applied Environmental and Biological sciences*, 4(5), 105-110.
- Hautamäki, A., Hautamäki, L., Neuvonen, L., & Maliniemi-Piispanen, S. (2010). Transmission of attachment across three generations: Continuity and reversal. *Clinical Child Psychology and Psychiatry*, 15(3), 347-354. doi: 10.1177/1359104510365451
- Hazan, C., & Shaver, P. (1994). Attachment as an organizational framework for research on close relationships. *Psychological Inquiry*, 5, 1-22. doi: 10.1207/s15327965pli0501_1
- Hazan, C., & Shaver, P. R. (1987). Romantic love conceptualized as an attachment process. *Journal of Personality and Social Psychology*, 52, 511-524.
- Hazan, C., & Shaver, P. R. (1990). Love and work: An attachment theoretical perspective. *Journal of Personality and Social Psychology*, 59(2), 270-280. doi: 10.1037/0022-3514.59.2.270
- Hazan, C., & Zeifman, D. (1999). Pairbonds as attachments: Evaluating the evidence. In J. Cassidy, & P. R. Shaver (Eds.), *Handbook of Attachment: Theory, research, and clinical applications* (pp. 336-354). New York: Guilford.
- Hendrick, S., Dicke, A., & Hendrick, C. (1998). The relationship assessment scale. *Journal of Social and Personal Relationships*, 15(1), 137-142.
- Hendrick, S. S. (1988). A generic measure of relationship satisfaction *Journal of Marriage and the Family*, 50, 93-98.
- Herrman, J. W., & Nandakumar, R. (2012). Development of a survey to assess adolescent perceptions of teen parenting. *Journal of Nursing Measurement*, 20, 3-20.
- House, J. (1981). *Work stress and social support*. Massachusetts: Addison-Wesley.
- Hooper, D., Caughlan, J., & Mullen, M. (2008). Structural equation modeling: Guidelines for determining model fit. *The Electronic Journal of Business Research Methods*, 6(1), 53-60.

- Hu, L., & Bentler, P. M. (1998). Fit indices in covariance structure modeling: Sensitivity to underparameterized model misspecification. *Psychological Methods*, 3(4), 424-453.
- Hupcey, J. E. (1998). Clarifying the social support theory research linkage. *Journal of Advanced Nursing*, 27(6), 1231-1241.
- Ishak N. M., Yunus, M. M., & Iskandar, I. P. (2010). Trust, communication and healthy parental attachment among Malaysian academically talented college students. *Procedia Social and Behavioral Sciences*, 9, 1529-1536.
- Jahangir, P. (2012). Comparing family function and matrimonial satisfaction in married females (employees and housewives) in Tehran *Educational Management Researches Magazine*, 3(4), 178-192.
- Jarvis, P. A., & Creasey, G. L. (1991). Parental stress, coping, and attachment in families with an 18-month-old infant. *Infant Behavior and Development*, 14(4), 383-395.
- Johnson-Garner, M. Y., & Meyers, S. A. (2003). What factors contribute to the resilience of African-American children within kinship care? *Child and Youth Care Forum*, 32(5), 255-269.
- Johnson, E. B. (2000). Mothers at work: Representations of maternal practice in literature. In R. O'Reilly, & S. Abbey (Eds.), *Mothers and daughters: connection, empowerment, and transformation* (pp. 21-36). Lanham, MD: Rowman & Littlefield.
- Jonsdottir, S. S., Thome, M., Steingrimsdottir, T., Lydsdottir, L. B., Sigurdsson, J. F., Olafsdottir, H., & Swahnberg, K. (2017). Partner relationship, social support and perinatal distress among pregnant Icelandic women. *Women Birth*, 30(1), e46-e55. doi: 10.1016/j.wombi.2016.08.005
- Kaewjanta, N. (2012). Depression in teenage pregnancy: Factors, affect and prevention. *Journal of Nursing Science & Health*, 35(1), 83-90.
- Kalil, A., & Danziger, S. K. (2000). How teen mothers are faring under welfare reform *Journal of Social Issues*, 56(4), 775- 798.

- Kamphaengphan, S., Kaewpornawan, T., & Apinuntavech, S. (2011). Psychosocial factors associated with teenage pregnancy attending antenatal care clinic at Siriraj hospital. *Journal of the Psychiatric Association of Thailand*, 56(3), 255-266.
- Kapaneer, A. R. M., & Rao, K. (2007). Attachment style in relation to family functioning and distress in college students. *Journal of the Indian Academy of Applied Psychology* 33, 15-21.
- Katz, J., Beach, S. R. H., & Anderson, P. (1996). Self-enhancement versus self-verification: Does spousal support always help?. *Cognitive Therapy and Research*, 20, 345-360.
- Katowitz, A. E. (2007). *Family structures and adult romantic relationships*. Retrieved from <https://core.ac.uk/download/pdf/46725234.pdf>
- Kearney, M. S., & Levine, P. B. (2012). Why is the teen birth rate in the United States so high and why does it matter? *Journal of Economic Perspectives*, 26(2), 141-163.
- Khan, F., & Aftab, S. (2013). Marital satisfaction and perceived social support as vulnerability factors to depression. *American International Journal of Social Science*, 2(5), 99-109.
- Khodarahimi, S., Hashim, I. H. M., & Mohd-Zaharim, N. (2016). Attachment styles, perceived stress and social support in a Malaysian young adults sample. *Psychologica Belgica*, 56(1), 65-79. doi: 10.5334/pb.320
- Kim, D. H., Kang, N. R., & Kwack, Y. S. (2019). Differences in parenting stress, parenting attitudes, and parents' mental health according to parental adult attachment style. *Journal of the Korean Academy of Child and Adolescent Psychiatry*, 30(1), 17-25. doi: org/10.5765/jkacap.180014
- Kim, K. E., & Chol, J. H. (2015). Sources of parenting stress for mothers and fathers of young children. *Indian Journal of Science and Technology*, 8(35), 1-8. doi: 10.17485/ijst/2015/v8i35/85924
- Kline, R. B. (2011). *Methodology in the social sciences: Principles and practice of structural equation modeling* (3rd ed.). New York: Guilford Press.

- Klongdee, K., Nintachan, P., & Sangon S. (2016). Factors related to parenting stress in caregivers of children with attention-deficit/hyperactivity disorder. *The Journal of Psychiatric Nursing and Mental Health*, 30(1), 52-68.
- Konrath, S. H., Chopik, W. J., Hsing, C. K., & O'Brien, E. (2014). Changes in adult attachment styles in American college students over time: A meta analysis. *Personality and Social Psychology Review*, 18(4), 326-348. doi: 10.1177/1088868314530516
- Kretchmar, M. D., & Jacobvitz, D. B. (2002). Observing mother-child relationships across generations: Boundary patterns, attachment, and the transmission of caregiving. *Family Process*, 41, 351-374.
- Kullik, A., & Petermann, F. (2013). Attachment to parents and peers as a risk factor for adolescent depressive disorders: The mediating role of emotion regulation. *Child Psychiatry and Human Development*, 44(4), 537-548. doi: 10.1007/s10578 01203475
- Kurdek, L. A. (2005). Gender and marital satisfaction early in marriage: A growth curve approach. *Journal of Marriage and Family*, 67, 68-74.
- Laghi, P., Baumgartner, E., Riccio, G., Bohr, Y., & Dhayanndhan, B. (2013). The role of romantic and social support in Italian adolescent mother' live. *Journal of Child and Family Studies*, 22, 1074-1081.
- Lamb, M. E., Pleck, J. H., Charnov, E. L., & Levine, J. A. (1987). A biosocial perspective on paternal care and involvement. In J. B. Lancaster, J. Altmann, A. Rossi, & L. Sherrod (Eds.), *Parenting across the lifespan: Biosocial dimensions* (pp. 111-142). New York: A. de Gruyter.
- Leelatrakarnkun, K., & Trangkasombat, U. (2012). The association between depression and family functioning in seventh grade students in Ubonratchathani province. *Journal of the Psychiatric Association of Thailand*, 57(1), 29-38.
- Leese, M. (2016). The bumpy road to becoming: Capturing the stories that teenage mothers told about their journey into motherhood. *Child & Family Social Work*, 21, 521-529.

- Lei, M., & Lomax, R. G. (2005). The effect of varying degrees of nonnormality in structural equation modeling. *Structural Equation Modeling: A Multidisciplinary Journal*, 12(1), 1-27.
- Lessenberry, B. M., & Rehfeldt, R. A. (2004). Evaluating stress levels of parents of children with disabilities. *Exceptional Children*, 70(2), 231-244.
- Levitt, M. J., Guacci, N., & Weber, R. A. (1992). Intergenerational support, relationship quality, and well being: A bicultural analysis. *Journal of Family Issues*, 13(4), 465-481. doi: 10.1177/019251392013004005
- Levy, K. N., Blatt, S. J., & Shaver, P. R. (1998). Attachment styles and parental representations. *Journal of Personality and Social Psychology*, 74, 407-419.
- Lin, X., Zhang, Y., Chi, P., Ding, W., Heath, M. A., Fang, X., & Xu, S. (2017). The mutual effect of marital quality and parenting stress on child and parent depressive symptoms in families of children with oppositional defiant disorder. *Frontiers in Psychology*, 8, 1-11. doi: 10.3389/fpsyg.2017.01810
- Littleton, L., & Engebretson, J. (2005). *Maternity nursing care*. New York: Delmar Learning.
- Liu, Q., Shono, M., & Kitamura, T. (2008). The effects of perceived parenting and family functioning on adult attachment: A sample of Japanese university students. *Open Family Studies Journal*, 1, 1-6.
- Logsdon, M. C., Birkimer, J. C., Simpson, T., & Looney, S. (2005). Postpartum depression and social support in adolescents. *Journal of Obstetric, Gynecologic, and Neonatal Nursing*, 34, 46-54. doi: 10.1177/0884217504272802.
- Logsdon, M. C., & Koniak-Griffin, D. (2005). Social support in postpartum adolescents: Guidelines for nursing assessments and interventions. *Journal of Obstetric, Gynecologic, & Neonatal Nursing*, 34(6), 761-768.
- Logsdon, M. C., McBride, A. B., & Birkimer, J. C. (1994). Social support and postpartum depression. *Research in Nursing & Health*, 17, 449-457.
- Logsdon, M. C., Usui, W., Birkimer, J. C., & McBride, A. B. (1996). The postpartum support questionnaire: Reliability and validity. *Journal of Nursing Measurement* 4(2), 129-142.

- Loubser, J. (2007). *Attachment theory and adult intimate relationships*. Master's thesis, Clinical Psychology & Community Counselling, Faculty of Arts and Social Sciences, University of Stellenbosch.
- Lubiewska, K., & Derbis, R. (2016). Relations between parenting stress, attachment, and life satisfaction in mothers of adolescent children. *Polish Journal of Applied Psychology, 14*(2), 87-112.
- Main, M., Kaplan, N., & Cassidy, J. (1985). Security in infancy, childhood, and adulthood: A move to the level of representation. *Monographs of the Society for Research in Child Development, 50*(1-2), 66-10
- Manachevakul, S., Prasopkittikun, T., & Sangperm, P. (2012). Factors predicting parenting stress in mothers of infants. *Journal of Nurses' Association of Thailand, North eastern Division, 30*(1), 53-62.
- Maposa, S., & SmithBattle, L. (2008). Preliminary reliability and validity of the grandparent version of the grandparent support scale for teenage mothers (GSSTM-G). *Journal of Family Nursing, 14*(2), 224-241. doi: 10.1177/1074840708317059
- Maroufizadeh, S., Omani-Samani, R., Almasi-Hashiani, A., Navid, B., Sobati, B., & Amini, P. (2018). The relationship assessment scale (RAS) in infertile patients: A reliability and validity study. *Middle East Fertility Society Journal, 23*(4) 471-475. doi: 10.1016/j.mefs.2018.04.001
- Martell, L. K. (1990). Perceptions of equity by mothers and daughters during daughter's first pregnancy. *Family Relations, 39*, 305-310.
- Mazzeschi, C., Pazzagli, C., Radi, G., Raspa, V., & Buratta, L. (2015). Antecedents of maternal parenting stress: The role of attachment style, prenatal attachment, and dyadic adjustment in first-time mothers. *Frontiers in Psychology, 24*(6), 1-19. doi: 10.3389/fpsyg.2015.01443
- Melender, H. L. (2002). Experiences of fears associated with pregnancy and childbirth: A study of 329 pregnant women. *Birth, 29*(2), 101-111.

- Mikulincer, M., & Shaver, P. R. (2003). The attachment behavioral system in adulthood: Activation, psychodynamics, and interpersonal processes. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 35, pp. 53-152). New York: Academic Press.
- Mikulincer, M., & Shaver, P. R. (2007). *Attachment in adulthood: Structure, dynamics and change*. New York: Guilford Press.
- Miller-Scher, J. L. (1997). *Fathers' involvement with infant care*. Doctoral dissertation, Philosophy, Faculty of the Graduate School, Emory University.
- Miller, I. W., Ryan, C. E., Keitner, G. I., Bishop, D. S., & Epstein, N. B. (2000). The mcmaster approach to families: Theory, assessment, treatment and research. *Journal of Family Therapy*, 22, 168-189. doi: 10.1111/1467-6427.00145
- Miller, P. M., & Commons, M. L. (2010). The benefits of attachment parenting for infants and children: A behavioural developmental view. *Behavioral Development, Bulletin*, 10, 1-14.
- Miller, S. D., Duncan, B. L., Brown, J., Sparks, J., & Claud, D. (2003). The outcome rating scale: A preliminary study of the reliability, validity, and feasibility of a brief visual analog measure. *Journal of Brief Therapy*, 2(2), 91-100.
- Mollborn, S., & Dennis, J. A. (2012). Investigating the life situations and development of teenage mothers' children: Evidence from the ECLS-B. *Population Research and Policy Review*, 31(1), 31-66.
- Moller, N. P., Fouladi, R. T., McCarthy, C. J., & Hatch, K. D. (2003). Relationship of attachment and social support to college students' adjustment following a relationship breakup. *Journal of Counseling and Development*, 81(3), 354-369. doi: 10.1002/j.1556-6678.2003.tb00262.x
- Morinis, J., Carson, C., & Quigley, M. A. (2013). Effect of teenage motherhood on cognitive outcomes in children: A population-based cohort study. *Archives of Disease in Childhood*, 98(12), 959-964.
- Mothersead, P. K., Kivlighan, D. M. J., & Wynkoop, T. F. (1998). Attachment, family dysfunction, parental alcoholism, and interpersonal distress in late adolescence: A structural model. *Journal of Counseling Psychology*, 45(2), 196-203. doi: 10.1037/0022-0167.45.2.196

- Mphatswe, W., Maise, H., & Sebitloane, M. (2016). Prevalence of repeat pregnancies and associated factors among teenagers in KwaZulu-Natal, South Africa. *International Journal of Gynecology & Obstetrics*, 133 (2), 152-155.
- Mulder, C. (2009). *Adolescent mothers' relationships with their mothers: Communication, support and shared caregiving*. Doctoral dissertation, Philosophy in Social Work, Graduate College, University of Illinois at Urbana-Champaign.
- Nakagawa, M., Teti, D. M., & Lamb, M. E. (1992). An ecological study of child-mother attachments among Japanese sojourners in the United States. *Developmental Psychology*, 28(4), 584-592. doi: 10.1037/0012-1649.28.4.584
- Narong, T. (2013). *Effects of the maternal role enhancing program on perception of family support and success in maternal roles attainment among postpartum adolescents*. Master's Thesis, Advanced midwifery, Faculty of the Nursing, Burapha University.
- Neinstein, L. S. (1996). *Adolescent health care: A practical guide* (3rd ed.). Baltimore: Williams and Wilkins.
- Neuman, W. L. (1991). *Social research methods: Qualitative and quantitative approaches*. Boston: Allyn and Bacon.
- Nilsen, W., Karevold, E., Roysamb, E., Gustavson, K., & Mathiesen, K.S. (2013). Social skills and depressive symptoms across adolescence: Social support as a mediator in girls versus boys. *Journal of Adolescence*, 36, 11-20. doi: org/10.1016/j.adolescence.2012.08.005
- Ngum Chi Watts, M. C., Liamputtong, P., & McMichael, C. (2015). Early motherhood: A qualitative study exploring the experiences of African Australian teenage mothers in greater Melbourne, Australia. *BMC Public Health*, 15(873). doi: 10.1186/s12889-015-2215-2
- Notman, M. T. (2006). Mothers and daughters as adults. *Psychoanalytic Inquiry*, 26, 137-153.
- Oberlander, S. E., Black, M. M., & Starr, R. H. J. (2007). African American adolescent mothers and grandmothers: A multigenerational approach to parenting. *American Journal of Community Psychology*, 39, 37-46.

- Oldehinkel, A. J., Verhulst, F. C., & Ormel, J. (2011). Mental health problems during puberty: Tanner stage-related differences in specific symptoms. The TRAILS study. *Journal of Adolescence*, *34*, 73-85.
- Olson, D. H. (1993). Circumplex model of marital and family systems. *Journal of Family Therapy*, *22*, 144-167.
- Overall¹, N. C., Fletcher, G. J. O., & Simpson, J. A. (2010). Helping each other grow: Romantic partner support, self-improvement, and relationship quality. *Personality and Social Psychology Bulletin*, *36*(11), 1496-1513. Doi: 10.1177/0146167210383045
- Overbeek, G., Vollebergh, W., Engels, R. C. M. E., & Meeus, W. (2003). Young adults' relationship transitions and the incidence of mental disorders: A three-wave longitudinal study. *Social Psychiatry and Psychiatric Epidemiology*, *38*, 669-676. doi: 10.1007/s00127-003-0689-1
- Oxford, M., & Spieker, S. (2006). Preschool language development among children of adolescent mothers. *Journal of Applied Developmental Psychology*, *27*(2), 165-182.
- Papini, D. R., Roggmann, L. A., & Anderson, J. (1991). Early adolescent perceptions of attachment to mother and father: A test of emotional-distancing and buffering hypothesis. *Journal of Early Adolescence*, *11*, 258-278.
- Pasch, L. A., & Bradbury, T. N. (1998). Social support, conflict and the development of marital dysfunction. *Journal of Consulting and Clinical Psychology*, *66*, 219-230.
- Paskiewicz, L. (2001). Pregnant adolescents and their mothers: A shared experience of teen mothering. *MCN: The American Journal of Maternal Child Nursing*, *26*(1), 33-38.
- Payjapoh, C. (2017). The effects of an adjustment-promoting program on the stress management skills of mothers of children with attention deficit hyperactivity disorder. *Journal of The Royal Thai Army Nurses*, *20*(3), 286-295.
- Payjapoh, C., Kongsaktrakul, C. & Vallibhakara, S. (2017). Predicting factors of care behaviors among caregivers of newborns up to 5 years old after open heart surgery. *Journal of Nursing Science & Health*, *40*(4), 134-141.

- Pfaller, J., Kiselica, M., & Gerstein, L. (1998). Attachment style and family dynamics in young adults. *Journal of Counseling Psychology, 45*(3), 353-357. doi: 10.1037/0022-0167.45.3.353
- Phoodaangau, B., Deoisres, W., & Chunlestskul, K. (2013). Maternity experience: A new role of unexpectedly pregnant students. *Thai Journal of Nursing Council, 28*(2), 58-74.
- Pietromonaco, P. R., & Barrett, L. F. (1997). Working models of attachment and daily social interactions. *Journal of Personality and Social Psychology, 73*(6), 1409-1423. doi: 10.1037/0022-3514.73.6.1409
- Pietromonaco, P. R., & Barrett, L. F. (2000). The internal working models concept: What do we really know about the self in relation to others?. *Review of General Psychology, 4*, 155-175.
- Pong, S.-L., Johnston, J., & Chen, V. (2010). Authoritarian parenting and Asian adolescent school performance: Insights from the US and Taiwan. *International Journal of Behavioral Development, 34* (1), 62-72.
- Potard, C., Courtois, R., Réveillère, C., Bréchon, G., & Courtois, A. (2017). The relationship between parental attachment and sexuality in early adolescence. *International Journal of Adolescence and Youth, 22*(1), 47-56.
- Prasopkittikun, T., Tilokskulchai, F., & Vipuro, N. (2010). Relationship between selected factors and parenting stress in mothers. *Journal of Nursing Science, 28*(1), 19-27.
- Priel, B., & Besser, A. (2002). Perceptions of early relationships during the transition to motherhood: The mediating role of social support. *Infant Mental Health Journal, 23*(4), 343-360.
- Priel, B., & Shamai, D. (1995). Attachment style and perceived social support: Effects on affect regulation. *Personality and Individual Differences, 19*(2), 235-241. doi: 10.1016/0191-8869(95)91936-T
- Ramayah, T., Lee J. W. C., & In, J. B.C. (2011). Network collaboration and performance in the tourism sector. *Service Business 5*(4), 411-428

- Raudino, A., Fergusson, D. M., & Horwood, L. J. (2013). The quality of parent/ child relationships in adolescence is associated with poor adult psychosocial adjustment. *Journal of Adolescence*, *36*(2), 331-340.
- Rawatlal, N., Kliewer, W., & Pillay, B. J. (2015). Adolescent attachment, family functioning and depressive symptoms. *South African Journal of Psychiatry*, *21*(3), 80-85. doi: 10.4102/sajpsychiatry.v21i3.672
- Renshaw, K. D., McKnight, P., Caska, C. M., & Blais, R. K. (2010). The utility of the relationship assessment scale in multiple types of relationships. *Journal of Social and Personal Relationships*, *28*(2011), 435-447.
- Rholes, W. S., Simpson, J. A., & Friedman, M. (2006). Avoidant attachment and the experience of parenting. *Personality and Social Psychology Bulletin*, *32*, 275-285. doi: 10.1177/ 0146167205280910.
- Riggs, S. A., & Han, G. (2009). Predictors of anxiety and depression in emerging adulthood. *Journal of Adult Development*, *16*(1), 39-52. doi: 10.1007/s10804-009-9051-5
- Riva Crugnola, C., Ierardi, E., Gazzotti, S., & Albizzati, A. (2014). Motherhood in adolescent mothers: Maternal attachment, mother-infant styles of interaction and emotion regulation at three months. *Infant Behavior and Development*, *37*, 44-56.
- Ronnlund, M., & Karlsson, E. (2006). The relation between dimensions of attachment and internalizing or externalizing problems during adolescence. *The Journal of Genetic Psychology*, *167*, 47-63. doi: 10.3200/GNTP.167.1.47-63
- Rossi, A. S. (1993). Intergenerational relations: Gender, norms, and behavior. In V. L. Bengtson, & W. A. Achenbaum (Eds.), *The changing contract across generations* (pp. 191-212). New York: Aldine de Gruyter.
- Rossi, A. S., & Rossi, P. H. (1990). *Of human bonding: Parent-child relations across the life course*. New York: Aldine de Gruyter.
- Rubin, K., Dwyer, K., Kim, A., Burgess, K., Booth-Laforce, C., & Rose-Krasnor, L. (2004). Attachment, friendship, and psychosocial functioning in early adolescence. *The Journal of Early Adolescence*, *24*(4), 326-356.

- Ruedingera, E., & Cox, J. (2012). Adolescent childbearing: Consequences and interventions. *Current Opinion in Pediatrics*, 24, 446-452. doi: 10.1097/MOP.0b013e3283557b89
- Ruhl, H., Dolan, E. A., & Buhrmester, D. (2015). Adolescent attachment trajectories with mothers and fathers: The importance of parent-child relationship experiences and gender. *Journal of Adolescent Research*, 25(3), 427-442. doi: 10.1111/jora.12144.
- Sadler, L. S., & Clemmens, D. A. (2004). Ambivalent grandmothers raising teen daughters and their babies. *Journal of Family Nursing*, 10(2), 211-231.
- Scharfe, E., & Bartholomew, K. (1994). Reliability and stability of adult attachment patterns. *Personal Relationships*, 1(1), 23-43.
- Schmitt, D., Alcalay, L., Allensworth, M., Allik, J., Ault, L., Austers, I., Bennett, K., Bianchi, G., Boholst, F., Cunen, M., Verissimo, J., & Petrovic, N. (2004). Patterns and universals of adult romantic attachment across 62 cultural regions: Are models of self and of other pan cultural constructs? *Journal of Cross Cultural Psychology*, 35, 367-402. doi: 10.1177/0022022104266105
- Schumacker, R. E., & Lomax, R. G. (2010). *A beginner's guide to structural equation modeling* (3rd ed.). New York: Routledge Academic.
- Sedgh, G., Finer, L. B., Bankole, A., Eilers, M. A., & Singh, S. (2015). Adolescent pregnancy, birth, and abortion rates across countries: Levels and recent trends. *Journal of Adolescent Health*, 56(2), 223-230. doi: 10.1016/j.jadohealth.2014.09.007
- Seginer, R., Vermulst, A., & Gerris, J. (2002). Bringing up adolescent children: A longitudinal study of parents' child-rearing stress. *International Journal of Behavioral Development*, 26(5), 410-422.
- Sellers, K., Black, M. M., Boris, N. W., Oberlander, S. E., & Myers, L. (2011). Adolescent mothers' relationships with their own mothers: Impact on parenting outcomes. *Journal of Family Psychology*, 25(1), 117-126. doi: 10.1037/a0021877

- Sgarbpssa, D., & Ford-Giiboe, M. (2004). Mother's friendship quality, parental support, quality of life, and family health work in families led by adolescent mothers with preschool children. *Journal of Family Nursing, 10*(2), 232-261.
- Shahyad, S., Besharat, M. A., Asadi, M., ShirAlipour, A., & Miri, M. (2011). The relation of attachment and perceived social support with life satisfaction: Structural equation model. *Procedia Social and Behavioral Sciences, 15*, 952-956. doi: 10.1016/j.sbspro.2011.03.219
- Shannon, C. S., & Shaw, S. M. (2008). Mothers and daughters: Teaching and learning about leisure. *Leisure Sciences, 30*, 1-16.
- Shaver, P. R., & Hazan, C. (1988). A biased overview of the study of love. *Journal of Social and Personal Relationships, 5*, 473-501.
- Shaver, P. R., Hazan, C., & Bradshaw, D. (1988). Love as attachment: The intergration of three behavioral systems. In R. J. Stenberg, & M. L. Barnes (Eds.), *The psychology of love* (pp. 68-99). New Haven: Yale University Press.
- Shaver, P. R., & Mikulincer, M. (2002). Attachment related psychodynamics. *Attachment and Human Development, 4*, 133-161.
- Sheftall, A. H., Mathias, C. W., Furr, R. M., & Dougherty, D. M. (2013). Adolescent attachment security, family functioning, and suicide attempts. *Attachment & Human Development, 15*(4), 368-383. doi: 10.1080/14616734.2013.782649
- Silberman, S. (2016). *Effects of grandmother childcare involvement, supportiveness, and acceptance on Latina adolescent mother-child dyadic synchrony*. Doctoral dissertation, Department of Psychology, Philosophy, College of Arts and Sciences, Kent State University.
- Silverstein, M., & Ruiz, S. (2006). Breaking the chain: How grandparents moderate the transmission of maternal depression to their grandchildren. *Family Relations, 55*(5), 601-612.
- Simpson, J. A., & Rholes, W. S. (1994). Stress and secure base relationships in adulthood, in attachment processes in adulthood. In K. Bartholomew, & D. Perlman (Eds.), *Advances in personal relationships* (Vol. 5, pp. 181-204). London: Kingsley.

- Simpson, J. A., & Rholes, W. S. (2012). Adult attachment orientation, stress, and romantic relationship. *Advance in Experimental Social Psychology*, *45*, 279-328.
- Simpson, J. A., Rholes, W. S., & Phillips, D. (1996). Conflict in close relationships: An attachment perspective. *Journal of Personality and Social Psychology*, *71*(5), 899-914.
- Singh, K., Bickley, P. G., Trivette, P., Keith, T. Z., Keith, P. B., & Anderson, E. (1995). The effects of four components of parental involvement on eighth-grade student achievement: Structural analysis of NELS-88 Data. *School Psychology Review*, *24*(2), 299-317.
- Smith, P. K., & Drew, L. M. (2002). Grandparenthood. In M. H. Borenstein (Ed.), *Handbook of parenting* (Vol. 3, pp. 141-169). Mahwah, NJ: Lawrence Erlbaum.
- Sroufe, L. A., & Waters, E. (1977). Attachment as an organizational construct. *Child Development*, *48*, 1184-1199.
- Stanton, S. C. E., & Campbell, L. (2014). Psychological and physiological predictors of health in romantic relationships: An attachment perspective. *Journal of Personality*, *82*(6), 528-538.
- Starrels, M. E. (1994). Gender differences in parent-child relations. *Journal of Family Issues*, *15*, 148-165.
- Stiles, W. B., Barkham, M., Mellor-Clark, J., & Connell, J. (2008). Effectiveness of cognitive-behavioural, person-centred, and psychodynamic therapies in UK primary-care routine practice: Replication in a larger sample. *Psychological Medicine*, *38*(5), 677-688.
- Suriyanimitsuk, T., Deoiseres, W., Wongnum, P., & Williams, P. D. (2015). A causal model of late postpartum depression and its effects on maternal roles. *Journal of Health Science Research*, *9*(1), 16-24.
- Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics* (5th ed.). New York: Allyn & Bacon/ Pearson.

- Tanaka, N., Hasui, C., Uji, M., Hiramura, H., Chen, Z., Shikai, N., & Kitamura, T. (2008). Correlates of the categories of adolescent attachment styles: Perceived rearing, family function, early life events, and personality. *Psychiatry and Clinical Neurosciences*, *62*(1), 65-74. doi: 10.1111/j.1440-1819.2007.01777.x
- Tantives, S., Philasan, S., Yamabhai, I., Teerawattananon, Y., Yothasamuth, C. (2013). *Adolescent pregnancy in Thailand 2013*. Nonthaburi, Thailand: Department of Health, Ministry of Public Health,.
- Thaithae, S., & Thato, R. (2011). Obstetric and perinatal outcomes of teenage pregnancies in Thailand. *Journal of Pediatric & Adolescent Gynecology*, *24*(6), 342-346.
- Thailand Bureau of Reproductive Health. (2015). *Fact sheet: Teenage reproductive health*. Nonthaburi: Ministry of Public Health.
- Thompson, R. A., Flood, M. F., & Goodvin, R. (2006). Social support and developmental psychopathology. In D. Cicchetti, & D. Cohen (Eds.), *Developmental psychopathology* (2nd ed., Vol. 3). New York: Wiley.
- Trangkasombat, U. (2006). Family functioning in the family of psychiatric patients: A comparison with nonclinical families. *Journal of Medicine Association Thai*, *89*(11), 1946-1953.
- Troll, L., & Fingerman, K. L. (1996). Parent/ child bonds in adulthood. In C. Malestesta-Magai, & S. McFadden (Eds.), *Handbook of emotion, adult development and aging* (pp. 185-205). Orlando: Academic Press.
- Trute, B. (2003). Grandparents of children with developmental disabilities: Intergenerational support and family well being. *Families in Society*, *84*, 119-126.
- Tumhiran, K., & Dechakhup, J. (2010). *Family live status of parent adolescent and social service for family. The conference on family study: Think and learn to help Thai families*. nonthaburi: Sukhothai Thammathirat Open University.
- Tyson, P. (1991). Some nuclear conflicts of infantile neurosis in female development. *Psychoanalytic Inquiry*, *11*, 582-601.

- van Schaick, K., & Stolberg, A. L. (2001). The impact of paternal involvement and parental divorce on young adults' intimate relationships. *Journal of Divorce & Remarriage*, 36(1-2), 99-122. doi: 10.1300/J087v36n0106
- Vieira, J. M., Avila, M., & Matos, P. M. (2012). Attachment and parenting: The mediating role of work-family balance in portuguese parents of preschool children. *Family Relations*, 61, 31-50.
- Vondra, J. I., Shaw, D. S., & Kevenides, C. (1995). Predicting infant attachment classification from multiple, contemporaneous measures of maternal care. *Infant Behavior and Development*, 18(4), 415-525. doi: 10.1016/0163-6383(95)90031-4
- Wallis, A., Miskovic-Wheatley, J., Madden, S., Rhodes, P., Crosby, R. D., Cao, L., & Touyz, S. (2017). How does family functioning effect the outcome of family based treatment for adolescents with severe anorexia nervosa? *Journal of Eating Disorders*, 5(55), doi: 10.1186/s40337-017-0184-9
- Wambua, G. N., Obondo, A., Bifulco, A., & Kumar, M. (2018). The role of attachment relationship in adolescents' problem behavior development: A cross-sectional study of Kenyan adolescents in Nairobi city. *Child and Adolescent Psychiatry and Mental Health*, 12, 27. doi: 10.1186/s13034-018-0237-0
- Wan, C. K., Jaccard, J., & Ramey, S. L. (1996). The relationship between social support and life satisfaction as a function of family structure. *Journal of Marriage and the Family*, 58(2), 502-513. doi: 10.2307/353513
- Wanna, R., & Lueboonthavatchai, P. (2015). Prevalence of complicated grief and associated factors in psychiatric outpatients at King Chulalongkorn Memorial Hospital. *Journal of the Psychiatric Association of Thailand*, 60(2), 85-98.
- Wei, M., Russell, D. W., Mallinckrodt, B., & Vogel, D. L. (2007). The experience in close relationships scale (ECR)-short form: Reliability, validity, and factor structure. *Journal of Personality Assessment*, 88, 187-204.
- Wichaiya, W. (2013). *The teenage mother: Lived experiences and gender*. Master's thesis, Antropology, Faculty of Sociology and Anthropology, Thammasart University.

- Wongpakaran, T., & Wongpakaran, N. (2012). A short version of the revised 'experience of close relationships questionnaire' investigating non clinical and clinical samples. *Clinical Practice & Epidemiology in Mental Health*, 8, 36-42.
- Wongvisetsirikul, P. (1997). *Relationships among personal factors, marital relationship, social support, self-esteem, transition to motherhood, and postpartum anxiety and depression in first-time mothers*. Doctoral dissertation, Maternity and Newborn Nursing, Faculty of Nursing, Mahidol University.
- Woodhouse, S. S., Dykas, M. J., & Cassidy, J. (2009). Perceptions of secure base provision within the family. *Attachment & Human Development*, 11, 47-67. doi: 10.1080/14616730802500792
- World Bank. (2015). *Adolescent fertility rate (births per 1,000 women ages 15-19)*. Retrieved from <http://data.worldbank.org/indicator/SP.ADO.TFRT>
- World Health Organization [WHO]. (2018a). *Adolescent pregnancy*. Geneva: World Health Organization.
- World Health Organization [WHO]. (2018b). *Maternal, newborn, child and adolescent health*. Geneva: World Health Organization.
- Wheaton, B., Muthen, B., Alwin, D. F., & Summers, G. (1977). Assessing reliability and stability in panel models. *Sociological Methodology*, 8, 84-136.
- Yodthong, D., Seeherunwong, A., Kongsuriyanavin, W., & Pornchaikate, A. A. Y. (2014). Correlation between age, caregiving burden feelings and depressive symptoms in grandparents rearing their grandchildren. *Thai Journal of Nursing Council*, 29(1), 108-121.
- Yoo, G. S. (2004). Attachment relationship between young adult daughter and their mother. *Journal of Comparative Family Studies*, 35(1), 21-32.
- Yurdakul, M. (2018). Perceived social support in pregnant adolescents in Mersin area in Turkey. *Pakistan Journal of Medical Sciences*, 34(1), 115-120. doi: org/10.12669/pjms.341.14221
- Zhang, F., & Labouvie-Vief, G. (2004). Stability and fluctuation in adult attachment style over a 6-year period. *Attachment & Human Development*, 6(4), 419-437.

Zvelc, G. (2010). Object and subject relations in adulthood-towards an integrative model of interpersonal relationships. *Psychiatria Danubina*, 22(4), 498-508.





APPENDICES



APPENDIX A
Inviting documents of experts



สำเนา

บันทึกข้อความ

ส่วนงาน คณะพยาบาลศาสตร์ งานบริการการศึกษา (บัณฑิตศึกษา) โทร. ๒๘๐๘
ที่ ศธ ๖๒๐๖/๒๕๕๗ วันที่ ๒๕ เมษายน พ.ศ. ๒๕๖๐
เรื่อง ขอเรียนเชิญบุคลากรในสังกัดของท่านเป็นผู้แปลเครื่องมือเพื่อการวิจัย

เรียน ผู้อำนวยการสถาบันภาษา

ด้วย นางสาวนุชรีร์ แสงสว่าง รหัสประจำตัว ๕๕๘๑๐๐๐๙ นิสิตหลักสูตรปรัชญาดุษฎีบัณฑิต สาขาวิชาพยาบาลศาสตร์ (หลักสูตรนานาชาติ) คณะพยาบาลศาสตร์ มหาวิทยาลัยบูรพา ซึ่งอยู่ระหว่างการศึกษารายวิชา ๑๑๒๘๑๘ Independent Nursing Inquiry โดยมีรองศาสตราจารย์ ดร. นุจรี ไชยมงคล เป็นอาจารย์ที่ปรึกษาทางวิชาการ และอยู่ในขั้นตอนการเตรียมเครื่องมือเพื่อการเก็บรวบรวมข้อมูลในการวิจัย หัวข้อ “The Validity and Reliability of The Inventory of Parent and Peer Attachment In Thai Version” ในกรณีนี้ คณะฯ พิจารณาแล้วเห็นว่า ผู้ช่วยศาสตราจารย์ ดร.ศิริลักษณ์ อุสาหะ บุคลากรในสังกัดของท่านเป็นผู้มีความเชี่ยวชาญ และประสบการณ์สูง จึงขอเรียนเชิญเป็นผู้แปลเนื้อหาของเครื่องมือวิจัยกลับจากภาษาไทยเป็นภาษาอังกฤษเพื่อใช้ในการวิจัยของนิสิตดังกล่าว โดยมีเครื่องมือวิจัย คือ The Inventory of Parent and Peer Attachment (IPPA) (ภาษาไทย)

ทั้งนี้ หากมีปัญหาหรือต้องการข้อมูลเพิ่มเติม โปรดติดต่อผู้วิจัย โทร ๐๘ ๙๑๕๖ ๗๒๔๒

จึงเรียนมาเพื่อโปรดพิจารณาให้เกียรติเป็นผู้แปลเครื่องมือวิจัยดังกล่าวด้วย จะขอบคุณยิ่ง

(รองศาสตราจารย์ ดร.นุจรี ไชยมงคล)
คณบดีคณะพยาบาลศาสตร์

สำเนาเรียน ผู้ช่วยศาสตราจารย์ ดร.ศิริลักษณ์ อุสาหะ



สำเนา

บันทึกข้อความ

ส่วนงาน คณะพยาบาลศาสตร์ งานบริการการศึกษา (บัณฑิตศึกษา) โทร. ๒๘๐๘
ที่ ศธ ๖๒๐๖/๒๖๒ค วันที่ ๑๗ ตุลาคม พ.ศ. ๒๕๖๑

เรื่อง ขอเรียนเชิญเป็นผู้ทรงคุณวุฒิแปลเครื่องมือวิจัย

เรียน ผู้ช่วยศาสตราจารย์ ดร.ยุณี พงศ์จตุรวิทย์

ด้วย นางสาวนุชรีร์ แสงสว่าง รหัสประจำตัว ๕๙๘๑๐๐๐๙ นิสิตหลักสูตรปริญญาตรีบัณฑิต สาขาพยาบาลศาสตร์ (หลักสูตรนานาชาติ) คณะพยาบาลศาสตร์ มหาวิทยาลัยบูรพา ได้รับอนุมัติเค้าโครง วิทยานิพนธ์ เรื่อง “An empirical test of a causal model of adolescent mother-grandmother attachment” โดยมีรองศาสตราจารย์ ดร. นุจรี ไชยมงคล เป็นประธานกรรมการควบคุมวิทยานิพนธ์ ซึ่งอยู่ในขั้นตอนการเตรียมเครื่องมือเพื่อการเก็บรวบรวมข้อมูล

ในการนี้ คณะฯ พิจารณาแล้วเห็นว่า ท่านเป็นผู้มีความเชี่ยวชาญ และประสบการณ์สูง จึงขอเรียนเชิญท่านเป็นผู้ทรงคุณวุฒิแปลเนื้อหาของเครื่องมือวิจัยภาษาอังกฤษเป็นภาษาไทย จำนวน ๒ ชุด ดังนี้

๑. แบบวัด Maternal Grandmother Involvement

๒. แบบวัด Relationship Quality Scale

ทั้งนี้ หากท่านมีปัญหาหรือต้องการข้อมูลเพิ่มเติม โปรดติดต่อผู้วิจัยได้ที่ โทร ๐๙ ๗๐๓๑ ๗๙๗๙

จึงเรียนมาเพื่อโปรดพิจารณาให้เกียรติเป็นผู้ทรงคุณวุฒิแปลเครื่องมือวิจัยดังกล่าวด้วย จะขอบคุณยิ่ง

(ผู้ช่วยศาสตราจารย์ ดร.พรชัย จุลเมตต์)
คณบดีคณะพยาบาลศาสตร์

ร่าง.....
พิมพ์ที่.....
ทาน..... ศศ.ดร.ตรี กิ่งใจ



ที่ ศร ๖๒๐๖/๒๖๓๖

มหาวิทยาลัยบูรพา คณะพยาบาลศาสตร์
๑๖๙ ถนนลงทาดบางแสน ตำบลแสนสุข
อำเภอมือเมือง จังหวัดชลบุรี ๒๐๑๓๑

๒๒ ตุลาคม ๒๕๖๑

เรื่อง ขออนุญาตเชิญบุคลากรในสังกัดเป็นผู้ทรงคุณวุฒิในการแปลเครื่องมือเพื่อการวิจัย
เรียน คณะบดีวิทยาลัยนานาชาติเพื่อศึกษาความยั่งยืน มหาวิทยาลัยศรีนครินทรวิโรฒ
สิ่งที่ส่งมาด้วย เครื่องมือที่ใช้ในการวิจัย

ด้วย นางสาวนุชรีย์ แสงสว่าง นิสิตหลักสูตรปรัชญาดุษฎีบัณฑิต สาขาวิชาพยาบาลศาสตร์ (หลักสูตรนานาชาติ) คณะพยาบาลศาสตร์ มหาวิทยาลัยบูรพา ได้รับอนุมัติให้ทำดุษฎีนิพนธ์ เรื่อง “An empirical test of a causal model of adolescent mother-grandmother attachment” โดยมี รองศาสตราจารย์ ดร.นุจรี ไชยมงคล เป็นประธานกรรมการควบคุมดุษฎีนิพนธ์ ซึ่งอยู่ในขั้นตอนการเตรียมเครื่องมือเพื่อการเก็บรวบรวมข้อมูล

เนื่องจาก ผู้ช่วยศาสตราจารย์กริช ราชประสิทธิ์ บุคลากรในสังกัดของท่านเป็นผู้มีความเชี่ยวชาญและประสบการณ์สูง ในกรณีนี้ คณะฯ จึงขออนุญาตเชิญเป็นผู้ทรงคุณวุฒิในการแปลเครื่องมือเพื่อการวิจัยจากภาษาไทยเป็นภาษาอังกฤษของนิสิต จำนวน ๒ เครื่องมือ ดังนี้

๑. แบบวัด The Parental Stress Scale

๒. แบบวัด The Maternal Grandmother Involvement

ทั้งนี้ หากท่านมีปัญหาหรือต้องการข้อมูลเพิ่มเติม โปรดติดต่อผู้วิจัยได้ที่ โทร ๐๙ ๗๐๓๑ ๗๙๗๙

จึงเรียนมาเพื่อโปรดพิจารณาอนุญาตด้วย จะเป็นพระคุณยิ่ง

ขอแสดงความนับถือ

(ผู้ช่วยศาสตราจารย์ ดร.พรชัย จุลเมตต์)
คณบดีคณะพยาบาลศาสตร์ ปฏิบัติการแทน
ผู้ปฏิบัติหน้าที่อธิการบดีมหาวิทยาลัยบูรพา



APPENDIX B

Permission instruments

RE: Permission to translate IPPA into Thai

G. Armsden <g.armsden@gmail.com>

พ 15/3/2017 1:07

ถึง: 'Nucharee Sangsawang' <twinnuch-swu@hotmail.com>

 สิ่งที่มา 1 รายการ (95 กิโลไบต์)
IPPA Manual 2013c.docx;

Dear Nucharee Sangsawang,

Thank you for your email. You have permission to translate the IPPA into Thai for your research. Would you kindly share your translation with me so that others may use it? I would give you credit as the translator.

Best wishes for a successful project,

Gay Armsden

From: Nucharee Sangsawang [mailto:twinnuch-swu@hotmail.com]
Sent: Friday, March 10, 2017 7:07 AM
To: g.armsden@gmail.com
Cc: Nujjaree Chaimongkol; Nucharee Sangsawang
Subject: Permission to translate IPPA into Thai

Dear Professor Dr. Armsden

I am Nucharee Sangsawang, a Ph.D student at Faculty of Nursing at Burapha University Thailand. I am now preparing a proposal aiming at determine factors predicting relationships between adolescent mothers and their parents undersupervision of Assoc. Prof. Dr. Nujjaree Chaimongkol. In this regard, I would like to ask your permission to translate the IPPA into Thai and later administer with Thai teen mothers.

Your concerns and kindness are greatly appreciated.

Sincerely yours,
Nucharee Sangsawang

10/18/2019

Mail - Nucharee Sangsawang - Outlook

Re: Request your permission to translate the Postpartum Support Questionnaire into Thai

Logsdon, M Cynthia <mimia.logsdon@louisville.edu>

พท 27/9/2018 20:37

ถึง: Nucharee Sangsawang <twinnuch-sw@hotmai.com>

You have my permission

Thank you

Sent from my iPhone

On Sep 27, 2018, at 6:41 AM, Nucharee Sangsawang <twinnuch-sw@hotmai.com> wrote:

Dear Professor Dr. Logsdon,

I am Nucharee Sangsawang, a Ph.D candidate at Faculty of Nursing at Burapha University Thailand.

I am now preparing a proposal aiming at test a causal model of attachment between adolescent mothers and their mothers (grandmother) under-supervision of Assoc. Prof. Dr. Nujjaree Chaimongkol.

In this regard, I would like to ask your permission to translate the Postpartum Support Questionnaire (PSQ) into Thai and later administer with Thai teen mothers.

Your concerns and kindness are greatly appreciated.
Sincerely yours,
Nucharee Sangsawang

10/17/2019

Mail - Nucharee Sangsawang - Outlook

RE: Request your permission to translate the measurement of maternal grandmother involvement into Thai

Barnett, Melissa A - (barnettm) <barnettm@email.arizona.edu>

a 2/10/2018 1:27

✉: Nucharee Sangsawang <twinnuch-swu@hotmail.com>

Dear Nucharee,

You are welcome to translate the measure. Good luck with your research. This sounds like a very interesting study.

Best,
Melissa Barnett

Melissa A. Barnett, Ph.D.
Fitch Nesbitt Associate Professor, Family Studies and Human Development
Norton School of Family & Consumer Sciences, College of Agriculture & Life Sciences
University of Arizona 650 N. Park Ave., P.O. Box 210078 Tucson, AZ 85721-0078
barnettm@arizona.edu Phone: (520) 621-4738
http://cals.arizona.edu/fcs/faculty/melissa_barnett

Pronouns: she/her/hers

Find my publications at [Research Gate](#) or [Google Scholar](#).

From: Nucharee Sangsawang <twinnuch-swu@hotmail.com>
Sent: Monday, October 01, 2018 10:40 AM
To: Barnett, Melissa A - (barnettm) <barnettm@email.arizona.edu>
Subject: Request your permission to translate the measurement of maternal grandmother involvement into Thai

Dear Professor Dr. Barnett

I am Nucharee Sangsawang, a Ph.D candidate at Faculty of Nursing at Burapha University, Thailand.

I am now preparing a proposal aiming at test a causal model of attachment between adolescent mothers and their mothers (grandmother) under-supervision of Assoc. Prof. Dr. Nujjaree Chaimongkol.

In this regard, I would like to ask your permission to translate the measurement of maternal grandmother involvement into Thai and later administer with Thai teen mothers.

Your concerns and kindness are greatly appreciated.
Sincerely yours,
Nucharee Sangsawang

10/17/2019

Mail - Nucharee Sangsawang - Outlook

Re: Request your permission to translate the Relationship Quality (RQ) Scale into Thai

Jill Chonody <jillchonody@boisestate.edu>

a 2/10/2018 6:58

✉: twinnuch-sw@hotmai.com <twinnuch-sw@hotmai.com>

Dear Nucharee,

Yes, of course. I hope that the instrument is useful for your study. Please let me know how it works out!

All the best,

Jill

On Mon, Oct 1, 2018 at 11:32 AM Nucharee Sangsawang <twinnuch-sw@hotmai.com> wrote:

Dear Professor Dr. Chonody

I am Nucharee Sangsawang, a Ph.D candidate at Faculty of Nursing at Burapha University Thailand.

I am now preparing a proposal aiming at test a causal model of attachment between adolescent mothers and their mothers (grandmother) under-supervision of Assoc. Prof. Dr. Nujjaree Chaimongkol.

In this regard, I would like to ask your permission to translate the Relationship Quality (RQ) Scale into Thai and later administer with Thai teen mothers.

Your concerns and kindness are greatly appreciated.

Sincerely yours,
Nucharee Sangsawang

10/17/2019

Mail - Nucharee Sangsawang - Outlook

ตอบกลับ: Request your permission to translate the Parental Stress Scale into Thai

Nucharee Sangsawang

a 9/10/2018 10:23

ถึง: judy-berry@utulsa.edu <judy-berry@utulsa.edu>

สำเนาถึง: Nujjaree Chaimongkol <nujjaree@buu.ac.th>

Dear Professor Dr. Berry

I would like to say thank you very much for your permission to use the Parental Stress scale.

Sincerely yours,

Nucharee Sangsawang

จาก: Nujjaree Chaimongkol <nujjaree@buu.ac.th>**ส่ง:** 9 ตุลาคม 2561 5:58**ถึง:** twinnuch-swu@hotmail.com**ชื่อเรื่อง:** Fwd: Request your permission to translate the Parental Stress Scale into Thai

Sent from my iPhone

Begin forwarded message:

From: "Berry, Judy" <judy-berry@utulsa.edu>**Date:** 8 October BE 2561 23:38:27 GMT+7**To:** Nujjaree Chaimongkol <nujjaree@buu.ac.th>**Subject: Re: Request your permission to translate the Parental Stress Scale into Thai**You have my permission to translate and use the Parental Stress Scale for your research.
Judy Berry

Sent from my iPhone

On Oct 8, 2018, at 8:17 AM, Nujjaree Chaimongkol <nujjaree@buu.ac.th> wrote:

- สำเนา -

ที่ ศธ ๖๒๐๖/๒๑๑๙

มหาวิทยาลัยบูรพา คณะพยาบาลศาสตร์
๑๖๙ ถนนลงหาดบางแสน ตำบลแสนสุข
อำเภอเมือง จังหวัดชลบุรี ๒๐๑๓๑

๑๙ ตุลาคม ๒๕๖๑

เรื่อง ขออนุญาตใช้เครื่องมือการวิจัย

เรียน คณบดีบัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล

ด้วย นางสาวนุชรีร์ แสงสว่าง รหัสประจำตัว ๕๙๘๑๐๐๐๙ นิสิตหลักสูตรปรัชญาดุษฎีบัณฑิต สาขาวิชาพยาบาลศาสตร์ (หลักสูตรนานาชาติ) คณะพยาบาลศาสตร์ มหาวิทยาลัยบูรพา ได้รับอนุมัติ คำโครงการดุษฎีนิพนธ์เรื่อง “An empirical test of a causal model of adolescent mother-grandmother attachment” โดยมี รองศาสตราจารย์ ดร.นุจรี ไชยมงคล เป็นประธานกรรมการ ควบคุมดุษฎีนิพนธ์ มีความประสงค์ขออนุญาตใช้เครื่องมือการวิจัย คือ The Parental Stress Scale (PSS) (แบบวัดความเครียดของผู้ดูแล) ฉบับภาษาไทย ซึ่งเป็นส่วนหนึ่งของวิทยานิพนธ์เรื่อง “ปัจจัยทำนาย พฤติกรรมการดูแลของผู้ดูแลเด็กวัยแรกเกิด-๕ ปี หลังผ่าตัดหัวใจแบบเปิด” หลักสูตรพยาบาลศาสตรมหาบัณฑิต สาขาวิชาการพยาบาลเด็ก มหาวิทยาลัยมหิดล พ.ศ. ๒๕๖๐ ของ คุณจุฑามาศ พายจะโปะ โดยมี ผู้ช่วยศาสตราจารย์ ดร.ชินฤติ คงศักดิ์ตระกูล เป็นอาจารย์ที่ปรึกษาวิทยานิพนธ์หลัก เพื่อนำมาใช้ ในการเก็บข้อมูลการทำดุษฎีนิพนธ์

จึงเรียนมาเพื่อโปรดพิจารณาอนุญาตด้วย จะเป็นพระคุณยิ่ง

ขอแสดงความนับถือ



(ผู้ช่วยศาสตราจารย์ ดร.พรชัย จุลเมตต์)
คณบดีคณะพยาบาลศาสตร์ ปฏิบัติการแทน
ผู้ปฏิบัติหน้าที่อธิการบดีมหาวิทยาลัยบูรพา

งานบริการการศึกษา (บัณฑิตศึกษา)

โทร. ๐ ๓๘๑๐ ๒๘๔๕, ๐ ๓๘๑๐ ๒๘๖๔

โทรสาร ๐ ๓๘๓๙ ๓๔๗๖

ผู้วิจัย ๐ ๙๗ ๐๓๑ ๗๙๗๙ นางสาวนุชรีร์ แสงสว่าง

ร่าง.....
พิมพ์.....
ทาน.....



ศาสตราจารย์ (ดร.วรินทร์)

คณะพยาบาลศาสตร์

26 ต.ค. 2561

160416

ศาสตราจารย์

ศาสตราจารย์

บันทึกข้อความ

ส่วนงาน มหาวิทยาลัยบูรพา คณะพยาบาลศาสตร์ งานบริการการศึกษา (บัณฑิตศึกษา) โทร.๒๘๖๔
 ที่ ศร ๖๒๐๖.๐๑/
 เรื่อง ขออนุญาตใช้เครื่องมือการวิจัย

วันที่ ๒๖ ตุลาคม พ.ศ.๒๕๖๑

เรียน คณบดีคณะพยาบาลศาสตร์

ด้วย นางสาวนุชรีย์ แสงสว่าง รหัสประจำตัว ๕๙๘๑๐๐๐๙ นิสิตหลักสูตรปรัชญาดุษฎีบัณฑิต สาขาพยาบาลศาสตร์ (หลักสูตรนานาชาติ) คณะพยาบาลศาสตร์ มหาวิทยาลัยบูรพา ได้รับอนุมัติเค้าโครงดุษฎีนิพนธ์เรื่อง “An empirical test of a causal model of adolescent mother-grandmother attachment” โดยมี รองศาสตราจารย์ ดร.นุจรี ไชยมงคล เป็นประธานกรรมการควบคุมดุษฎีนิพนธ์ มีความประสงค์ขออนุญาตใช้เครื่องมือการวิจัย เพื่อนำมาใช้ในการเก็บข้อมูลการทำ ดุษฎีนิพนธ์ คือ The Postpartum Support Questionnaire : PSQ (แบบวัดการสนับสนุนทางสังคม) ซึ่งเป็นส่วนหนึ่งของดุษฎีนิพนธ์เรื่อง “A causal model of postpartum depression and its effects on parenting roles” ของ ดร.ธัญมล สุริยานิมิตสุข หลักสูตรปรัชญาดุษฎีบัณฑิต สาขาพยาบาลศาสตร์ (หลักสูตรนานาชาติ) ปี พ.ศ. ๒๕๕๗ โดยมี รองศาสตราจารย์ ดร.วรินทร์ เดียววิเศษ เป็นอาจารย์ที่ปรึกษา ดุษฎีนิพนธ์หลัก

จึงเรียนมาเพื่อโปรดพิจารณาอนุญาตด้วย จะเป็นพระคุณยิ่ง

ดร. วรินทร์

(ผู้ช่วยศาสตราจารย์ ดร.วารี กังใจ)
 รองคณบดีฝ่ายวิจัยและบัณฑิตศึกษา

เรียน คณบดี

ด้วย นางสาวนุชรีย์ แสงสว่าง นิสิตหลักสูตรปรัชญาดุษฎีบัณฑิต สาขาพยาบาล (หลักสูตรนานาชาติ) ได้รับอนุมัติเค้าโครงดุษฎีนิพนธ์ ๑ มีความประสงค์ขออนุญาตใช้เครื่องมือการวิจัย ๑ ของ ดร.ธัญมล สุริยานิมิตสุข หลักสูตรปรัชญาดุษฎีบัณฑิต สาขาพยาบาลศาสตร์ (หลักสูตรนานาชาติ) มหาวิทยาลัยบูรพา ปี พ.ศ. ๒๕๕๗ โดยมี รศ.ดร.วรินทร์ เดียววิเศษ เป็นอาจารย์ที่ปรึกษาดุษฎีนิพนธ์หลัก เพื่อใช้ในการเก็บรวบรวมข้อมูลการทำวิทยานิพนธ์ดังกล่าว จึงเรียนมาเพื่อ

- โปรดทราบและพิจารณาอนุญาต
- เห็นควรสำเนาแจ้งรองคณบดีฝ่ายวิจัยและบัณฑิตศึกษา (ผศ.ดร. วารี กังใจ) , งานฝ่ายบัณฑิตฯ ทราบเพื่อดำเนินการตามระเบียบการขอใช้

เครื่องมือการวิจัยฯ ต่อไป

อำไพ ๒๖ ต.ค. ๖๑

- ทราบ/อนุญาต
 - มอบหมายบัณฑิตศึกษา
 ๒๖ ต.ค. ๖๑

ดร. วรินทร์

๒๖/๑๐/๖๑



APPENDIX C
instruments Thai version

สถานที่เก็บข้อมูล:



ชุดแบบสอบถามการวิจัย
เรื่อง

“การทดสอบโมเดลเชิงสาเหตุของความผูกพันรักใคร่ระหว่างมารดาวัยรุ่นและยาย”

ชุดแบบสอบถามการวิจัย

เรื่อง

“การทดสอบโมเดลเชิงสาเหตุของความผูกพันรักใคร่ระหว่างมารดาวัยรุ่นและยาย”

วัตถุประสงค์

แบบสอบถามการวิจัยเรื่อง “การทดสอบ โมเดลเชิงสาเหตุของความผูกพันรักใคร่ระหว่างมารดาวัยรุ่นและยาย” นี้จัดทำขึ้นเพื่อทดสอบโมเดลเชิงสาเหตุของความผูกพันรักใคร่ระหว่างมารดาวัยรุ่นและยาย ซึ่งผลการวิจัยจะนำไปใช้เป็นแนวทางการส่งเสริมความผูกพันระหว่างมารดาวัยรุ่นและยายต่อไป

แบบสอบถาม

แบบสอบถามมีทั้งหมด 7 ชุด คือ

- ชุดที่ 1 แบบสอบถามข้อมูลส่วนบุคคล
- ชุดที่ 2 แบบวัดสัมพันธภาพระหว่างแม่วัยรุ่น กับแม่
- ชุดที่ 3 แบบประเมินการทำหน้าที่ของครอบครัว
- ชุดที่ 4 แบบสอบถามการมีส่วนร่วมของยายในการช่วยเหลือหลาน
- ชุดที่ 5 แบบวัดความเครียดของมารดา
- ชุดที่ 6 แบบวัดการสนับสนุนทางสังคมภายหลังคลอด
- ชุดที่ 7 แบบวัดความสัมพันธ์กับสามี

การใช้แบบสอบถาม

1. ผู้ตอบแบบสอบถาม โปรดอ่านคำชี้แจงในแต่ละชุดของแบบสอบถาม และปฏิบัติตามคำชี้แจง
2. เพื่อให้ได้ข้อมูลที่ถูกต้องที่จะนำไปใช้เป็นแนวปฏิบัติส่งเสริมความผูกพันระหว่างมารดาวัยรุ่นและยายต่อไป ผู้ตอบแบบสอบถามควรเลือกคำตอบที่ตรงกับความรู้สึกท่านมากที่สุด

ผู้วิจัยขอขอบคุณล่วงหน้าที่ท่านกรุณาสละเวลา
และให้ความร่วมมือในการตอบแบบสอบถามนี้

ส่วนที่ 1 แบบสอบถามข้อมูลส่วนบุคคล

คำชี้แจง โปรดเติมข้อความลงในช่องว่าง หรือใส่เครื่องหมาย ✓ หน้าข้อความที่ตรงกับท่านมากที่สุด

1. อายุ.....ปี

2. สถานภาพการสมรส

อยู่ด้วยกันและจดทะเบียนสมรส อยู่ด้วยกันแต่ไม่จดทะเบียนสมรส

แยกกันอยู่

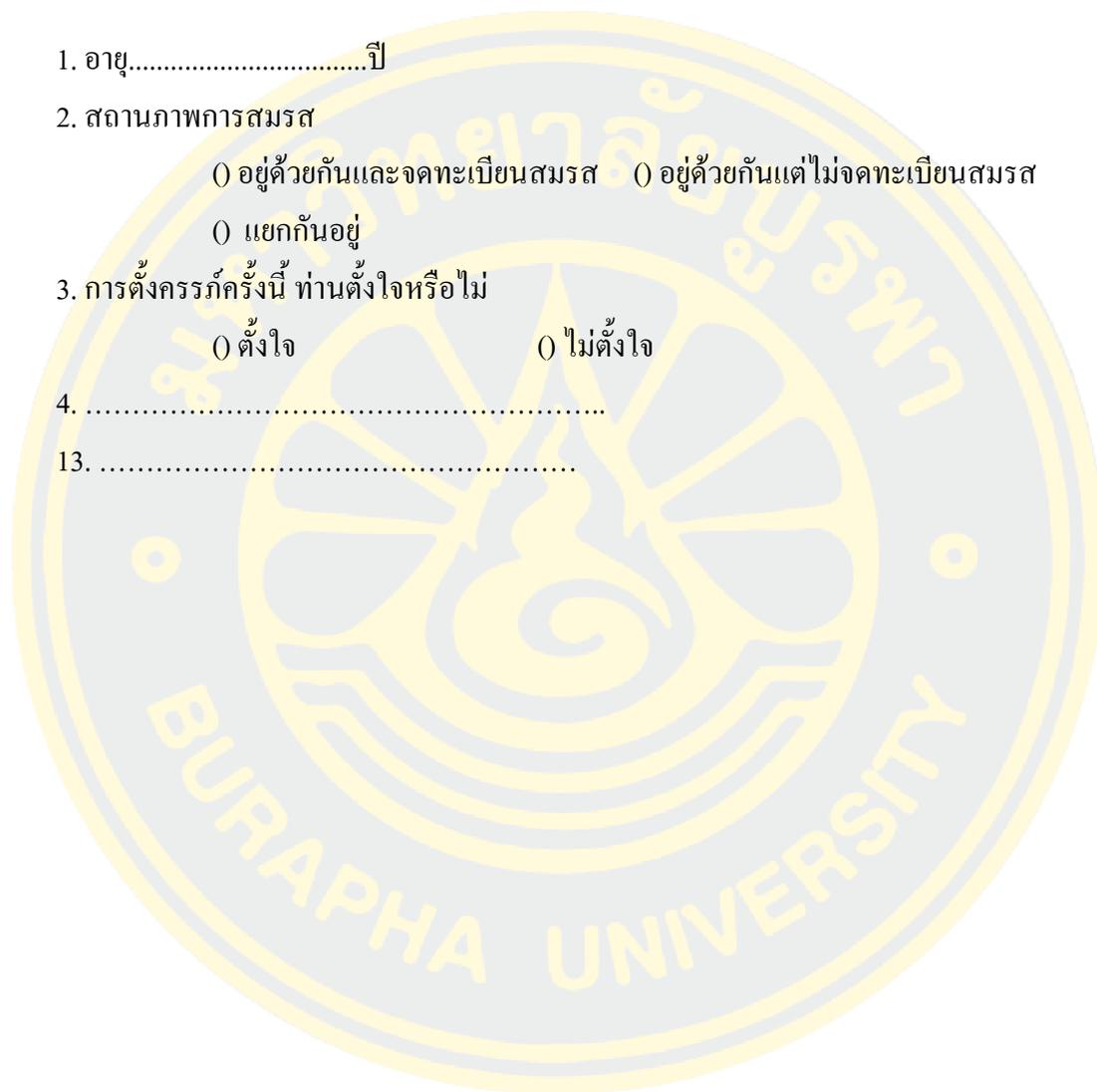
3. การตั้งครรภ์ครั้งนี้ ท่านตั้งใจหรือไม่

ตั้งใจ

ไม่ตั้งใจ

4.

13.



ส่วนที่ 2 แบบวัดสัมพันธภาพระหว่างแม่วัยรุ่น กับแม่

คำชี้แจง แบบสอบถามนี้ใช้วัดความสัมพันธ์ของท่านกับมารดาของท่าน หลังจากท่านอ่าน
ข้อคำถามแล้ว กรุณาตอบคำถามตามความเป็นจริง และทำเครื่องหมาย รอบตัวเลขที่ตรงกับ
ความคิดของคุณ มากที่สุด

ข้อคำถาม	เป็น ความ จริง เสมอ 5	เป็น ความ จริง บ่อยครั้ง 4	เป็น ความ จริง บางเวลา 3	ไม่เป็น ความ จริง บ่อยครั้ง 2	ไม่เป็น ความ จริง 1
1. แม่ให้ความสำคัญกับความรู้สึกของ ฉัน					
2. ฉันรู้สึกว่แม่ทำหน้าที่ของแม่ได้ดี					
3.					
.....					
.....					
.....					
.....					
.....					
25.					

ส่วนที่ 3 แบบประเมินการทำหน้าที่ของครอบครัว

คำชี้แจง โปรดอ่านข้อความต่อไปนี้อย่างละเอียดว่าตรงกับครอบครัวของคุณมากน้อยเพียงใด

กรุณาตอบตามความเป็นจริง และทำเครื่องหมาย รอบตัวเลขที่ตรงกับความคิดของคุณมากที่สุด

ข้อความ	ตรง มาก ที่สุด 4	ตรง ปาน กลาง 3	ตรง เล็กน้อย 2	ไม่ตรง เลย 1
1. สมาชิกในครอบครัวช่วยกันแก้ไขปัญหาส่วนใหญ่ที่เกิดขึ้นในบ้านได้				
2. มีการพูดคุยกันเสมอว่า วิธีการแก้ปัญหาที่ทำไปนั้นได้ผลหรือไม่				
3.				
.....				
.....				
.....				
.....				
36.				

ส่วนที่ 4 แบบสอบถามการมีส่วนร่วมของยายในการช่วยเหลือหลาน

คำชี้แจง แบบสอบถามนี้ใช้วัดการช่วยเหลือลูกจากมารดาของท่าน หลังจากท่านอ่านข้อคำถามแล้ว กรุณาตอบคำถามตามความเป็นจริง และทำเครื่องหมาย ✓ ลงในช่องที่ตรงกับความคิดของคุณมากที่สุด

ข้อความ	ระดับความคิดเห็น
1. แม่ของท่านมีส่วนร่วมในการเลี้ยงหลานอย่างไร
2.
3.

ส่วนที่ 5 แบบวัดความเครียดของมารดา

คำชี้แจง จงพิจารณาข้อความแต่ละข้อที่บอก ลักษณะหรือรูปแบบ ความสัมพันธ์ระหว่างท่านและบุตรในความดูแลของท่าน โดยทำเครื่องหมาย รอบตัวเลขที่ตรงกับความเห็นของท่านมากที่สุด

ข้อความ	เห็น ด้วย มาก ที่สุด 5	เห็น ด้วย มาก 4	ปาน กลาง หรือ ไม่ แน่ใจ 3	ไม่เห็น ด้วย มาก 2	ไม่เห็น ด้วย มาก ที่สุด 1
1. ฉันมีความสุขในการทำบทบาทแม่					
2. มีน้อยครั้ง หรือ ไม่มีเลยที่ฉันจะไม่ทำสิ่งต่าง ๆ ที่เห็นว่าจำเป็นสำหรับลูก					
3.					
.....					
.....					
.....					
.....					
18.					

ส่วนที่ 6 แบบวัดการสนับสนุนทางสังคมภายหลังคลอด

คำชี้แจง ในระยะหลังคลอดที่ผ่านมา ท่านได้รับการสนับสนุนและช่วยเหลือในเรื่องต่อไปนี้หรือไม่ โปรดอ่านข้อความต่อไปนี้ แล้วทำเครื่องหมาย ○ รอบตัวเลขที่ตรงกับความเห็นของท่านมากที่สุด

ข้อความ	มากที่สุด 5	มาก 4	ปานกลาง 3	เล็กน้อย 2	ไม่เคย 1
1. ฉันได้รับความช่วยเหลือเรื่องการจัดหาอาหารสำหรับครอบครัวในระหว่างที่ฉันต้องเลี้ยงลูก					
2. ฉันได้รับคำชมจากคนรอบข้างว่าฉันมีความสามารถมากกว่าการเป็นแม่คนเท่านั้น					
3.					
.....					
.....					
.....					
.....					
.....					
34.					

ส่วนที่ 7 แบบวัดความสัมพันธ์กับสามี

คำชี้แจง แบบสอบถามนี้ใช้วัดความสัมพันธ์ของท่านกับสามี หลังจากท่านอ่านข้อความแล้ว กรุณาตอบคำถามตามความเป็นจริง แล้วทำเครื่องหมาย รอบตัวเลขที่ตรงกับความเห็นของท่านมากที่สุด

ข้อความ	เห็น ด้วย มาก ที่สุด 5	เห็น ด้วย มาก 4	ปาน กลาง 3	ไม่เห็น ด้วย มาก 2	ไม่เห็น ด้วย มาก ที่สุด 1
1. ฉันพอใจในความสัมพันธ์ของเรา					
2. นี่เป็นความสัมพันธ์อย่างที่ผมเคยฝันไว้					
3.					
.....					
.....					
.....					
.....					
.....					
9.					

..... ขอขอบคุณที่ท่านให้ความร่วมมือในการตอบแบบสอบถามอย่างครบถ้วน.....



APPENDIX D

The institutional review board and permission letter for data collection



**THE INSTITUTIONAL REVIEW BOARD (IRB) FOR GRADUATE STUDIES
FACULTY OF NURSING, BURAPHA UNIVERSITY, THAILAND
(Supplement 1)**

Thesis Title An Empirical Test of A Causal Model of Adolescent Mother-grandmother Attachment

Name Miss Nucharee Sangsawang
ID: 59810009
Doctor of Philosophy in Nursing Science (International Program)

Number of the IRB approval 02 – 10 – 2561

The Institutional Review Board (IRB) for graduate study of Faculty of Nursing, Burapha University has approved the IRB number 02-10-2561 and agreed to expand the settings of data collection from 30 to 101 health promoting hospitals located in Chonburi, Chachoengsao and Rayong Province.

Date of 2nd approval: February 13rd, 2019

Chintana Wacharasin, R.N., Ph.D.

Chairperson of the IRB
Faculty of Nursing, Burapha University, THAILAND

Tel.: 66-038-102823
Fax: 66.038-393476
E-Mail: naruemit@buu.ac.th

ที่ ศธ ๖๒๐๖/ ๐๑๓๘



มหาวิทยาลัยบูรพา คณะพยาบาลศาสตร์
๑๖๙ ถนนลงหาดบางแสน ตำบลแสนสุข
อำเภอเมือง จังหวัดชลบุรี ๒๐๑๓๑

๒๐ กุมภาพันธ์ ๒๕๖๒

เรื่อง ขอความอนุเคราะห์ให้นิสิตเก็บรวบรวมข้อมูลเพื่อดำเนินการวิจัย

เรียน นายแพทย์สาธารณสุขจังหวัดชลบุรี

สิ่งที่ส่งมาด้วย ๑. ผลการพิจารณาจริยธรรมการวิจัย
๒. เครื่องมือที่ใช้ในการวิจัย

ด้วย นางสาวนุชรีย์ แสงสว่าง นิสิตหลักสูตรปรัชญาดุษฎีบัณฑิต สาขาวิชาพยาบาลศาสตร์ (หลักสูตรนานาชาติ) คณะพยาบาลศาสตร์ มหาวิทยาลัยบูรพา ได้รับอนุมัติเค้าโครงดุษฎีนิพนธ์ เรื่อง "An Empirical test of a causal model of adolescent mother-grandmother attachment" โดยมี รองศาสตราจารย์ ดร.นุจรี ไชยมงคล เป็นประธานกรรมการควบคุมดุษฎีนิพนธ์

ในการนี้ คณะฯ จึงขอความอนุเคราะห์จากท่านอำนวยความสะดวกให้นิสิตเก็บรวบรวมข้อมูลจากกลุ่มตัวอย่าง คือ มารดาวัยรุ่นที่มีอายุต่ำกว่า ๑๙ ปี คลอดบุตรเป็นครั้งแรก และอาศัยอยู่กับมารดาของตนเองในบ้านหลังเดียวกันอย่างน้อย ๖ เดือน จำนวน ๑๐๙ ราย ณ พื้นที่ของสาธารณสุขอำเภอ จังหวัดชลบุรี จำนวน ๔ อำเภอ ระหว่างวันที่ ๒๑ มีนาคม - ๓๑ กรกฎาคม พ.ศ. ๒๕๖๒ โดยกำหนดขอบเขตพื้นที่การเก็บรวบรวมข้อมูล ดังนี้

๑. สาธารณสุขอำเภอเมืองชลบุรี จำนวน ๒๕ ราย ประกอบด้วย รพ.สต.แสนสุข, รพ.สต.บ้านสวน, รพ.สต.หนองรี, รพ.สต.บ้านทองคั้ง, รพ.สต.นาป่า, รพ.สต.หนองข้างคอก, รพ.สต.ดอนหัวฬ่อ, รพ.สต.หนองไม้แดง, รพ.สต.บางทราย, รพ.สต.คลองตำหรุ, รพ.สต.เหมือง, รพ.สต.ห้วยกะปิ, รพ.สต.อ่างศิลา และรพ.สต.บ้านหัวไกรก แห่งละ ๒ ราย

๒. สาธารณสุขอำเภอบางละมุง จำนวน ๒๗ ราย ประกอบด้วย รพ.สต.บ้านโรงโป๊ะ, รพ.สต.บ้านหนองสมอ, รพ.สต.บ้านตาลหมัน, รพ.สต.ห้วยใหญ่ บ้านซากแก้ว หมู่ที่ ๑๐, รพ.สต.ตะเคียนเตี้ย, รพ.สต.บ้านห้วยใหญ่ หมู่ ๓ และรพ.สต.บ้านหนองพังแค แห่งละ ๓ ราย และรพ.สต.บ้านหนองเกตุใหญ่, รพ.สต.บ้านหนองหัวแรด, รพ.สต.โป่ง และรพ.สต.เขาไม้แก้ว แห่งละ ๒ ราย

๓. สาธารณสุขอำเภอศรีราชา จำนวน ๒๗ ราย ประกอบด้วย รพ.สต.บ้านนาพร้าว, รพ.สต.บ้านตลาดบึง, รพ.สต.บ้านหนองค้อ, รพ.สต.บ้านโค้งดารา และรพ.สต.บ้านหุบบอน แห่งละ ๓ ราย และสถานีอนามัยเฉลิมพระเกียรติ ๖๐ พรรษา นวมินทร์ราชินี, รพ.สต.บ้านตลาดล่างบางพระ, รพ.สต.บ้านห้วยกุ่ม, รพ.สต.บ้านห้วยกรู, รพ.สต.บ้านเขาหิน และรพ.สต.บ้านไร่หนึ่ง แห่งละ ๒ ราย

๔. สาธารณสุขอำเภอบ้านบึง จำนวน ๒๗ ราย ประกอบด้วย รพ.สต.บ้านหัวกุ่ม, รพ.สต.มาบไม้, รพ.สต.บ้านหนองบอนแดง, รพ.สต.บ้านหนองยาง, รพ.สต.บ้านหนองเขิน, รพ.สต.บ้านเนินโมก, รพ.สต.บ้านป่ายุบ, รพ.สต.บ้านหนองไม้แก้ว และรพ.สต.บ้านอ่างเวียน แห่งละ ๓ ราย

จึงเรียนมาเพื่อโปรดพิจารณาให้ความอนุเคราะห์ด้วย จะเป็นพระคุณยิ่ง

ขอแสดงความนับถือ

(ผู้ช่วยศาสตราจารย์ ดร.พรชัย จุลเมตต์)
คณบดีคณะพยาบาลศาสตร์ ปฏิบัติการแทน
ผู้ปฏิบัติหน้าที่อธิการบดีมหาวิทยาลัยบูรพา

งานบริการการศึกษา (บัณฑิตศึกษา)

โทรศัพท์ (๐๓๘) ๑๐๒๘๓๖, ๑๐๒๘๐๘, โทรสาร (๐๓๘) ๓๙๓๔๗๖

ผู้วิจัยโทร ๐๖-๒๕๖๕-๑๔๕๕

สำเนาเรียน สาธารณสุขอำเภอเมืองชลบุรี, สาธารณสุขอำเภอบางละมุง, สาธารณสุขอำเภอศรีราชา และสาธารณสุขอำเภอบ้านบึง

ที่ ศธ ๖๒๐๖/ ๐๑ พิธี



มหาวิทยาลัยบูรพา คณะพยาบาลศาสตร์
๑๖๙ ถนนลงทาดบางแสน ตำบลแสนสุข
อำเภอเมือง จังหวัดชลบุรี ๒๐๑๓๑

๒๐ กุมภาพันธ์ ๒๕๖๒

เรื่อง ขอความอนุเคราะห์ให้นิสิตเก็บรวบรวมข้อมูลเพื่อดำเนินการวิจัย

เรียน นายแพทย์สาธารณสุขจังหวัดฉะเชิงเทรา

สิ่งที่ส่งมาด้วย ๑. ผลการพิจารณาจริยธรรมการวิจัย
๒. เครื่องมือที่ใช้ในการวิจัย

ด้วย นางสาวนุชรี แสงสว่าง นิสิตหลักสูตรปรัชญาดุษฎีบัณฑิต สาขาวิชาพยาบาลศาสตร์ (หลักสูตรนานาชาติ) คณะพยาบาลศาสตร์ มหาวิทยาลัยบูรพา ได้รับอนุมัติเค้าโครงดุษฎีนิพนธ์ เรื่อง “An Empirical test of a causal model of adolescent mother-grandmother attachment” โดยมี รองศาสตราจารย์ ดร.นุจรีย์ ไชยมงคล เป็นประธานกรรมการควบคุมดุษฎีนิพนธ์

ในการนี้ คณะฯ จึงขอความอนุเคราะห์จากท่านอำนวยความสะดวกให้นิสิตเก็บรวบรวมข้อมูลจากกลุ่มตัวอย่าง คือ มารดาวัยรุ่นที่มีอายุต่ำกว่า ๑๙ ปี คลอดบุตรเป็นครั้งแรก และอาศัยอยู่กับมารดาของตนเองในบ้านหลังเดียวกันอย่างน้อย ๖ เดือน จำนวน ๘๕ ราย ณ พื้นที่ของสาธารณสุขอำเภอ จังหวัดฉะเชิงเทรา จำนวน ๓ อำเภอ ระหว่างวันที่ ๒๑ มีนาคม - ๓๑ กรกฎาคม พ.ศ. ๒๕๖๒ โดยกำหนดขอบเขตพื้นที่การเก็บรวบรวมข้อมูล ดังนี้

๑. สาธารณสุขอำเภอเมืองฉะเชิงเทรา จำนวน ๒๘ ราย ประกอบด้วย รพ.สต.ท่าไข่, รพ.สต.บางแก้ว, ศูนย์สุขภาพชุมชนวัดจีนประชาสโมสร, ศูนย์สุขภาพชุมชนเมืองวัดโสธรวราราม โรงพยาบาลพุทธโสธร แห่งละ ๓ ราย และ รพ.สต.คลองนา, รพ.สต.บางขวัญ, รพ.สต.วังตะเคียน, รพ.สต.โสธร, รพ.สต.หนามแดง, รพ.สต.คลองประมง, รพ.สต.คลองอุดมชลจร และรพ.สต.คลองหลวงแพ่ง แห่งละ ๒ ราย

๒. สาธารณสุขอำเภอบางน้ำเปรี้ยว จำนวน ๓๐ ราย ประกอบด้วย รพ.สต.สิงโตทอง, รพ.สต.หมอนทอง, รพ.สต.ศาลาแดง, รพ.สต.บ้านสว่างอารมณ์, รพ.สต.บึงน้ำรักษ์, รพ.สต.ดอนเกาะกา, รพ.สต.บ้านคลอง ๒๑, รพ.สต.โยธกา, รพ.สต.บ้านคลอง ๑๗ และรพ.สต.โพรงอากาศ แห่งละ ๓ ราย

๓. สาธารณสุขอำเภอนมสารคาม จำนวน ๒๗ ราย ประกอบด้วย รพ.สต.เกาะขนุน, รพ.สต.บ้านห้วยพลู, รพ.สต.บ้านหนองหว้า, รพ.สต.บ้านช่อง, รพ.สต.หนองยาว, รพ.สต.ท่าด่าน, รพ.สต.บ้านปลายกระบี่, รพ.สต.หนองแห่น และรพ.สต.เขาหินซ้อน แห่งละ ๓ ราย

จึงเรียนมาเพื่อโปรดพิจารณาให้ความอนุเคราะห์ด้วย จะเป็นพระคุณยิ่ง

ขอแสดงความนับถือ

(ผู้ช่วยศาสตราจารย์ ดร.พรชัย จุลเมตต์)
คณบดีคณะพยาบาลศาสตร์ ปฏิบัติการแทน
ผู้ปฏิบัติหน้าที่อธิการบดีมหาวิทยาลัยบูรพา

งานบริการการศึกษา (บัณฑิตศึกษา)

โทรศัพท์ (๐๓๘) ๑๐๒๘๓๖, ๑๐๒๘๐๘, โทรสาร (๐๓๘) ๓๙๓๔๗๖

ผู้วิจัยโทร ๐๖-๒๕๖๕-๑๔๕๗

สำเนาเรียน สาธารณสุขอำเภอเมืองฉะเชิงเทรา, สาธารณสุขอำเภอบางน้ำเปรี้ยว และสาธารณสุขอำเภอนมสารคาม

ที่ ศธ ๖๒๐๖/๐๑๙๐



มหาวิทยาลัยบูรพา คณะพยาบาลศาสตร์
๑๖๙ ถนนลงทาดบางแสน ตำบลแสนสุข
อำเภอเมือง จังหวัดชลบุรี ๒๐๑๓๑

๒๐ กุมภาพันธ์ ๒๕๖๒

เรื่อง ขอบความอนุเคราะห์ให้นิสิตเก็บรวบรวมข้อมูลเพื่อดำเนินการวิจัย

เรียน นายแพทย์สาธารณสุขจังหวัดระยอง

สิ่งที่ส่งมาด้วย ๑. ผลการพิจารณาจริยธรรมการวิจัย
๒. เครื่องมือที่ใช้ในการวิจัย

ด้วย นางสาวนุชรี แสงสว่าง นิสิตหลักสูตรปรัชญาดุษฎีบัณฑิต สาขาวิชาพยาบาลศาสตร์ (หลักสูตรนานาชาติ) คณะพยาบาลศาสตร์ มหาวิทยาลัยบูรพา ได้รับอนุมัติเค้าโครงดุษฎีนิพนธ์ เรื่อง “An Empirical test of a causal model of adolescent mother-grandmother attachment” โดยมี รองศาสตราจารย์ ดร.นุจรีย์ ไชยมงคล เป็นประธานกรรมการควบคุมดุษฎีนิพนธ์

ในการนี้ คณะฯ จึงขอความอนุเคราะห์จากท่านอำนวยความสะดวกให้นิสิตเก็บรวบรวมข้อมูลจากกลุ่มตัวอย่างคือ มารดาวัยรุ่นที่มีอายุต่ำกว่า ๑๙ ปี คลอดบุตรเป็นครั้งแรก และอาศัยอยู่กับมารดาของตนเองในบ้านหลังเดียวกันอย่างน้อย ๖ เดือน จำนวน ๖๐ ราย ณ พื้นที่ของสาธารณสุขอำเภอ จังหวัดระยอง จำนวน ๒ อำเภอ ระหว่างวันที่ ๒๑ มีนาคม - ๓๑ กรกฎาคม พ.ศ. ๒๕๖๒ โดยกำหนดขอบเขตพื้นที่การเก็บรวบรวมข้อมูล ดังนี้

๑. สาธารณสุขอำเภอเมืองระยอง จำนวน ๓๐ ราย ประกอบด้วย รพ.สต.บ้านหนองจอก, รพ.สต.บ้านดอน, รพ.สต.บ้านยายดา, รพ.สต.ตะพง, รพ.สต.เพ, รพ.สต.แกลง, รพ.สต.เนินพระ, รพ.สต.กะเฉด, รพ.สต.บ้านสมานมิตร, รพ.สต.ทับมา, รพ.สต.น้ำคอก, รพ.สต.มาบตาพุด, รพ.สต.บ้านยายจั่น, ศูนย์บริการสาธารณสุขเนินพะยอม และศูนย์บริการสาธารณสุขห้วยโป่ง แห่งละ ๒ ราย

๒. สาธารณสุขอำเภอแกลง จำนวน ๓๐ ราย ประกอบด้วย รพ.สต.วังหัว, รพ.สต.บ้านกะเพรา, รพ.สต.ชากพง, รพ.สต.บ้านนา, รพ.สต.บ้านเขาดิน, รพ.สต.บ้านโพธิ์ฐาน, รพ.สต.บ้านกองดิน, รพ.สต.บ้านชำสมอ, รพ.สต.คลองปูน และรพ.สต.พังราด แห่งละ ๓ ราย

จึงเรียนมาเพื่อโปรดพิจารณาให้ความอนุเคราะห์ด้วย จะเป็นพระคุณยิ่ง

ขอแสดงความนับถือ

(ผู้ช่วยศาสตราจารย์ ดร.พรชัย จุลเมตต์)
คณบดีคณะพยาบาลศาสตร์ ปฏิบัติการแทน
ผู้ปฏิบัติหน้าที่อธิการบดีมหาวิทยาลัยบูรพา

งานบริการการศึกษา (บัณฑิตศึกษา)

โทรศัพท์ (๐๓๘) ๑๐๒๘๓๖, ๑๐๒๘๐๘

โทรสาร (๐๓๘) ๓๘๓๔๗๖

ผู้วิจัยโทร ๐๖-๒๕๖๕-๑๔๕๗

สำเนาเรียน สาธารณสุขอำเภอเมืองระยอง และสาธารณสุขอำเภอแกลง



APPENDIX E

Participant's information sheet and consent form



เอกสารชี้แจง (สำหรับผู้เข้าร่วมการวิจัย)

การวิจัยเรื่อง การทดสอบ โมเดลเชิงสาเหตุของความผูกพันรักใคร่ระหว่างมารดาวัยรุ่นและยาย

รหัสจริยธรรมการวิจัย 02-10-2561

ชื่อผู้วิจัย นางสาวนุชรีย์ แสงสว่าง

การวิจัยครั้งนี้ทำขึ้นเพื่อทดสอบ โมเดลเชิงสาเหตุของความผูกพันรักใคร่ระหว่างมารดาวัยรุ่นและยาย ท่านได้รับเชิญให้เข้าร่วมการวิจัยครั้งนี้ เนื่องจากท่านเป็นผู้ที่มีคุณสมบัติตรงกับกลุ่มตัวอย่างของการศึกษานี้ เมื่อท่านเข้าร่วมการวิจัยแล้ว สิ่งที่ท่านจะต้องปฏิบัติคือ ตอบแบบสอบถามด้วยตัวของท่านเอง แบบสอบถามประกอบด้วย 1) แบบสอบถามข้อมูลส่วนบุคคล 2) แบบวัดสัมพันธภาพระหว่างแม่วัยรุ่น กับแม่ฉบับภาษาไทย 3) แบบประเมินการทำหน้าที่ของครอบครัว 4) แบบสอบถามการมีส่วนร่วมของยายในการช่วยเหลือหลาน ฉบับภาษาไทย 5) แบบวัดความเครียดของมารดา ฉบับภาษาไทย 6) แบบวัดการสนับสนุนทางสังคมภายหลังคลอด และ 7) แบบวัดความสัมพันธ์ กับสามี ฉบับภาษาไทย และ ซึ่งจะใช้เวลาทั้งสิ้นประมาณ 30-40 นาที ประโยชน์ของการวิจัยครั้งนี้อาจจะไม่ได้เป็นประโยชน์กับท่านโดยตรง แต่ผลการวิจัยจะได้รูปแบบโมเดลเชิงสาเหตุของความผูกพันรักใคร่ระหว่างมารดาวัยรุ่นและยาย เพื่อใช้ในการวิจัยครั้งต่อไป

การเข้าร่วมการวิจัยของท่านครั้งนี้เป็นไปด้วยความสมัครใจ ท่านมีสิทธิยกเลิกหรือถอนตัวออกจากโครงการวิจัยได้ตลอดเวลาโดยไม่มีผลกระทบใดๆ ทั้งสิ้น และไม่ต้องแจ้งให้ผู้วิจัยทราบล่วงหน้า ผู้วิจัยจะเก็บรักษาข้อมูลของท่านโดยใช้รหัสตัวเลขแทนการระบุชื่อ และสิ่งใดๆ ที่อาจอ้างอิงหรือทราบได้ว่าข้อมูลนี้เป็นของท่าน ข้อมูลของท่านที่เป็นกระดาษแบบสอบถามจะถูกเก็บอย่างมิดชิด และปลอดภัยในตู้เก็บเอกสารและล็อกกุญแจตลอดเวลา สำหรับข้อมูลที่เก็บในคอมพิวเตอร์ของผู้วิจัยจะถูกใส่รหัสผ่าน ข้อมูลที่กล่าวมาทั้งหมดจะมีเพียงผู้วิจัยและอาจารย์ที่ปรึกษาเท่านั้นที่สามารถเข้าถึงข้อมูลได้ ผู้วิจัยจะรายงานผลการวิจัย และการเผยแพร่ผลการวิจัยในภาพรวม สุดท้ายหลังจากผลการวิจัยได้รับการตีพิมพ์เผยแพร่ในวารสารเรียบร้อยแล้ว ข้อมูลทั้งหมดจะถูกทำลาย

หากท่านมีปัญหาหรือข้อสงสัยประการใด สามารถสอบถามได้โดยตรงจากผู้วิจัยในวันทำการรวบรวมข้อมูล หรือสามารถติดต่อสอบถามเกี่ยวกับการวิจัยครั้งนี้ได้ตลอดเวลาที่ นางสาวนุชรีย์ แสงสว่าง หมายเลขโทรศัพท์ 097-031-7979 หรือที่ รศ. ดร. นุจรี ไชยมงคล อาจารย์ที่ปรึกษาหลัก หมายเลขโทรศัพท์ 038-102-841

นางสาวนุชรีย์ แสงสว่าง

ผู้วิจัย

หากท่านได้รับการปฏิบัติที่ไม่ตรงตามที่ได้ระบุไว้ในเอกสารชี้แจงนี้ ท่านจะสามารถแจ้งให้ประธานคณะกรรมการพิจารณาจริยธรรมฯ ทราบได้ที่ เลขานุการคณะกรรมการจริยธรรมฯ ฝ่ายวิจัย คณะพยาบาลศาสตร์ มหาวิทยาลัยบูรพา โทร. 038-102823



เอกสารชี้แจง (สำหรับผู้ปกครอง)

การวิจัยเรื่อง การทดสอบ โมเดลเชิงสาเหตุของความผูกพันรักใคร่ระหว่างมารดาวัยรุ่นและยาย

รหัสจริยธรรมการวิจัย 02-10-2561

ชื่อผู้วิจัย นางสาวนุชรีร์ แสงสว่าง

การวิจัยครั้งนี้ทำขึ้นเพื่อทดสอบ โมเดลเชิงสาเหตุของความผูกพันรักใคร่ระหว่างมารดาวัยรุ่นและยาย บุตรของท่านได้รับเชิญให้เข้าร่วมการวิจัยครั้งนี้ เนื่องจากบุตรของท่านเป็นผู้ที่มีคุณสมบัติตรงกับกลุ่มตัวอย่างของการศึกษา เมื่อบุตรของท่านเข้าร่วมการวิจัยแล้ว สิ่งที่บุตรของท่านจะต้องปฏิบัติคือ ตอบแบบสอบถามด้วยตัวของบุตรของท่านเอง ซึ่งแบบสอบถามประกอบด้วย 1) แบบสอบถามข้อมูลส่วนบุคคล 2) แบบวัดสัมพันธภาพระหว่างแม่วัยรุ่น กับแม่ ฉบับภาษาไทย 3) แบบประเมินการทำหน้าที่ของครอบครัว 4) แบบสอบถามการมีส่วนร่วมของยายในการช่วยเหลือหลาน ฉบับภาษาไทย 5) แบบวัดความเครียดของมารดา ฉบับภาษาไทย 6) แบบวัดการสนับสนุนทางสังคมภายหลังคลอด และ 7) แบบวัดความสัมพันธ์ กับสามี ฉบับภาษาไทย และ ซึ่งจะใช้เวลาทั้งสิ้นประมาณ 30-40 นาที

ประโยชน์ของการวิจัยครั้งนี้อาจจะไม่ได้เป็นประโยชน์กับบุตรของท่านโดยตรง แต่ผลการวิจัยจะได้อธิบายรูปแบบโมเดลเชิงสาเหตุของความผูกพันรักใคร่ระหว่างมารดาวัยรุ่นและยาย เพื่อใช้ในการวิจัยครั้งต่อไป

การเข้าร่วมการวิจัยของบุตรของท่านครั้งนี้เป็นไปด้วยความสมัครใจ บุตรของท่านมีสิทธิยกเลิกหรือถอนตัวออกจากโครงการวิจัยได้ตลอดเวลาโดยไม่มีผลกระทบใดๆ ทั้งสิ้น และไม่ต้องแจ้งให้ผู้วิจัยทราบล่วงหน้า ผู้วิจัยจะเก็บรักษาข้อมูลบุตรของท่านโดยใช้รหัสตัวเลขแทนการระบุชื่อ และสิ่งใดๆ ที่อาจอ้างอิงหรือทราบได้ว่าข้อมูลนี้เป็นของบุตรของท่าน ข้อมูลของบุตรของท่านที่เป็นกระดาษแบบสอบถามจะถูกเก็บอย่างมิดชิด และปลอดภัยในตู้เก็บเอกสารและล็อกกุญแจตลอดเวลา สำหรับข้อมูลที่เก็บในคอมพิวเตอร์ของผู้วิจัยจะถูกใส่รหัสผ่าน ข้อมูลที่กล่าวมาทั้งหมดจะมีเพียงผู้วิจัยและอาจารย์ที่ปรึกษาเท่านั้นที่สามารถเข้าถึงข้อมูลได้ ผู้วิจัยจะรายงานผลการวิจัย และการเผยแพร่ผลการวิจัยในภาพรวม สุดท้ายหลังจากผลการวิจัยได้รับการตีพิมพ์เผยแพร่ในวารสารเรียบร้อยแล้ว ข้อมูลทั้งหมดจะถูกทำลาย

หากท่านและบุตรของท่านมีปัญหาหรือข้อสงสัยประการใด สามารถสอบถามได้โดยตรงจากผู้วิจัยในวันทำการรวบรวมข้อมูล หรือสามารถติดต่อสอบถามเกี่ยวกับการวิจัยครั้งนี้ได้ตลอดเวลาที่ นางสาวนุชรีร์ แสงสว่าง หมายเลขโทรศัพท์ 097-031-7979 หรือที่ รศ. ดร. นุจรี ไชยมงคล อาจารย์ที่ปรึกษาหลัก หมายเลขโทรศัพท์ 038-102-841

นางสาวนุชรีร์ แสงสว่าง

ผู้วิจัย

หากบุตรของท่านได้รับการปฏิบัติที่ไม่ตรงตามที่ได้รับไว้ในเอกสารชี้แจงนี้ ท่านจะสามารถแจ้งให้ประธานคณะกรรมการพิจารณาจริยธรรมฯ ทราบได้ที่ เลขานุการคณะกรรมการจริยธรรมฯ ฝ่ายวิจัย คณะพยาบาลศาสตร์ มหาวิทยาลัยบูรพา โทร. 038-102823



ใบยินยอมเข้าร่วมการวิจัย

หัวข้อวิจัย เรื่อง การทดสอบโมเดลเชิงสาเหตุของความผูกพันรักใคร่ระหว่างมารดาวัยรุ่นและยาย

วันที่ให้คำยินยอม วันที่เดือน.....พ.ศ.

ก่อนที่จะลงนามในใบยินยอมเข้าร่วมการวิจัยนี้ ข้าพเจ้าได้รับการอธิบายจากผู้วิจัยถึงวัตถุประสงค์ของการวิจัย วิธีการวิจัย ประโยชน์ที่จะเกิดขึ้นจากการวิจัยอย่างละเอียดและมีความเข้าใจดีแล้ว ข้าพเจ้ายินดีเข้าร่วมโครงการวิจัยนี้ด้วยความสมัครใจ และข้าพเจ้ามีสิทธิที่จะบอกเลิกการเข้าร่วมในโครงการวิจัยนี้เมื่อใดก็ได้ และการบอกเลิกการเข้าร่วมการวิจัยนี้ จะไม่มีผลกระทบใด ๆ ต่อข้าพเจ้า

ผู้วิจัยรับรองว่าจะตอบคำถามต่าง ๆ ที่ข้าพเจ้าสงสัยด้วยความเต็มใจ ไม่ปิดบัง ซ่อนเร้นจนข้าพเจ้าพอใจ ข้อมูลเฉพาะเกี่ยวกับตัวข้าพเจ้าจะถูกเก็บเป็นความลับและจะเปิดเผยในภาพรวมที่เป็นการสรุปผลการวิจัย

ข้าพเจ้าได้อ่านข้อความข้างต้นแล้ว และมีความเข้าใจดีทุกประการ และได้ลงนามในใบยินยอมนี้ด้วยความเต็มใจ

ลงนาม.....ผู้ยินยอม

(.....)

ลงนาม.....พยาน

(.....)

ลงนาม.....ผู้วิจัย

(นางสาว นุชรีย์ แสงสว่าง)

ในกรณีที่ผู้ถูกทดลองยังไม่บรรลุนิติภาวะ จะต้องได้รับการยินยอมจากผู้ปกครองหรือผู้แทนโดยชอบธรรม (เกี่ยวข้องกับกลุ่มตัวอย่าง.....)

ลงนาม.....ผู้ปกครอง/ ผู้แทนโดยชอบธรรม

(.....)

ลงนาม.....พยาน

(.....)

ลงนาม.....ผู้วิจัย

(นางสาว นุชรีย์ แสงสว่าง)



APPENDIX F

Evaluation of assumptions

Test of outlier

Table Appendix D-1 Univariate outlier

ID	ZATT	ZFF	ZPSS	ZSS	ZGI	ZPR
1	-0.00127	0.69016	-1.44366	-0.25034	0.13342	-0.45823
2	1.06762	0.31234	0.01827	-0.25034	0.13342	-1.65363
3	0.38048	0.46347	-0.09418	0.49834	1.27707	-0.57777
4	-0.61207	-2.18131	1.4802	-0.15675	-1.01022	-0.3387
5	0.45683	0.6146	-1.21874	-0.15675	1.27707	-0.21916
6	0.30413	0.99242	-0.54401	-0.53109	-0.4384	-0.09962
7	-0.12963	-1.45251	-0.37178	-1.48804	1.55525	-0.56637
8	0.04917	-0.84413	-0.10857	1.11494	-0.58992	0.44051
9	1.75477	1.06799	-0.20664	0.68551	1.27707	-1.17547
10	1.14397	0.76573	-1.21874	-0.39072	-0.4384	0.13946
11	1.75477	0.31234	-0.65646	-0.34392	0.13342	-0.3387
12	1.60207	1.44581	0.4681	0.31117	1.27707	-1.77317
13	1.60207	1.74807	-0.09418	0.63871	0.13342	-0.81685
14	-0.76477	1.82364	0.24319	0.96626	0.70525	-0.45823
15	1.29667	1.67251	-0.88138	0.49834	-1.01022	-0.69731
16	-0.38302	-0.51888	0.80547	-0.10996	-1.01022	-0.57777
17	0.91492	0.53903	-1.66857	0.21758	-0.4384	-0.45823
18	-2.36811	-1.50123	-0.31909	0.82588	0.13342	-0.21916
19	-1.29922	-0.97227	1.25529	-0.39072	0.70525	-0.69731
20	0.76222	1.44581	-0.31909	0.7323	-2.15386	-0.09962
21	-0.30667	-0.67001	-0.09418	0.31117	0.13342	-0.57777
22	-1.75732	-1.3501	0.13073	0.35796	-0.4384	-0.81685
23	1.06762	1.52138	0.13073	0.03041	-0.4384	0.01992
24	0.22778	-0.74558	-0.65646	0.82588	0.13342	-0.3387
25	0.60953	0.53903	0.35564	-0.71826	1.27707	0.37854
26	-0.07762	0.53903	-0.76892	-0.06317	0.70525	1.57394
27	-1.60462	0.84129	-0.99383	-0.01638	1.27707	0.259
28	-0.30667	0.16121	-0.09418	0.03041	0.70525	0.37854
29	-2.52081	-1.19897	-1.44366	-0.15675	-2.15386	-0.3387
30	-0.45937	0.08564	-1.3312	0.68551	1.27707	0.49808
31	-0.00127	-0.44332	0.4681	0.54513	1.27707	1.21532
32	-0.61207	-0.21662	-0.43155	-0.29713	-1.01022	0.49808
33	-0.15397	0.91686	-0.65646	0.45155	1.27707	0.73716
34	0.91492	-1.87905	1.81757	-0.25034	0.70525	-0.57777
35	-0.45937	-0.74558	0.69301	-0.99901	0.70525	0.259
36	1.52572	0.3879	1.14284	0.91947	1.27707	0.97624
37	-0.30667	-0.06549	-1.21874	-1.04581	0.13342	-0.57777
38	0.60953	0.69016	0.13073	0.17079	-0.4384	0.37854
39	0.60953	1.14355	-0.54401	-0.57788	1.27707	0.97624
40	1.14397	-0.14105	-0.20664	-0.29713	0.70525	-0.09962
41	-0.61207	-1.1234	0.24319	-0.39072	-0.4384	-2.01225



Table Appendix D-1 (Continued)

ID	ZATT	ZFF	ZPSS	ZSS	ZGI	ZPR
42	-0.07762	0.69016	-0.65646	0.124	-1.01022	-0.45823
43	0.15143	0.01008	0.35564	0.82588	0.13342	-1.53409
44	-0.61207	-1.27453	-1.21874	0.45155	-1.58204	-0.57777
45	0.99127	0.3879	-1.21874	0.124	-0.4384	-1.29501
46	-0.23032	-0.67001	-0.65646	-0.90543	0.70525	-0.69731
47	0.07508	-1.04784	0.4681	0.03041	0.13342	-0.21916
48	0.99127	-0.21662	-0.99383	0.35796	0.13342	-0.09962
49	-1.98636	-0.59445	-0.54401	-0.06317	1.27707	0.37854
50	-0.00127	0.3879	0.01827	0.59192	0.70525	0.37854
51	0.38048	0.31234	-0.43155	-0.71826	-1.58204	-0.45823
52	-1.37557	-0.89671	1.14284	-0.62468	1.27707	0.01992
53	0.83857	1.52138	-0.31909	-0.62468	-0.4384	0.61762
54	-0.30842	-0.84413	-0.10857	-0.04194	1.55525	0.18879
55	0.53318	-0.59445	0.01827	0.21758	-0.4384	0.8567
56	0.15143	1.59694	-0.09418	0.31117	-1.58204	-1.89271
57	-1.07017	-1.27453	0.4681	0.63871	-1.58204	-1.65363
58	-0.38302	0.16121	0.58056	-0.20355	0.70525	0.61762
59	0.76222	-0.82114	-0.43155	1.3406	1.27707	-0.69731
60	-1.91758	0.22054	-1.0298	-0.73606	-0.58992	-2.58013
61	1.60207	1.29468	1.03038	-0.25034	-0.4384	-0.21916
62	0.53318	1.29468	-0.54401	-1.18618	1.27707	0.49808
63	-0.15397	0.3879	0.24319	-1.04581	-1.58204	-0.09962
64	-0.15397	-1.57679	0.35564	0.17079	0.13342	0.37854
65	-0.48722	-1.60461	-0.50339	-0.9096	-0.58992	-0.56637
66	1.14397	-0.67001	-0.43155	0.63871	-2.72568	0.13946
67	0.22778	0.91686	-0.54401	0.35796	0.13342	1.09578
68	0.30413	0.31234	0.01827	0.91947	0.70525	-1.53409
69	-0.15397	0.6146	0.13073	1.29381	0.13342	0.97624
70	-2.63277	-0.23575	-0.50339	0.36297	-0.58992	0.18879
71	0.04917	0.37263	1.33907	0.24728	-0.58992	0.44051
72	-0.76477	-1.57679	1.03038	0.31117	-1.58204	-0.21916
73	-0.61207	-0.06549	0.69301	0.21758	-1.58204	0.01992
74	0.45683	0.69016	-0.54401	-0.57788	0.13342	-2.01225
75	0.91492	0.91686	-0.65646	-0.85864	1.27707	0.13946
76	-0.30842	-0.99623	0.54945	-0.27331	-0.58992	0.44051
77	0.53318	1.14355	-0.43155	-0.99901	1.27707	-1.29501
78	1.06762	0.53903	1.14284	-0.57788	1.27707	-0.57777
79	-0.07762	-0.14105	-0.20664	-0.95222	-1.01022	0.61762
80	-1.83367	-1.27453	0.4681	1.38739	-1.01022	-1.41455
81	-0.84112	-0.67001	1.03038	1.38739	0.13342	-1.89271
82	0.76222	0.46347	1.36775	-0.15675	-0.4384	0.37854
83	-0.61207	-0.74558	-0.31909	1.48097	-2.72568	0.01992
84	-2.13906	-0.14105	0.35564	1.05984	0.13342	0.8567

Table Appendix D-1 (Continued)

ID	ZATT	ZFF	ZPSS	ZSS	ZGI	ZPR
85	-0.61207	0.23677	1.93003	-0.29713	1.27707	0.01992
86	1.12194	-0.53994	0.28624	0.65219	-0.58992	-1.06981
87	-1.91002	-1.65236	1.70512	0.40475	-1.01022	-0.3387
88	-1.29922	-1.19897	0.4681	0.91947	-1.01022	-0.45823
89	0.91492	0.3879	-0.20664	-1.04581	1.27707	0.13946
90	0.83857	0.91686	0.13073	-1.27977	-1.01022	0.49808
91	-0.45937	-0.59445	1.70512	0.68551	-2.15386	-0.3387
92	0.94315	1.74149	-1.16141	0.88357	1.55525	-1.57325
93	-1.07017	-1.1234	-0.43155	1.15343	1.27707	-0.57777
94	-1.60462	-1.19897	-0.54401	-1.18618	-1.01022	-0.3387
95	0.60953	-0.67001	0.69301	-0.15675	0.13342	1.21532
96	0.15143	-1.1234	1.70512	-0.01638	0.70525	0.13946
97	-0.38302	0.91686	-0.09418	-0.99901	1.27707	0.73716
98	1.14397	-0.51888	1.36775	-1.27977	-1.58204	1.33486
99	-0.15397	-0.44332	0.01827	0.87268	1.27707	-0.09962
100	0.53318	-1.42566	1.36775	-1.37335	0.13342	0.37854
101	1.14397	-2.93696	0.91792	-1.56052	-0.4384	1.09578
102	0.04917	0.22054	-1.42462	0.65219	-0.58992	-0.31465
103	0.53318	0.91686	-1.21874	1.71494	-0.4384	-1.17547
104	0.94315	1.74149	0.81266	1.34632	-0.58992	1.19567
105	-0.84112	-0.36775	0.69301	1.15343	-1.58204	-2.01225
106	0.15143	0.08564	-1.3312	-0.4843	1.27707	0.73716
107	0.68587	-0.51888	0.01827	-0.10996	-1.01022	1.21532
108	-1.60462	-0.74558	-0.43155	0.26438	-0.4384	1.21532
109	0.58556	0.82892	0.94426	-1.60372	-0.58992	0.94395
110	0.30413	0.53903	0.4681	-0.10996	0.13342	0.61762
111	-0.00127	1.44581	-0.31909	0.124	0.13342	-0.81685
112	-0.61207	0.16121	-0.31909	1.62135	0.70525	0.37854
113	1.90747	2.42816	-1.66857	0.82588	1.27707	-0.3387
114	0.07508	1.06799	-0.09418	-0.76505	0.13342	-2.01225
115	0.76222	0.46347	1.25529	-0.53109	-1.58204	-0.21916
116	-0.99382	-1.1234	1.03038	1.80852	1.27707	0.97624
117	0.38048	-0.14105	0.24319	-0.99901	1.27707	-2.13179
118	-0.99382	0.23677	1.36775	-0.43751	1.27707	1.21532
119	-2.29176	-1.87905	2.15494	-0.10996	-1.01022	-0.69731
120	-0.12963	-0.23575	0.02303	0.07375	-0.58992	0.94395
121	0.15143	-1.04784	-0.88138	-0.81185	1.27707	0.61762
122	0.38048	0.01008	1.93003	-1.37335	0.13342	1.33486
123	0.60953	0.16121	-0.76892	0.87268	-0.4384	0.97624
124	-0.76477	0.16121	-0.76892	0.54513	-1.01022	1.33486
125	0.76435	0.52473	0.81266	-2.24001	0.48266	0.94395
126	0.53318	1.29468	0.80547	-0.29713	0.13342	1.4544
127	1.52572	0.46347	-0.88138	-1.0926	-1.58204	1.57394

Table Appendix D-1 (Continued)

ID	ZATT	ZFF	ZPSS	ZSS	ZGI	ZPR
128	-0.48722	-0.99623	1.73389	-0.09978	1.55525	-0.81809
129	-0.30667	1.21912	-2.00594	1.38739	-0.4384	1.4544
130	-0.84112	-1.3501	0.58056	1.80852	1.27707	0.259
131	-0.45937	-0.36775	0.24319	-0.20355	0.70525	-0.3387
132	-0.45937	-0.36775	-0.31909	1.05984	0.13342	-2.13179
133	0.53318	0.91686	-0.43155	-0.34392	-0.4384	-0.57777
134	0.60953	1.67251	-0.09418	0.124	0.13342	0.01992
135	-0.68842	0.01008	0.35564	-1.42014	1.27707	0.61762
136	0.53318	0.08564	-0.43155	0.54513	-2.72568	-0.09962
137	-0.00127	0.16121	0.01827	0.59192	-1.01022	-0.21916
138	0.60953	0.84129	-0.99383	1.76173	-0.4384	1.09578
139	-0.91747	-1.87905	1.25529	-0.20355	-2.15386	-0.45823
140	-1.29922	-0.67001	-1.10629	0.03041	-1.01022	0.8567
141	-2.27517	-2.06089	-1.0298	-0.62038	-0.58992	-2.32841
142	0.68587	-1.50123	-1.3312	1.05984	0.13342	1.33486
143	-1.07017	-0.97227	0.35564	0.54513	-0.4384	0.73716
144	0.15143	0.3879	0.4681	-0.90543	1.27707	-1.89271
145	0.99127	0.16121	-0.09418	-0.95222	0.70525	0.61762
146	1.06762	0.3879	-0.43155	1.29381	-0.4384	-0.69731
147	1.75477	0.53903	0.13073	2.04248	0.13342	-2.25133
148	-1.45192	-0.36775	0.13073	-0.34392	-1.01022	-0.69731
149	0.07508	-0.36775	-0.09418	0.35796	-1.58204	-0.3387
150	-0.53572	0.76573	0.01827	-0.29713	-0.4384	0.13946
151	0.38048	0.23677	0.24319	0.21758	-0.4384	-0.93639
152	-0.30667	-0.89671	0.01827	-0.01638	0.70525	0.73716
153	1.12194	1.89359	1.20747	-1.25666	-0.58992	1.19567
154	1.44937	1.37025	-1.10629	1.38739	-1.01022	0.49808
155	0.07508	0.76573	-1.44366	1.20022	1.27707	-2.25133
156	0.22778	0.3879	0.24319	-1.04581	-1.01022	-0.69731
157	-0.61207	-0.21662	2.15494	1.29381	0.13342	0.8567
158	-0.30667	0.16121	1.03038	-0.71826	-0.4384	1.33486
159	-1.22287	-1.87905	0.58056	-0.76505	-1.01022	-0.69731
160	0.40676	0.22054	0.15463	1.23063	-0.58992	0.44051
161	0.15143	-0.21662	0.69301	-0.53109	1.27707	-0.3387
162	-0.48722	-0.23575	-0.50339	0.76788	0.48266	-0.81809
163	-0.66601	-0.23575	0.28624	-1.25666	-0.58992	-0.56637
164	-0.15397	-1.50123	2.04249	-0.06317	0.70525	0.259
165	-0.12963	-0.23575	-1.68782	0.24728	1.55525	0.69223
166	0.68587	1.74807	-0.88138	1.20022	0.13342	-1.53409
167	1.12194	0.98102	1.07586	0.30513	-0.58992	0.44051
168	-0.38302	-0.21662	0.01827	0.96626	1.27707	0.61762
169	-0.15397	-0.51888	-0.76892	0.124	0.13342	1.33486
170	-2.13906	0.53903	-1.44366	0.35796	-1.58204	0.73716

Table Appendix D-1 (Continued)

ID	ZATT	ZFF	ZPSS	ZSS	ZGI	ZPR
171	-0.61207	1.37025	-0.65646	-0.43751	0.13342	-0.09962
172	1.22032	1.44581	-0.54401	-1.32656	0.70525	1.57394
173	-0.00127	0.31234	0.35564	0.59192	0.70525	-2.25133
174	0.91492	1.29468	-0.31909	-1.51373	0.13342	0.01992
175	0.38048	0.91686	0.24319	1.48097	-1.58204	0.73716
176	1.29667	1.74807	-1.78103	-1.32656	1.27707	1.33486
177	-0.61207	0.46347	0.69301	-1.0926	0.70525	0.61762
178	-0.66601	-0.99623	1.07586	-1.37235	0.48266	-0.31465
179	-0.99382	0.46347	-0.65646	2.08927	-0.4384	1.4544
180	-0.30667	-2.48357	0.24319	0.03041	-0.4384	0.49808
181	-1.29922	-1.1234	0.35564	0.40475	-1.01022	-0.57777
182	-0.00127	0.99242	-1.10629	1.43418	1.27707	1.57394
183	0.04917	0.06844	-0.8982	-0.389	1.55525	-1.32153
184	1.37302	1.14355	-1.44366	-1.18618	-2.15386	0.97624
185	1.37302	-0.97227	0.35564	1.05984	0.13342	-0.3387
186	-2.99036	-2.06089	-0.8982	-0.21547	0.48266	-1.32153
187	1.83112	1.21912	-0.88138	1.10664	0.70525	-1.89271
188	0.45683	-1.19897	0.91792	-0.53109	-1.01022	1.33486
189	1.12194	-0.53994	0.41784	1.34632	0.48266	0.44051
190	-0.99382	-1.42566	1.59266	0.35796	0.13342	-2.25133
191	0.60953	0.53903	0.58056	1.52777	1.27707	-2.13179
192	0.38048	-0.82114	-0.88138	0.17079	-0.4384	-1.89271
193	-0.84112	-0.97227	1.03038	0.91947	-1.01022	0.01992
194	0.76435	0.82892	1.33907	-0.09978	-0.58992	0.94395
195	1.14397	0.99242	-0.54401	1.29381	-0.4384	0.8567
196	0.58556	0.82892	1.20747	1.75123	-1.66251	0.94395
197	0.76435	0.67683	1.73389	-0.50469	1.55525	1.19567
198	-0.23032	0.3879	-1.3312	-1.18618	0.70525	0.01992
199	0.58556	0.52473	0.15463	0.82572	0.48266	-0.06293
200	0.04917	0.22054	0.02303	-1.89294	-1.66251	0.18879
201	-1.37557	0.6146	0.01827	-0.34392	0.70525	-2.01225
202	-0.53572	-0.14105	0.35564	-0.67147	0.70525	0.97624
203	1.29667	1.21912	2.15494	0.68551	0.70525	1.57394
204	-0.48722	-0.08365	-0.37178	0.24728	-0.58992	-0.06293
205	0.30413	-1.19897	-0.54401	0.31117	1.27707	0.01992
206	0.30413	0.99242	-0.20664	0.07721	-0.4384	1.4544
207	-1.83367	-0.74558	1.4802	0.07721	-1.58204	0.97624
208	0.30413	0.23677	-0.65646	-0.57788	0.13342	-0.21916
209	0.83857	1.14355	-0.65646	1.57456	0.70525	1.33486
210	0.07508	-0.29219	0.91792	0.96626	0.70525	-1.29501
211	0.45683	0.76573	0.80547	1.76173	0.13342	0.8567
212	0.45683	-0.36775	-0.20664	-0.15675	-0.4384	1.33486
213	0.53318	0.08564	0.91792	0.21758	1.27707	-0.21916

Table Appendix D-1 (Continued)

ID	ZATT	ZFF	ZPSS	ZSS	ZGI	ZPR
214	-0.53572	-0.29219	-0.76892	0.21758	-0.4384	1.21532
215	0.53318	-0.06549	1.4802	-1.04581	0.13342	0.8567
216	-0.12963	-1.45251	-1.16141	0.5365	-0.58992	0.69223
217	1.83112	1.82364	1.59266	0.49834	0.13342	0.61762
218	-0.99382	-0.74558	0.13073	-0.39072	0.13342	1.21532
219	0.38048	1.14355	-0.99383	1.62135	0.13342	1.09578
220	0.60953	1.21912	-1.10629	0.7323	-0.4384	-2.25133
221	0.68587	0.84129	-0.99383	1.01305	1.27707	0.49808
222	0.40676	0.67683	1.07586	-1.3145	-1.66251	0.44051
223	0.94315	1.74149	0.68105	0.5365	1.55525	-1.82497
224	-0.30667	-0.21662	-0.65646	-1.46694	1.27707	0.01992
225	-1.14652	0.23677	0.24319	-1.46694	1.27707	0.13946
226	1.37302	1.52138	-0.54401	0.124	0.70525	-0.21916
227	-1.07017	0.76573	-0.65646	1.29381	0.70525	1.09578
228	0.68587	-2.40801	0.91792	-0.15675	-1.01022	-0.3387
229	-0.61207	-0.06549	0.69301	1.85531	-1.58204	0.01992
230	-0.76477	-1.1234	1.25529	1.71494	0.13342	0.37854
231	0.40676	0.37263	-1.55622	1.17279	-0.58992	1.19567
232	0.76435	0.52473	-1.42462	0.42081	-0.58992	0.69223
233	-2.52081	-1.19897	-1.44366	-0.06317	-1.58204	-0.45823
234	0.76435	-0.23575	-1.55622	0.36297	0.48266	0.94395
235	1.60207	0.69016	-0.76892	0.91947	1.27707	1.4544
236	-0.12963	0.67683	-0.63499	1.23063	1.55525	-0.06293
237	0.38048	1.14355	-1.10629	1.76173	1.27707	1.21532
238	0.45683	0.01008	0.80547	0.96626	-0.4384	-0.21916
239	-1.60462	-0.97227	-0.31909	-1.37335	0.13342	-0.09962
240	-0.00127	0.08564	-1.3312	-0.4843	0.70525	1.57394

Table Appendix D-2 Multivariate outlier

ID	P_MAH	ID	P_MAH	ID	P_MAH	ID	P_MAH
1	0.8233	43	0.7795	85	0.3242	127	0.152
2	0.6155	44	0.2932	86	0.1019	118	0.2479
3	0.8826	45	0.5693	87	0.4017	119	0.1986
4	0.4028	46	0.7369	88	0.7299	120	0.9612
5	0.7869	47	0.9363	89	0.782	121	0.3416
6	0.922	48	0.7864	90	0.5381	122	0.2169
7	0.2804	49	0.2506	91	0.2354	123	0.8647
8	0.7561	50	0.9744	92	0.0823	124	0.5991
9	0.369	51	0.6405	93	0.3246	125	0.2573
10	0.8179	52	0.5462	94	0.3861	126	0.4147
11	0.6347	53	0.6992	95	0.7326	127	0.152
12	0.1819	54	0.6876	96	0.5546	118	0.2479
13	0.4887	55	0.897	97	0.5638	119	0.1986
14	0.1464	56	0.0877	98	0.0913	120	0.9612
15	0.4446	57	0.3716	99	0.7802	121	0.3416
16	0.929	58	0.9383	100	0.3322	122	0.2169
17	0.6788	59	0.2318	101	0.0014	123	0.8647
18	0.2416	60	0.061	102	0.766	124	0.5991
19	0.7208	61	0.3526	103	0.4102	125	0.2573
20	0.1992	62	0.6137	104	0.4815	126	0.4147
21	0.9809	63	0.5651	105	0.2226	127	0.152
22	0.6515	64	0.7235	106	0.6154	128	0.1416
23	0.7182	65	0.5751	107	0.6997	129	0.1703
24	0.8036	66	0.0748	108	0.5214	130	0.1851
25	0.8477	67	0.9037	109	0.6073	131	0.9872
26	0.7142	68	0.6965	110	0.9738	132	0.4061
27	0.1687	69	0.7289	111	0.7195	133	0.9253
28	0.9879	70	0.0262	112	0.6327	134	0.7706
29	0.0231	71	0.8453	113	0.203	135	0.5791
30	0.5363	72	0.5928	114	0.3656	136	0.2047
31	0.6054	73	0.7381	115	0.3397	137	0.9617
32	0.917	74	0.475	116	0.1212	138	0.5202
33	0.7156	75	0.7883	117	0.2841	139	0.2752
34	0.0765	76	0.8866	118	0.2479	140	0.4889
35	0.8904	77	0.4943	119	0.1986	141	0.1682
36	0.2138	78	0.5312	120	0.9612	142	0.0599
37	0.6984	79	0.8661	121	0.3416	143	0.8646
38	0.9738	80	0.2798	122	0.2169	144	0.4075
39	0.722	81	0.3475	123	0.8647	145	0.8502
40	0.8444	82	0.6571	124	0.5991	146	0.7162
41	0.4913	83	0.1528	125	0.2573	147	0.0374
42	0.8687	84	0.2033	126	0.4147	148	0.7184

Table Appendix D-2 (Continued)

ID	P_MAH	ID	P_MAH	ID	P_MAH	ID	P_MAH
149	0.8217	175	0.3371	201	0.1967	227	0.2921
150	0.8788	176	0.1774	202	0.8735	228	0.067
151	0.9574	177	0.6731	203	0.026	229	0.3488
152	0.8783	178	0.6471	204	0.9918	230	0.4006
153	0.3452	179	0.164	205	0.3871	231	0.4207
154	0.421	180	0.2075	206	0.7449	232	0.5656
155	0.0993	181	0.8168	207	0.2014	233	0.0446
156	0.7422	182	0.2462	208	0.9862	234	0.4236
157	0.1768	183	0.5942	209	0.4577	235	0.3417
158	0.6217	184	0.0655	210	0.6545	236	0.4791
159	0.5522	185	0.2707	211	0.394	237	0.2673
160	0.9078	186	0.1394	212	0.8521	238	0.8765
161	0.8707	187	0.1579	213	0.7915	239	0.5036
162	0.9586	188	0.4001	214	0.8319	240	0.5332
163	0.8861	189	0.4197	215	0.5754		
164	0.3629	190	0.2425	216	0.4756		
165	0.2493	191	0.1408	217	0.0666		
166	0.3187	192	0.2831	218	0.8021		
167	0.8751	193	0.7725	219	0.5349		
168	0.7096	194	0.8864	220	0.2036		
169	0.7877	195	0.691	221	0.6967		
170	0.0341	196	0.2121	222	0.5179		
171	0.572	197	0.2295	223	0.0797		
172	0.3681	198	0.6361	224	0.5838		
173	0.4112	199	0.9748	225	0.4153		
174	0.618	200	0.308	226	0.801		

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