

SEVERITY OF PREGNANCY PERIOD DISCOMFORTS DOES IT PREDICT POSTPARTUM DEPRESSION AND MATERNAL ATTACHMENT?

Hülya Arslantaş¹, Ayden Çoban², İ.Ferhan Dereboy³,
Muazzez Şahbaz¹, Ezgi Sari¹, Döndü Kurnaz⁴,

¹ Adnan Menderes University, Nursing Faculty, Aydin TURKEY,

² Adnan Menderes University, Faculty of Health Science, Aydin TURKEY,

³ Adnan Menderes University, Medical Faculty, Aydin TURKEY,

⁴ Ministry of Health Public Hospitals Union Aydin Maternity and Pediatrics Hospital Polyclinics, Aydin TURKEY,

Correspondent author: Hülya Arslantaş, hulyaars@yahoo.com

Abstract:

This study was conducted as a follow-up research to determine if severity of pregnancy period discomforts predicts postpartum depression and maternal attachment or not.

The study was planned as a follow-up research in Aydin, Turkey this study was carried out between November 17, 2014 and September 23, 2017 in the gynecology department of a university research and practice hospital and the gynecology and pediatrics clinics of a state hospital, both located in the western region of Turkey.

The study was conducted in two interview phase with 493 pregnant women in the first interview; 171 first trimester, 159 second trimester, 163 third trimester respectively. After their delivery; 229 postpartum women were included to second interview phase; 83 first trimester postpartum women, 74 second trimester postpartum women, 72 third trimester postpartum women respectively. While choosing those women draw method was applied and they were reached via phone 4-6 weeks after the delivery. In data collection, for the first interview "Sociodemographic and Clinical Information Form" and "Scale for Pregnancy Related Discomforts-SPRD" were applied to all the pregnant women, for the women in second interview "Edinburg Postpartum Depression Scale" and "Maternal Attachment Inventory" were used.

When relation between prenatal and postpartum period total scale scores of women participated in the research were examined; no relation was found between total SPRD scores of first, second, third trimesters and postpartum depression scores ($r=0.143$; $r=0.060$; $r=0.066$; $p>0.05$, respectively). There was a low and positive relation between first trimester SPRD total scores and maternal attachment score ($r=0.265$; $p<0.05$); and no relation was found between second and third trimester SPRD total scores and maternal attachment ($r=0.053$; $r=-0.013$; $p>0.05$, respectively). Discomfort severity related to pregnancy did not predict postpartum depression; first trimester discomforts related to pregnancy predicted maternal attachment in a very low level but second and third trimester discomforts did not predict maternal attachment.

Key-words: *severity of pregnancy period discomforts, postpartum depression, maternal attachment*

Introduction

Women can experience one or more discomforts in a wide variety during pregnancy period. All pregnancies are different from each other. A discomfort perceived during one pregnancy may not be perceived in another. It is considered that the most common discomfort experience results from hormonal changes. Other problems occurring as pregnancy progresses, can be attributed to physical changes related to uterus expanding [13]. In parallel with physical situation related to pregnancy period and changes in endocrine system, the most encountered physical and emotional discomforts during pregnancy include; polyuria, nausea and

vomiting, increased/ decreased appetite, epigastric burning, olfactory sensitivity, constipation, diarrhea, hemorrhoids, varicosis and edema, muscle cramps, low back pain, headache, fatigue, weakness, distress and insomnia [13, 42]. A lot of women experience discomfort related to pregnancy and in addition to this they experience restriction in their activities [41].

In their research of Chou et al. [8], conducted with 113 participants to investigate psychosocial factors related to nausea, vomiting and fatigue in early period of pregnancy; 26.5% of the participants did not experience discomfort, 38.1% experienced rarely, 35.4%

reported frequently nausea and vomiting. 3.5% of the women never experienced fatigue, 43.4% experienced fatigue rarely, and 53.1% reported that they experienced fatigue frequently in the previous month. In their research of Nazik and Eryılmaz [31] conducted among pregnant women to investigate incidence of discomfort related to pregnancy and to determine their approaches in managing those discomforts; the most recorded discomforts in first trimester were nausea-vomiting (87.8%), fatigue (77.9%) and breast tenderness (76.2%); and for the second and third trimesters were polyuria (79.9%-88.4%), fatigue (75.6%-88.4%) and epigastric burning (71.3%-81.8%), respectively. In a study of Davis [13] which was conducted to list pregnancy symptoms; 45.5% of the women experienced fatigue frequently; 27.5% poor sleep quality; 19.5% low back pain; 12.6% nausea respectively. 16.2% sometimes or frequently had difficulty in urinary continence.

While many women comply with physical, psychological and social changes occurring as a result of pregnancy and delivery; in some other women it may cause mental diseases in mild, moderate and severe levels. Postpartum mental disorders can be encountered in three different ways such as maternity blues, postpartum depression and postpartum psychosis. Of those disorders, postpartum depression starts between 4-6 weeks and it is characterized with symptoms like uneasiness, depressive mood, feeling guilty, fatigue, anxiety, sleep disorders, attention lose, suicide thoughts, and other somatic symptoms [14, 20, 23]. In their study to investigate obstetric, somatic, and demographic risk factors for postpartum depressive symptoms, Josefsson et al. [21] found that the strongest risk factors for postpartum depressive symptoms were sick leave during pregnancy and a high number of visits to the antenatal care clinic. Complications during pregnancy, such as hyperemesis, premature contractions, and psychiatric disorder were more common in the postpartum depressed group of women. In their study no association was found between parity, sociodemographic data or mode of delivery and postpartum depressive symptoms.

Bowlby [6] defined maternal attachment as existence of a close, sustained and warm relation between mother and child; and

satisfaction and taking pleasure of both two of them [6, 7]. Maternal attachment is a specific and unique relation [4, 43]. In some studies it was stated that prenatal and postnatal maternal attachment were related to each other [3, 17, 28]. Mother-baby attachment process develops during pregnancy, delivery and postpartum periods [4, 43]. Pregnancy and postpartum period can cause tendency for development of mental disorders [15]. Maternal stress in pregnancy and postpartum period can effect postpartum maternal attachment [15, 18, 34, 35, 44] and mental development of infants negatively [15, 24]. It was reported that early period maternal attachment was found as main predictor of attachment in first year after delivery [33]. In postpartum period mental disorders can occur even without an attachment disorder [39]. In their study to investigate association of prenatal, natal, and postnatal factors with maternal attachment; Mutlu et al. [30] found that having a baby for the first time, can be seen as one of the most important factors affecting attachment of mothers defining no mental health problems between the first and fourth months after birth. Mother baby interaction during postpartum period should be supported as much as possible [4, 43].

Prevention and early intervention strategies would benefit from an understanding of the influence of both prenatal and postpartum maternal distress on a broader spectrum of infant developmental outcomes. Although studies investigating the relation between mother baby attachment and postpartum depression exist in international literature [15, 26, 27, 35-37] no study was encountered which investigates severity of pregnancy period discomforts in predicting postpartum depression and maternal attachment. Therefore this study was conducted to determine if severity of pregnancy period discomforts predict postpartum depression and maternal attachment or not.

Within this context, the research question was "Does severity of pregnancy period discomforts predict postpartum depression and maternal attachment or not?"

Materials and Methods

The study was planned as a follow-up research. This study was carried out between

November 17, 2014 and September 23, 2017 in the gynecology department of a university research and practice hospital and the gynecology and pediatrics clinics of a state hospital, both located in the western region of Turkey. The study was conducted in two interview phase with 493 pregnant women in the first interview; 171 first trimester, 159 second trimester, 163 third trimester respectively. While determining number of women for follow up in second interview, it was decided to include 50 women for each trimester when power was taken as Power= .80; Alpha= .05; d= .50 in Cohen's d table, which Cohen suggests to calculate minimum number of person in each group for situations to make comparisons between two groups [9]. But, possible losses were considered and it was decided to include %70 more person for each group and total number of women was calculated as 255. While choosing those women draw method was applied and they were reached via phone 4-6 weeks after the delivery. 229 postpartum women were included to second interview phase after their delivery; 83 first trimester postpartum women, 74 second trimester postpartum women, 72 third trimester postpartum women respectively. In data collection, for the first interview "Sociodemographical and Clinical Information Form" and "Scale for Pregnancy Related Discomforts-SPRD" were applied to all the pregnant women, for the women in second interview "Edinburg Postpartum Depression Scale" and "Maternal Attachment Inventory" were used.

Data Collection

Socio-demographical Information Form: It consists of 6 questions related to socio-demographical characteristics of mothers and their husbands.

Scale for Pregnancy-Related Discomforts (SPRD): Scale for Pregnancy Related Discomforts (SPRD) was developed by Shinkawa et al. [40] and consists of 41 items. Answers are categorized with numbers from 0 to 5 and are a six point Likert scale. Five means "every time" and 0 means "never". Scale evaluates pregnancy discomforts in the last one week in terms of trimesters. The first trimester discomforts part of the scale includes 3

subscales. "Morning-sickness-like syndrome" subscale includes 5 questions, and "Constipation-associated syndrome" subscale includes 3 questions and "Social-activity-restricting syndrome" includes 7 questions. The second trimester discomforts part of the scale includes 3 subscales. "Fetal-growth-related syndrome" subscale includes 6, "Negative mental syndrome" subscale includes 4 and "Constipation-associated syndrome" subscale includes 3 questions. The last trimester discomforts part of the scale includes 2 subscales. "Lifestyle-influencing syndrome" includes 9, and "Musculoskeletal syndrome" includes 4 questions. While minimum score for the scale is 0; maximum score for first, second and third trimesters are 75, 65, and 65 respectively. The Cronbach's alpha coefficient of the global scale in each trimester ranged from 0.82 to 0.85, and that of the subscale ranged from 0.72 to 0.84, confirming the internal consistency. In our study, the Cronbach's alpha coefficient of the global scale in each trimester ranged from 0.80 to 0.82 and that of the subscale ranged from 0.63 to 0.89, confirming the internal consistency. Higher scores indicate higher number of symptoms and severity of pregnant women [11].

Edinburgh Postnatal Depression Scale (EPDS): EPDS was developed by Cox, Holden, and Sagovsky [10] to screen the risk of postpartum depression. The scale was not directed toward making the diagnosis of depression. It is a four-point self-reported scale composed of ten items. Responses are scored from 0 to 3. The lowest and the highest scores to be obtained from the scale are 0 and 30 respectively. Items 1, 2 and 4 are scored from 0 to 3, but items 3, 5, 6, 7, 8, 9 and 10 are scored in the reverse order. EPDS was adapted into Turkish culture by Engindeniz [16]. In the study testing validity and reliability of the scale by Engindeniz, the internal consistency coefficient of the scale was 0.79, the split-half reliability was 0.80, the sensitivity was 0.84, the specificity was 0.88, the positive evaluation value was 0.69 and the negative evaluation value was 0.94 when the cut-off point was considered as 12/13. The correlation between EPDS and General Health Questionnaire was $r = 0.7$. The cut-off value for the scale was considered as 12/13 and the women having 12 or higher scores were

considered at risk. In addition, analyses of the EPDS scores were performed on the total scale score of women in this study. It is recommended in Postpartum Care Guidelines issued by the Turkish Ministry of Health that EPDS should be used routinely in identifying of women at risk of PPD [38]. In the current study Cronbach's alpha coefficient was found 0.83.

Maternal Attachment Inventory (MAI): The MAI was developed by Muller in 1994 in order to measure maternal affectionate attachment [29]. The reliability coefficient of MAI was determined to be Cronbach Alpha 0.85 in the first month postpartum, Cronbach Alpha = 0.76 in the fourth month postpartum and Cronbach Alpha = 0.85 in the eighth month postpartum. The validity and reliability study of the Turkish version of the inventory was conducted by Kavlak and Sirin with 165 mothers of healthy babies. In the study by Kavlak and Sirin [22] the reliability coefficient of MAI was determined to be Cronbach Alpha = 0.77 in the first month postpartum and Cronbach Alpha = 0.82 in the fourth month postpartum. Since MAI is a self-applicable scale, it can be carried out with literate women who are able to comprehend what they are

reading. It is a four-point Likert-type scale of 26 items, each of which ranges from 'always' to 'never'. The lowest point obtainable from the scale is approximately 26 whereas the highest point varies around 104. In the current study Cronbach's alpha coefficient was found 0.83.

Ethical consideration

Our study was approved by the Non Invasive Clinical Research Ethics Committee of Adnan Menderes University (date 2014/473, reference number B.30.2.ADU.56989545/050.04-290). Mothers who participated in our study volunteered and signed a written consent before the research.

Statistical analysis

The data were evaluated by using SPSS-18.0/Windows®. In descriptive statistics percentage, mean ± standard deviation were used. While searching for relation between scales, correlation analyses was used.

Results

The socio-demographical characteristics of mothers participated into the study and their husbands are presented in Table 1.

	1st Trimester		2nd Trimester		3rd Trimester	
	n	%	n	%	n	%
	83	36.2	74	32.3	72	31.4
Age of the women	$\bar{x} \pm sd$		$\bar{x} \pm sd$		$\bar{x} \pm sd$	
	26.13±6.02		25.36±5.13		26.22±5.07	
Profession of the women						
Civil-servant	3	3.6	5	6.8	6	8.3
Worker	10	12	2	2.7	2	2.8
House-wife	64	77.1	58	78.4	60	83.3
Independent business	3	3.6	3	4.1	1	1.4
Student	-	-	1	1.4	-	-
Other	3	3.6	5	6.8	3	4.2
Educational status of the women						
Not literate	4	4.8	1	1.4	-	-
Literate	3	3.6	6	8.1	2	2.8
Primary school	20	24.1	10	13.5	23	31.9
Secondary school	34	41	30	40.5	22	30.6
High School	13	15.7	12	16.2	15	20.8
University/college	9	10.8	15	20.3	10	13.9

Profession of the husbands						
Civil-servant	8	9.6	9	12.2	6	8.3
Worker	24	28.9	22	29.7	36	50.0
Independent business	34	41.0	31	41.9	18	25.0
Student	2	2.4	2	2.7	1	1.4
Other	15	18.1	10	13.5	11	15.3
Educational status of the husbands						
Not literate	-	-	1	1.4	-	-
Literate	1	1.2	4	5.4	1	1.4
Primary school	19	22.9	10	13.5	22	30.6
Secondary school	29	34.9	21	28.4	22	30.6
High School	19	22.9	25	33.8	15	20.8
University/college	15	18.1	13	17.6	12	16.7
Income level of the family						
Income is less than expenditure	19	22.9	20	27.0	16	22.2
Income is more than expenditure	1	1.2	-	-	4	5.6
Income is equal to expenditure	63	75.9	54	73.0	52	72.2

Table 1. The distribution of socio-demographical characteristics of mothers participated into the study and their husbands

When relation between prenatal and postpartum period total scale scores of women participated in the research were examined; no relation was found between total SPRD scores of first, second, third trimesters and postpartum depression scores ($r=0.143$; $r=0.060$; $r=0.066$; $p>0.05$, respectively). There was a low and

positive relation between first trimester SPRD total scores and maternal attachment score ($r=0.265$; $p<0.05$); and no relation was found between second and third trimester SPRD total scores and maternal attachment ($r=0.053$; $r=-0.013$; $p>0.05$, respectively) (Table 2).

SCALES	EPDS***	MAI****
1st Trimester SPRD Total Score**	0.143	0.265*
2nd Trimester SPRD Total Score**	0.060	0.053
3rd Trimester SPRD Total Score**	0.066	-0.013

* $p<0.05$; ****SPRD**: Scale for Pregnancy Related Discomforts; *****EPDS**: Edinburg Postpartum Depression Scale; ******MAI**: Maternal Attachment Inventory

Table 2. The relation between pregnancies related discomforts and Edinburgh Postnatal Depression and Maternal Attachment levels of the women

Discussion

When relation between prenatal and postpartum period total scale scores of women participated in the research were examined; no relation was found between total SPRD scores of first, second, third trimesters and postpartum depression scores. There was a low and positive relation between first trimester SPRD total scores and maternal attachment score; and no relation was found between second and third trimester SPRD total scores and maternal

attachment. This reason can be due to the causes of biological and psychosocial risk factors which are blamed the postpartum depression has not yet been fully clarified. It has been reported that irregularities of brain specific chemical agents known as neurotransmitters cause to depression development. Sudden drop of high estrogen and progesterone levels observed during the period of pregnancy is considered to be an important factor in the etiology of postpartum depression. There should be a

possible link among the psychiatric symptoms and the changes in cortisol and thyroxin level in the postnatal period [1, 2, 5, 19, 32]. Although endocrine and biochemical changes occur in all women who give birth, some of them may develop psychiatric disorders. For this reason, social stress factors, interpersonal relationships, factors such as social support systems are suggested a need to be taken into consideration. Moreover, social environment factors which shape the experience of pregnancy such as familial, cultural, religious, social, economic, political and intellectual conditions can effect postpartum depression. It is difficult for women who are not emotionally supported, to constitute a healthy communication with their babies [12,21,25]. In this study no significant relation was found between pregnancy period discomforts and maternal attachment. The reason why no difference found in prenatal factors in terms of maternal attachment can result from that maternal lovingly bonding process cannot be significantly affected by adverse conditions other than mental health problems [30]. At this point, both midwives and gynecology-obstetric nurses should work better. We hope a lot of problem will be solved, if midwives and gynecology-obstetric nurses who are sensitive at this subject consider the women with this perspective at the postpartum period.

Conclusion

Discomfort severity related to pregnancy did not predict postpartum depression; first trimester discomforts related to pregnancy predicted maternal attachment in a very low level but second and third trimester discomforts did not predict maternal attachment.

Bibliografie:

- [1] Ahokas A, Kaukoranta J, Aito M. Effect of estradiol on postpartum depression. *Psychopharmacology*. 1999; 146:108-10.
- [2] Akkaya C. Serotonin and noradrenalin in the etiology of depression. *Yeni Symposium*. 2005; 43:91-6.
- [3] Alhusen JL. A literature update on maternal-fetal attachment. *J Obstet Gynecol Neonatal Nurs*. 2008; 37:315-28.

- [4] Ard NC. Prenatal and postnatal attachment in adolescent mothers. *J Child Fam Nurs*. 2000; 3:313-25.
- [5] Bloch M, Daly RC, Rubinow DR. Endocrine factors in the etiology of postpartum depression. *Compr Psychiatry*. 2003; 44:234-46.
- [6] Bowlby J. *Child Care and The Growth of Love*, Penguin Books, New York. 1965.
- [7] Bretherton I. The origins of attachment theory: John Bowlby and Mary Ainsworth. *Dev Psychol*. 1992; 28:759-75.
- [8] Chou FH, Lin LL, Cooney AT, Walker LO, Riggs MW. Psychosocial factors related to nausea, vomiting, and fatigue in early pregnancy. *Journal of Nursing Scholarship*. 2003; 35: 119-25.
- [9] Cohen J. *Statistical power analysis for the behavioral sciences*. Second ed. Hillsdale, New Jersey, Lawrence Erlbaum, 1988.
- [10] Cox JL, Holden JM. Detection of postnatal depression: Development of the 10-item Edinburgh Postnatal Depression Scale (EPDS). *Br J Psychiatry*. 1987; 150:782-86.
- [11] Çoban A, Arslantaş H, Dereboy İF, Kamalak H. Validity and reliability study of the Turkish form of the scale related-pregnancy discomforts. 3rd Annual International Conference on Nursing 1-4 May 2017, Athens, Greece.
- [12] Danacı AE, Dinç G, Deveci A, Şen FS, İcelli İ. Postnatal depression in Turkey: epidemiological and cultural aspects. *Soc Psychiatry Epidemiol*. 2003; 37:125-29.
- [13] Davis DC. The discomforts of pregnancy. *JOGNN*. 1996; 25:73-81.
- [14] Dennis CLE. Preventing postpartum depression part I: A review of biological interventions. *Can J Psychiatry*. 2004; 49:467-475.
- [15] Dubber S, Reck C, Müller M, Gawlik S. Postpartum bonding: The role of perinatal depression, anxiety and maternal-fetal bonding during pregnancy. *Arch Womens Ment Health*. 2015;18:187-95.
- [16] Engindeniz AN, Küey L, Kültür S. Edinburgh doğum sonrası depresyon ölçeği Türkçe formu geçerlilik ve güvenilirlik çalışması. *Bahar Sempozyumları Kitabı, Psikiyatri Derneği Yayınları*, Ankara, 1996.

- [17] Figueiredo B, Costa R, Pacheco A, Pais A. Mother-to-infant emotional involvement at birth. *Matern Child Health J.* 2009; 13:539-49.
- [18] Grigoriadis S, Vonder Porten EH, Mamisashvili L, Tomlinson G, Dennis CL, Koren G, et al. The impact of maternal depression during pregnancy on perinatal outcomes: A systematic review and meta-analysis. *J Clin Psychiatry.* 2013; 74:321-41.
- [19] Harris B, Johns S, Fung H, Thomas R, Walker R, Read G. et al. The hormonal environment of postnatal depression. *Br J Psychiatry.* 1989; 154:660-7.
- [20] Heh S, Fu Y. Effectiveness of informational support in reducing the severity of postnatal depression in Taiwan. *Journal of Advanced Nursing.* 2003; 42:30-6.
- [21] Josefsson A, Angelsioo L, Berg G, Ekstrom CM, Gunnervik C, Nordin C, et al. Obstetric, somatic and demographic risk factors for postpartum depressive symptoms. *Obstet Gynecol.* 2002;99: 223-28.
- [22] Kavlak O, Şirin A. The Turkish version of maternal attachment inventory. *International Journal of Human Sciences.* 2009; 6:188-202.
- [23] Kemp B, Bongartz K, Rath W. Psychic disturbances in the postpartum period: An increasing problem? *Geburtshilfe Neonatol.* 2003; 207:159-65.
- [24] Kingston D, Tough S, Whitfield H. Prenatal and post-partum maternal psychological distress and infant development: A systematic review. *Child Psychiatry Hum Dev.* 2012; 43: 683-714.
- [25] Klainin P, Arthur GD. Postpartum depression in Asian cultures: A literature review. *International Journal of Nursing Studies.* 2009; 46:1355-73.
- [26] McMahon CA, Barnett B, Kowalenko NM, Tennant CC. Maternal attachment state of mind moderates the impact of postnatal depression on infant attachment. *J Child Psychol Psychiatry.* 2006; 47:660-69.
- [27] Moehler E, Brunner R, Wiebel A, Reck C, Resch F. Maternal depressive symptoms in the postnatal period are associated with long-term impairment of mother-child bonding. *Arch Womens Ment Health.* 2006; 9:273-78.
- [28] Muller ME. Prenatal and postnatal attachment: A modest correlation. *J Obstet Gynecol Neonatal Nurs.* 1996; 25:161-66.
- [29] Muller ME. A questionnaire to measure mother-to-infant attachment. *J Nurs Meas.* 1994; 2:129-41.
- [30] Mutlu C, Yorbik Ö, Tanju İA, Çelikel F, Sezer G. The association of prenatal, natal and postnatal factors with maternal attachment in mothers. *Anatolian Journal of Psychiatry.* 2015; 16:442-50.
- [31] Nazik E, Eryilmaz G. Incidence of pregnancy-related discomforts and management approaches to relieve them among pregnant women. *Journal of Clinical Nursing.* 2013; 23: 1736-50.
- [32] Noble RE. Depression in women. *Metabolism Clinical and Experimental.* 2005; 54:49-52.
- [33] O'Higgins M, Roberts IS, Glover V, Taylor A. Mother-child bonding at 1 year; associations with symptoms of postnatal depression and bonding in the first few weeks. *Arch Womens Ment Health.* 2013; 16:381-89.
- [34] Ohoka H, Koide T, Goto S, Murase S, Kanai A, Masuda T, et al. Effects of maternal depressive symptomatology during pregnancy and the post-partum period on infant-mother attachment. *Psychiatry Clin Neurosci.* 2014; 68:631-39.
- [35] Orün E, Yalçın SS, Mutlu B. Relations of maternal psychopathologies, social-obstetrical factors and mother-infant bonding at 2-month postpartum: A sample of Turkish mothers. *World J Pediatr.* 2013; 9:350-55.
- [36] Öztürk R, Saruhan A. The correlation between postpartum depression and maternal attachment of mothers with 1- to 4-month-old premature infants treated at the hospital. *Turkish Journal of Research and Development in Nursing.* 2013; 15:32-47.
- [37] Reck C, Zietlow AL, Müller M, Dubber S. Perceived parenting stress in the course of postpartum depression: The buffering effect of maternal bonding. *Arch Womens Ment Health.* 2016; 19:473-82.
- [38] Republic of Turkey Ministry of Health, Maternal and Child Health and Family Planning General Directorate of Postpartum Care Management Guidelines. Ankara. 2009.

- [39] Righetti-Veltema M, Conne-Perreard E, Bousquet A, Manzano J. Postpartum depression and mother-infant relationship at 3 months old. *J Affect Disord.* 2002; 70:291-306.
- [40] Shinkawa H, Shimada M, Hirokane K, Hayase M, Inui T. Development of a scale for pregnancy-related discomforts. *J Obstet Gynaecol Res.* 2012; 38:316–23.
- [41] Smith SA, Michel Y. A pilot study on the effects of aquatic exercises on discomforts of pregnancy. *J Obstet Gynecol Neonatal Nurs.* 2006; 35:315–23.
- [42] Sunal N, Demiryay A. The physical and emotional complaints of the woman experienced in the period of pregnancy. *Journal of Firat Health Services.* 2009; 4:109-110.
- [43] Tilokskulchai F, Phattanasiriwethin S, Vichitsukon K, Serisathien Y. Attachment behaviors in mother of premature infants: A descriptive study in Thai mothers. *J Perinat Neonatal Nurs.* 2002; 3:69-83.
- [44] Wan MW, Green J. The impact of maternal psychopathology on child-mother attachment. *Arch Womens Ment Health* 2009; 12:123-34.

Reproduced with permission of copyright owner. Further reproduction prohibited without permission.