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Maternal attachment levels of advanced age mothers and relation factors

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ABSTRACT. Being mother at advanced age is associated with physical, emotional and social problems during pregnancy. The purpose of study to finding out the maternal attachment of pregnant women of advanced age and the associated factors. The methodology used was a descriptive and cross-sectional research. The minimum sample size was calculated as 323 in a confidence interval of 95%, with a margin of error of 5%. Total 278 pregnant women were included in this study. Data were collected through Personel Information Form and the Maternal Attachment Inventory. Non-parametric tests (Kruskal-Wallis,Mann-Whitney U), logistic regression analysis was performed for evaluating statistically significant data. The mean of Maternal Attachment Inventory scores is 97.22 ± 17.38 points. The maternal attachment level was higher in cases in which the mother did not work (O.R:0.944), the epidural anesthesia was used (O.R:2.937), the mother had low number of stillbirths (O.R:0.868), the mother gave birth to male infant (O.R:1.022), the newborn had high birth weight (O.R:1.038), the newborn had congenital anomaly (O.R: 0.795) and the mother had no skin-to-skin contact (O.R:0.933). we conclude that though it was discerned that mothers of advanced age had high levels of MA, it was identified that the MA level was affected by certain demographic variables.

Keywords: pregnancy; maternal age; mother-child relations; infant, demography.

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Introduction

Even though pregnancy is a physiological process, it poses serious risks by its nature to the health of mother and baby. During pregnancy, approximately 15% of all women are confronted with a complication which requires professional medical care and need a major obstetric response owing to life-threatening risks (World Health Organization [WHO], 2017). In order to standardize the practices and create treatment protocols, pregnant women who were aged 35-39 years were categorized as being of advanced maternal age whilst those aged 40 years or above were defined as being of highly advanced maternal age by the International Federation of Gynecology and Obstetrics (FIGO) (Gündüz, Cetin, Bahat, Aydın, & Koroglu, 2016). While the age of the first childbirth goes up, the case in which the woman gets pregnant at the age of 35 years or above is still accepted as high-risk pregnancy in the literature. Studies reported that the advanced maternal age had statistically significant associations with adverse pregnancy outcomes such as low birth weight, preterm birth, fetal death and stillbirth, preeclampsia, placental abruption, placenta previa and maternal death (Marozio et al., 2019; Molina-García et al., 2019).

However, it is observed that birth rates of women aged 35 years or above went up in the world especially in western countries. The fertility rate of women aged 35 years or above was identified as 65 births out of 1,000 living births (Turkey Demographic and Health Survey [TDHS], 2018). The aspiration of women to invest in education and professional careers, postponed marriages, remarriages, the hope of raising the children better at advanced age, the failure to use effective contraceptives and the existence of in vitro fertilization among pregnancy options are main reasons for the increase in the fertility rate of the women aged 35 years or above (Kulhan et al., 2017).

Besides being under the category of high-risk pregnancies, being mother at advanced age is associated with physical, emotional and social problems during pregnancy. The follow-up of the woman because of being in the high-risk pregnancy category in conjunction with being at advanced age affects not only the ability to

cope with changes experienced during the pregnancy period but also the delivery and postpartum processes. Problems arising in pregnancies of advanced maternal age and emotional and physical situation associated with maternal age give rise particularly to the emergence of newborn problems in pregnancies of advanced age and the establishment of negative emotional link between mother and the newborn (Kahveci, Melekoglu, Evruke, & Cetin, 2018; Ratnasiri et al., 2018; Hidalgo-Lopezosa et al., 2019).

Maternal attachment is the situation which starts in the prenatal period, continues during childbirth and develops in the postnatal period and in which the emotional link affecting baby's growth, healthy development and future life is established. The earlier and more healthfully mother's communication and interaction with the newborn are established, the more strongly her motherhood emotions will be developed (Alan & Ege, 2013; Akarsu, Tunca, & Alsaç, 2017). Additionally, in a certain study, it was discerned that maternal attachment level fell down along with the increase in mother's age (Ustunoz, Guvenc, Akyuz, & Oflaz, 2010). On the other hand, a study found that maternal age had no impact on maternal attachment (Čėsnaitė, Domža, Ramašauskaitė, Volochovič, & Bužinskienė, 2019). The other study declared that the maternal prenatal attachment is higher for older women rather than the middle women aged 30-35 years (Gioia et al., 2023).

Maternal age is one of the risk factors which create complications for the pregnancy, and it is considered to affect the maternal attachment level. Providing women of advanced maternal age with consultancy and care intended for tackling their concerns and pregnancy risk conditions within the context of prenatal, perinatal and postnatal care is important to the healthcare of mother and her infant. This study aimed to identify the maternal attachment levels of pregnant women of advanced age and the associated factors.

Material and methods

Study design and participants

This is a descriptive and cross-sectional study. The research population was comprised of the pregnant women aged above 35 years in the province of Turkey. According to 2016 data of the Turkish Statistical Institute, the population of females aged 35-49 years was 8,355,459. Given that the ratio of having pregnancy between 35 and 49 years of age was 30% on average as per the relevant literature, the minimum sample size was calculated as 323 by using the method for estimating the sample size of a known population. The research was carried out in the public hospitals located in the province center. All pregnant women who were aged above 35 years, were admitted to Delivery/Obstetric Units in April 2018-April 2019, agreed to participate in the research and gave birth to living infants were included in the research.

Without using any sample selection technique, addressing all pregnant women who were aged above 35 years and met the research criteria was intended, and 278 out of a total of 323 pregnant women were included in the research. The 60 pregnant women who did not satisfy research criteria were excluded from the research. Inclusion ratio of the research is 86%.

Variables

Data were collected through Pregnant Woman Information Form (pregnant women's socio-demographic characteristics, pregnancy, delivery and newborn's obstetric traits) prepared by researchers as per research criteria and Maternal Attachment Inventory.

Maternal Attachment Inventory (MAI): The Inventory was developed in 1994 by Mary E. Muller for the purpose of measuring the attachment to the infant with maternal affection (Muller, 1994; Muller, 1996). Validation and reliability test was performed in 2004 by Kavlak and Şirin for reconfiguring MAI for the Turkish society. As the MAI measuring maternal emotions and behaviors which express affection is supposed to be used by the participant herself, it can be applied to women who are literate and have the reading comprehension ability. It is a 4-point Likert-type scale which is composed of 26 items, each of which is scored from 'always' to 'never'. The MAI items are made up of straight statements and scored as always (a) = 4 points, often (b) = 3 points, sometimes (c) = 2 points and never (d) = 1 point. A general score is obtained from the summation of scores acquired from the entire set of items. High scores indicate that the maternal attachment level is high. The lowest and highest scores to be obtained from the MAI are successively 26 and 104 points (Müller, 1994, 1996; Kavlak & Şirin, 2009). It was asserted that MAI could be applied to mothers who had infants aged 1-4 months and was a valid and reliable scale for use in the Turkish society (Kavlak & Şirin, 2009). In this study, Cronbach's Alpha coefficient was found as 0.98.

Data collection

Research data were collected in two stages. In the first stage, pregnant women were asked to fill in the Pregnant Woman Information Form in their first encounter with the researcher during a face-to-face interview. In the second stage, pregnant women who completed the Pregnant Woman Information Form were contacted once again after the delivery (in 1-4 months after delivery) and were required to fill in the MAI during a face-to-face meeting.

Analysis

Data were presented in the form of means, standard errors and frequencies. Associations between demographic and obstetric variables of pregnant women and means of scores obtained by them from the MAI were examined through non-parametric tests, Kruskal-Wallis Test and Mann-Whitney U Test. Moreover, multinomial logistic regression analysis was performed, and statistical significance was identified if the p-value was lower than 0.05 in 95% confidence interval and with 5% margin of error.

Officially written permissions were received from the Ethics Committee (Date/No: 28.02.2018/04/05) and also from local authority (Date/No:05.04.2018/E.14405) and from the Provincial Directorate of the localization (Date/No:29.03.2018/13511907-000-4671).

Results and discussion

The mean age of the pregnant women who took part in the research is 47.7 ± 2.14 years. The mean first marriage age is 22.1 ± 5.97 years, and the mean marriage duration is 3.39 ± 1.37 years. It was presented sociodemographic variables of all participant pregnant women in Table 1.

Table 1. Socio-demographic characteristics of the pregnant women of advanced age who participated in the research.

Data	n	%	Data	N	%
Age			Family type		
35-49 years	235	84.5	Elementary Family	220	79.1
50 years or above	43	15.5	Extended Family	58	20.9
Age of marriage			Whether the mother has any chronic disease		
< 20 years	149	53.6	Yes	50	18.0
21-30 years	98	35.3	No	228	82.0
30 years or above	31	11.2			
Duration of marriage			Spouse's occupation		
< 9 years	74	26.6	Unemployed	30	10.8
10-14 years	51	18.3	Worker	159	62.2
15-19 years	80	28.8	Civil servant	21	7.6
20 years or above	73	26.3	Others	68	24.5
Education level			Spouse's education level		
Illiterate	72	25.9	Illiterate	41	14.7
Literate	21	7.6	Literate	12	4.3
Primary school graduate	128	46.0	Primary school graduate	173	62.2
High school graduate	44	15.8	High school graduate	36	12.9
Graduate of university or Higher tertiary schools	13	4.7	Graduate of university or higher tertiary schools	16	5.9
Occupation			Socio-economic level		
Housewife	228	82.0	High	44	15.8
Any income-generating job	50	18.0	Medium	147	52.9
			Low	87	31.3
Place of residence			Whether the mother has social security		
Province center	170	61.2			
Province District	40	14.4	Yes	212	76.3
Town-Village	68	24.4	No	66	23.7
Total	278	100.0	Total	278	100.0

Obstetric data of pregnant women were presented in Table 2. The mean of the number of pregnancies (gravida) of women of advanced age is 3.53 ± 0.84. It was ascertained that the mean of the number of living children was 3.98 ± 1.22, the mean of the number of miscarriages was 1.32 ± 1.04 and the mean of the number of stillbirths was 2.80 ± 1.59. It was presented obstetric variables of all participant pregnant women in Table 2.

Table 2. Obstetric data of pregnant women of advanced age who participated in the research.

Obstetric data	n	%	Obstetric data	n	%
Number of pregnancies			Delivery type		
1	14	5.0	General anesthesia-Cesarean section	69	24.9
2	22	7.9			
3 or above	242	87.1	Epidural anesthesia-Cesarean section	85	37.0
			Vaginal delivery	124	44.4
Number of living children			Whether any postnatal problem was experienced		
The first pregnancy	20	7.2	No	250	89.9
In 2 pregnancies	59	21.2	Yes	28	10.1
In 3 or more pregnancies	199	71.5	Birth weight		
Number of stillbirths			⩽ 2,500 g	46	16.6
No stillbirth	248	89.2	2,501-3,500 g	159	57.4
1-2	12	4.3	3,501-4,500 g	51	8.4
3-4	18	6.5	4,500g above	22	7.6
Number of miscarriages			Infant's gender		
No miscarriage	175	62.9	Female	144	51.8
1	63	22.7	Male	134	48.2
2	23	8.3	Whether mother had skin-to-skin contact with infant		
3 or above	17	6.1			
			Yes	235	84.8
Previous delivery type			No	43	15.2
The first pregnancy	22	8.0	Whether mother breastfed the newborn		
Vaginal delivery	113	40.6			
Cesarean delivery	140	50.4	Yes	62	22.3
			No	216	77.7
Whether the current pregnancy is planned			Whether any problem was experienced in the current pregnancy		
Yes	99	35.6	Yes	135	48.4
No	179	64.4	No	143	51.6
			Whether the infant had any congenital anomaly		
			Yes	186	33.1
			No	92	66.9
Total	278	100.0	Total	278	100.0

g: gram.

The maternal attachment of mothers of advanced age toward infants who were born of their current pregnancies was identified through the MAI. The mean of MAI scores is 97.22 ± 17.38 points.

The associations of the means of MAI scores with socio-demographic and obstetric data were examined, and statistically significant differences were displayed in Table 3. In this regard, participants who had low-level socio-economic status, had no job, were members of nuclear families, had cesarean delivery with epidural anesthesia or vaginal delivery, had no stillbirth, gave birth for the first time, had pregnancy for the first time, gave birth to a male infant, who had infants with birth weights of 4,500 g above, whose infants had any congenital anomaly and who had no skin-to-skin contact with their infants had higher means of MAI scores, and these differences were statistically significant (Table 3).

As per the analysis of regression performed for examining the relationship between maternal attachment and independent variables, it was identified that the maternal attachment level was higher in cases in which the mother did not work (O.R: 0.944), epidural anesthesia was used in the delivery (O.R: 2.937), the mother had a low number of stillbirths (O.R: 0.868), the mother gave birth to a male infant (O.R: 1.022), the newborn had high birth weight (O.R: 1.038), the newborn had congenital anomaly (O.R: 0.795) and the mother had no skin-to-skin contact with the newborn (O.R:0.933) (Table 4).

Becoming a mother poses a risk for all age groups, the risk is higher for both mothers and infants in the case of advanced maternal age (Hassan & Hassan, 2017). In the case of pregnancies at advanced maternal age, variables such as being at an advanced phase of chronic diseases and the increase in the risk of fetal genetic disorders along with advanced age and the burnout level and adaptation of the pregnant women affect the pregnancy process and the relationship between mother and fetus (Baghdari, Sahebzad, Kheirkhah, & Azmoude, 2016). The 15.5% of participant pregnant women who were in the group aged 50 years or above.It is known that, along with developments in medicine, the number of pregnancies at advanced age increased

and the pregnancy age went up to 50 years.Half of the pregnant women who were included in the research reported that they got married before they were 20 years-old and the mean of the duration of their marriages was 15 years or above.It is discerned that the majority of pregnant women were primary school graduates or illiterate, were members of nuclear families and had medium income level and social security. The case in which pregnancy at advanced age is more common among women with low education level and with medium and low income levels raises the likelihood of these pregnancies to be unplanned, and in this study, more than half of the pregnant women of advanced age stated that their current pregnancies were unplanned. On the other hand, women get pregnant at advanced maternal age in developed countries primarily for reasons such as the increase in educational opportunities extended to women, career plans, late marriage and enhancements in contraceptive methods (Kulhan et al., 2017; Molina-García et al., 2019).

Table 3. Associations of the means of MAI scores with certain socio-demographic and obstetric data.

Data	X±S.D	Test	p
Income level			
High	79.46 ± 4.52		
Medium	97.64 ± 1.25	46.664*	0.001
Low	103.25 ± 0.28		
Occupation			
Housewife	100.83 ± 0.65	-6.280**	0.000
Any income-generating job	76.88 ± 4.23		
Family type			
Nuclear family	101.74 ± 0.29	-4.931**	0.000
Extended family	76.72 ± 4.14		
Delivery type			
General anesthesia-cesarean section	81.62 ± 3.60		
Epidural anesthesia-cesarean section	101.99 ± 0.64	27.230*	0.000
Vaginal delivery	101.51 ± 0.40		
Number of stillbirths			
No stillbirth	101.82 ± 0.27		
1-2	68.58 ± 8.96	78.263*	0.000
3-4	42.06 ± 3.94		
Number of living children			
The first pregnancy	103.15 ± 0.40		
In 2 pregnancies	86.68 ± 3.42	16.636*	0.000
In 3 or more pregnancies	98.77 ± 1.08		
Infant's gender			
Female	93.59 ± 1.81	-2.394**	0.017
Male	99.65 ± 1.05		
Birth weight			
⩽ 2,500 g	82.28 ± 4.20		
2,501-3,500 g	98.48 ± 1.23	22.838*	0.000
3,501-4,500 g	102.23 ± 0.60		
4,500 g above	100.80 ± 1.16		
Whether the infant had any congenital anomaly			
Yes	102.13 ± 0.29	-5.732**	0.000
No	85.16 ± 2.87		
Whether the mother had skin-to-skin contact with the infant			
Yes	71.50 ± 4.73	-7.014**	0.000
No	101.15 ± 0.57		

*Kruskal-Wallis Test $p < 0.05$, ** Mann-Whitney U Test $p < 0.05$. MAI: Maternal Attachment Inventory g: gram.

Table 4. Logistic regression analysis performed for examining the relationship between maternal attachment and certain variables.

Data	B	S.E.	Wald	df	p	OR Exp (B)
Occupation	-0.058	0.009	37.281	1	0.007	0.944
Delivery type (Epidural)	0.756	0.218	12.04	1	0.001	2.937
Number of stillbirths (No stillbirth)	-0.142	0.029	23.447	1	0.000	0.868
Infant's gender (Male)	0.021	0.008	7.036	1	0.008	1.022
Birth weight (3,500 g or above)	0.037	0.007	25.411	1	0.000	1.038
Whether the infant had any congenital anomaly (Yes)	-0.085	0.021	17.64	1	0.000	0.795
Whether the mother had skin-to-skin contact with the infant (No)	-0.069	1.051	30.503	1	0.000	0.933

g: gram.

Upon the review of obstetric data in this study, it was found that, mostly, the number of pregnancies was 3 or above, the number of living children was 3 or above and most of the participants had no stillbirth and miscarriage. In a study which was conducted in Turkey for comparing characteristics of adolescent pregnant women and pregnant women of advanced age, it was discerned that participant women had obstetric data similar to those of this study (Arslan, Bani, Güneş, & Eryurt, 2020). This situation can be associated with the fact that women of advanced maternal age who have low education level and high number of children have unplanned pregnancies in developing countries. In a study in which data of 32,423 patients gave birth between January 2006 and December 2017,of whom 1,982 were 40 or older on the day of delivery were retrospectively reviewed in the France for the period of 2006-2017. It was indicated that 72.9% of the women aged 25-35 years had primiparity whilst 36.9% of the women aged 40 years and above had primiparity. The other women had 2 or more pregnancies (Bouzaglou et al., 2020).

In this study, it was found that most participant women had cesarean delivery with epidural anesthesia and vaginal delivery in their latest pregnancy, only one tenth of the participant women had postnatal problems relevant to the mother and 51.8% of infants were female. While almost half of the participant women had any problem during pregnancy, one third of the infants had some sort of a problem. In a study performed in Ghana, it was ascertained that the delivery at the age of 40 or above was associated with grand multiparity and unplanned and undesirable pregnancy. As per the study in Ghana, women aged 40 years or above had higher incidences of gestational diabetes and cesarean delivery (Oppong, Torto, & Beyuo, 2020). In a study conducted in Italy with the participation of pregnant women of advanced age, it was asserted that pregnant women of advanced age had more problems during pregnancy and higher incidences of gestational diabetes, preeclampsia and placenta previa than those in the control group.In the relevant literature, there are several studies demonstrating that mothers of advanced age had more problems than relatively young mothers during pregnancy and the postnatal period (Marozio et al., 2019; Molina-García et al., 2019; Rotem et al., 2020).

In this study, the mean of MAI scores is 97.22 ± 17.38 points. In a study carried out in Turkey for comparing the maternal attachment levels of women having vaginal delivery and cesarean delivery, it was reported that the mean of scores obtained from the MAI by young mothers having vaginal delivery and cesarean delivery were consecutively 97.07 ± 7.01 points and 91.86 ± 14.11 points (Cetisli, Arkan, & Oren, 2018). In an experimental study in which prenatal simulation software was utilized, it was noted that the mean of scores obtained by the women in the control group from the MAI was 94.85 ± 11.87 points and the mean age of these women was 27 years (Walt, Lubbe, Coetzee, & Moss, 2016). In various studies in which the MAI was employed, the mean of scores obtained from the MAI by young mothers was close to the one obtained by mothers of advanced age who partook in this study. This situation indicates that mother's age had no association with her maternal attachment level (Chrzan-Dętkoś &Łockiewicz, 2015; Aktas & Alemdar, 2018; Sonobe, Usui, & Hirose, 2018; Sugishita & Kitagawa, 2019).

Examination of the associations between maternal attachment and socio-demographic data of pregnant women of advanced age, it was found that pregnant women of advanced age who had low income level, did not work and were members of nuclear families had higher means of MAI scores than other groups of participant women and these differences were statistically significant. It is thought that, as mother's socio-demographic characteristics are likely to influence her emotional state in this process, they will have effects on maternal attachment (Alhusen, Gross, Hayat, Rose, & Sharps, 2012a).However, in the relevant literature, the number of studies performed on maternal attachment and mothers of advanced age is not at the desired level. In contrast to the findings of this study, a study found that women who had healthful infants and had low-income level had adverse neonatal outcomes (Alhusen et al., 2012a; Alhusen, Gross, Hayat, Woods, & Sharps, 2012b). In this study, high scores obtained from the MAI by the women of advanced maternal age who had low income level, did not work and were members of nuclear families can arise from the fact that these women have experience in establishing maternal relationship with the infant and all their roles and responsibilities are solely oriented to their children and families. Moreover, in certain studies, it was ascertained that maternal attachment had no statistically significant relationship with mother's employment status and socio-demographic characteristics (Hasanpour et al., 2018; Koçak & Özcan, 2018; Pouraboli, Mahdiyeh, & Jahani, 2019).

Additionally, pregnant women of advanced age who had cesarean delivery with epidural anesthesia and vaginal delivery, had no stillbirth and had their first pregnancy had high means of MAI scores. In the relevant literature, there are studies which indicated that there was a statistically significant relationship between maternal attachment and vaginal delivery (Cetisli et al., 2018).

In this study, as per data on the newborn, it was identified that mothers of advanced age who gave birth to male infants, whose infants had birth weights of 3500 g or above, who had no skin-to-skin contact with their infants and had infants with congenital anomalies had higher means of MAI scores.

In the relevant literature, it was found that there was no statistically significant association between maternal attachment scores and the gender of newborns. It was emphasized that infant's gender was of no importance to the maternal attachment (Mutlu, Erkut, Yıldırım, & Gündoğdu, 2018; Özcan et al., 2018). In this study, having higher level maternal attachment toward male infants can arise from the patriarchal nature of the Turkish society and the high value attached to male infants.

It was argued that the perception about the birth weight was important to the production of crucial emotions conducive to positive attachment especially in the first months after the childbirth (Kim et al., 2020). In the guideline titled 'WHO Recommendations: Intrapartum Care for a Positive Childbirth Experience' (World Health Organization [WHO], 2018), it is recommended that all newborns should have skin-to-skin contact with their mothers during the first hour following the childbirth in order to avoid having hypothermia and to support breastfeeding. It is suggested that the maternal attachment will be enhanced along with breastfeeding and skin-to-skin contact in the literature (Aktas & Alemdar, 2018; Pouraboli et al., 2019). In this study, it is thought that MAI scores of pregnant women participating in this study could be affected by virtue of the fact that they shared the same room with their infants, saw and had eye contact with them and heard their voices for 1-4 months after childbirth besides skin-to-skin contact.

It was asserted that unplanned pregnancies made mothers more sensitive to health complications likely to develop and had a statistically significant relationship with the establishment of connection between the mother and infant (Koçak & Özcan, 2018; Mutlu et al., 2018; Özcan et al., 2018; Pakseresht, Rasekh, & Leili, 2018; WHO, 2018; Turan & Erenel, 2019; Kim et al., 2020). The high level of maternal attachment of mothers of advanced age can stem from the feeling of guilt experienced by them because of the growth of risk along with rising age.

The study is limited to the answers given by advanced age mothers who participated in the research.

Conclusion

This study indicates that, even though there was no statistically significant difference in the maternal attachment between mothers of advanced age and relatively young mothers, the maternal attachment level was affected by certain demographic variables by virtue of being a mother of advanced age. More advanced studies should be carried out on this issue, and qualitative studies in relation to mothers of advanced age will be important to the identification of factors which affect the maternal attachment of mothers.

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