

Predictors of maternal attachment among breastfeeding mothers in Jordan

Sawsan Abuhammad 

Faculty of Nursing, Jordan University of Science and Technology, Irbid, Jordan

Correspondence

Sawsan Abuhammad, Jordan University of Science and Technology/Faculty of Nursing, PO Box 3030 Irbid 22110, Jordan.
Email: shabuhammad@just.edu.jo

Funding information

This research received grant from Jordan University of Science and Technology number 20192431.

Abstract

Aim: This study aims to investigate the difference in maternal attachment in different scenarios, that is among mothers who breastfed their infants and mothers who combined breastfeeding with other types of feeding and determine the predictors of maternal attachment in breastfeeding mothers.

Design: A survey was used to collect data from 222 mothers from Jordan University of Science and Technology in Jordan.

Method: Who used breastfeeding or mixed methods and had healthy infants aged from 3 to 12 months and who did not have postpartum complications. The survey was conducted in three healthcare centres in Irbid city, Jordan.

Results: Mothers only breastfeed their infants did not differ in their attachment compared with those who used mixed feeding methods (using breastfeeding with formula feeding). Many factors showed significant impact on maternal attachment, which includes the mother's education, if they have assistance in caring for their infant, marital relationship quality, the infant's gender and the planning for pregnancy.

KEYWORDS

breastfeeding, infant, Jordan, maternal attachment, nurses, nursing

1 | INTRODUCTION

Breastfeeding has positive impacts on the health of mothers and their newborn infants. Specifically, breastfeeding enhances parenting behaviour and strengthens the bond between the mother and the child (Yurtsal & Kocoglu, 2015). At the same time, maternal attachment between a mother and her child builds a harmonious interaction during feeding. The child can receive visual, hepatic and auditory stimulation during feeding while the mother learns the pattern of behaviour of the child through direct sensory feedback (Abuhammad, 2016, Abuhammad and Johnson, 2018).

Various researchers have argued that breastfeeding has a significant effect on maternal attachment. Indeed, it is widely assumed that breastfeeding has a positive relationship with maternal

affection (Gibbs, Forste, & Lybbert, 2018; Scharfe, 2012). Such opinions have played a role in encouraging mothers to prefer breastfeeding over formula, because the former is seen as aiding in the development of maternal affection (Yurtsal and Kocoglu, 2015, Hatamleh et al, 2018a). This predominant viewpoint has caused mothers who do not breastfeed their infants and who prefer bottle-feeding to feel guilty (Bramoh and Davies, 2014). However, there is a lack of substantive scientific and empirical evidence on how breastfeeding enhances maternal attachment. Moreover, some scholars have offered opposing arguments (Jackson, 2016, Schulze and Carlisle, 2010). According to Maonga et al. (2016), there are two types of breastfeeding: exclusive and mixed. Exclusive breastfeeding is further divided into two sub-groups: feeding the infant on breast milk alone and breastfeeding

This is an open access article under the terms of the Creative Commons Attribution-NonCommercial-NoDerivs License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

© 2020 The Authors. *Nursing Open* published by John Wiley & Sons Ltd

supplemented with minerals, vitamins and water. On the other hand, mixed breastfeeding is where the infant receives breast milk along with complementary foods. However, little research has been done to investigate the impact of the types of breastfeeding on maternal attachment (Abuhammad, 2016).

Although maternal attachment develops over time, secure attachment between mother and child is established within the first year of an infant's life (Weaver, Schofield, & Papp, 2018). The attachment process is flexible and changes in accordance with the surrounding environment (Maonga et al., 2016). Moreover, it has been argued that breastfeeding should occur in a stable manner during the first few months of an infant's life (Gibbs et al., 2018; Scharfe, 2012). Therefore, attachment formation can be enhanced, and attachment disorders prevented during the first year postpartum by an early intervention. However, previous studies on the factors affecting maternal attachment have been inconsistent in terms of their results. Hence, it is necessary to undertake robust scientific research on the demographic characteristics of the mothers and other factors that may influence attachment (Abuhammad, 2016, Abuhammad and Johnson, 2018). This study investigated the effect of a range of demographic, perinatal and other variables on maternal attachment. These variables were as follows: family planning and experience during pregnancy and delivery, caring for an infant before being a mother, help during infant care and lessons during antenatal care. Infant age and infant gender were also included demographic variables, as well as the breastfeeding/mixed-method feeding variables because the study involved mothers who had given birth at full-term. The study also investigated some environmental and cultural variables, which included presence of extended family, the perception of the mother on her relationship with the husband and support from the family. The literature has shown that the above-mentioned factors have significant effects on maternal attachment. However, the researchers wanted to investigate the above-listed factors from a cultural perspective and to gain knowledge on the various factors that influence maternal attachment among Jordan mothers specifically. The researchers chose this research direction because no research has been conducted on the issue of maternal attachment in Jordan. The study analysed maternal attachment among Jordanian mothers with infants aged 3 to 12 months postpartum and the demographic characteristics of the environmental factors surrounding the infant and the mother. The factors that the study considered included marital status, income, work and other individuals affected by attachment.

1.1 | Objectives

This study investigated the relationship between the factors related to maternal attachment during breastfeeding. Specifically, this study aimed to:

- (i) Investigate the difference in maternal attachment in different scenarios, that is among mothers who breastfed their infants

and mothers who combined breastfeeding with other types of feeding.

- (ii) Determine the predictors of maternal attachment in breastfeeding mothers.

2 | METHODS

2.1 | Research design

This study used a cross-sectional, correlational design to explore the factors associated with maternal attachment in breastfeeding mothers.

2.2 | Sample

The research participants consisted of mothers who breastfed healthy infants either exclusively or in combination with other types of feeding from birth without maternal complications. The researcher used the G*Power software version 3.1.92 to calculate the sample size. A significance level of 0.05, a power of 0.95 and nine variables were used for multiple regression analysis with a medium effect size of 0.15 and with the minimum number of subjects being 210. Based on an anticipated dropout rate of 15%, the target number of participants was 260. The researcher performed an analysis of the data on 222 breastfeeding mothers. The study was carried in three postpartum care centres in Irbid city, Jordan. The study included Jordanian mothers who were able to read and write in Arabic and who had visited health centres for immunization or any other type of health care.

2.3 | Instrument

2.3.1 | Maternal attachment inventory

This study used self-reported data derived from the completion of the Maternal Attachment Inventory (MAI; Müller, 1994) to measure the level of maternal attachment among the participants. Specifically, the MAI measured the extent of a woman's attachment to her infant and any perceived obstacles to expressing her attachment or responding effectively to her infant. Three dimensions were covered by the MAI form: tolerance, pleasure of proximity and acceptance/competence. Six categories of maternal response to infants were considered in this study: smiling, eye contact, auditory signals, eye direction, touch and offering food. The infants' behaviour that was investigated included as follows: gazing towards or away from the mother and facial expression in response to the gaze given by the mother (Gharaibeh & Hamlan, 2012, Müller, 1994). A four-point Likert-type scale was used to score the responses of the participants to the 26 items in the MAI form. Each item was in the

form of a direct statement. The answers were scored as follows: 1: never, 2: sometimes, 3: frequently and 4: always. The total score was calculated by adding up the scores awarded to all 26 items. Hence, the minimum score was 26 and the highest score was 104. A greater score indicated greater maternal attachment. A score above 75 denoted a high level of maternal attachment. The advantage of using the MAI is its ability to provide valid and reliable results (Gharaibeh & Hamlan, 2012). The MAI was translated into Arabic and administered to a sample of 200 participants in a previous study. As Jordan is a conservative country, it was decided that the MAI was more appropriate for measuring maternal attachment as compared to using observational measures. A Cronbach's alpha coefficient of 0.91 for the MAI among Jordanian mothers has previously been reported (Gharaibeh & Hamlan, 2012).

2.3.2 | Demographic and breastfeeding characteristics survey

Information on the mother's age, number of children, annual family income, educational status, marital status, employment status and the size of the family constituted the demographic data, perinatal information, which included data such as the total number of pregnancies and type of delivery and information on the methods of feeding.

2.4 | Data collection

The study participants were from three postpartum care centres in Irbid city. Irbid city has a population of approximately 1.5 million residents. Each postpartum care centre serves about 30,000 Jordanian mothers and their infants. The services offered in these centres include prenatal care, postpartum care, family planning and immunization (Ministry of Health, 2010). The researchers used the help of a trained research assistant at the postpartum care centre to identify women who were eligible for the study. The research assistant provided them with the study information. The researcher then visited the directors of the postpartum centres and explained the purpose of the study, data collection methods and, following their agreement, issued publicity posters to facilitate recruitment of the participants. Data were collected from January to April 2018. Brochures were issued to breastfeeding mothers (exclusively or mixed method). Postpartum care nurses were the research assistants who helped in explaining the study to the mothers and collected their contact information. The survey instrument was given to the participants by hand.

The survey was given together with an explanatory letter to 240 mothers who were in their first-year postdelivery. The study only included participants who were breastfeeding at the time of the survey. Those who were eligible to participate in the survey were Jordanian breastfeeding women who were 18 years old and above, had an infant aged between 3–12 months and spoke fluent Arabic. Participation was voluntary and the women who agreed

to participate in the study signed a consent form. The researcher assured the participants of the confidentiality of their responses in the covering letter. The researcher also explained to the participants that they had the right to withdraw from the study at any time. Following the receipt of their consent, a one-time survey containing the data collection tool was given to the participants. The survey was designed to take approximately 30 min to complete. After the survey forms were completed, the data were de-identified and entered into the Statistical Package for the Social Sciences (SPSS) version 25 (IBM). The hard copies of the completed surveys were kept under lock and key in the office of the principal investigator. A total of 222 out of 240 participants responded to the survey.

2.5 | Ethical considerations

The researchers sought the approval of the Institutional Review Board of Jordan University of Science and Technology prior to the conduct of the study. The women who voluntarily agreed to participate in the study clicked the survey link in the e-mail, from which they were able to access the description of the study and an explanation regarding the issues of confidentiality, anonymity, revocability and the pros and cons of participating in the study. The data from the completed surveys were kept in a secure place that was only accessible to the researcher. The files containing the data will be destroyed within 3 years after completing the analysis.

2.6 | Data analysis

The researcher used SPSS 25 to analyse the collected data in terms of frequency, percentage and standard deviation of the research variables. The mean and the standard deviation were used for maternal attachment. *t* test was used to meet the first objective of determining the difference in maternal attachment between breastfeeding and mixed feeding mothers. Multiple regression analysis was used to determine the predictors of maternal attachment. A multiple regressions test was the most appropriate test to conduct for the objective of this study since the sample met all the criteria of multiple regression such as normality and the sample size that required to conduct this type of analysis.

3 | RESULTS

3.1 | Demographic and breastfeeding characteristics

The age of the mothers ranged from 18 to 40 years and the mean age was 27.3 years. Approximately 61% ($N = 150$) of the mothers had not been educated beyond secondary level. Most of the mothers stated in the survey that they were unemployed (86.6%, $N = 240$). The mean family monthly income was 339.5 Jordanian dinars. Further,

many of the women lived with extended family (20.9%, $n = 58$). As regards the demographic characteristics of the infants, the ages of the infants ranged from 3 to 12 months and the mean age was 8 months. 46.3% ($N = 129$) of the infants were female and 53.7% ($N = 148$) were male. Approximately 36% ($N = 94.4$) of the infants were in families who received assistance with caring for their infants. Of the mothers who received support, 65% ($N = 70$) received that assistance from the grandparents of their child. Most of the mothers reported having previous experience of caring for an infant (74.4%, $n = 206$). Most mothers said that the relationship with their husband was very good (80.5%, $N = 223$), whereas 2.2% ($N = 6$) reported a poor relationship with their husband.

Approximately 66.4% ($N = 193$) of the mothers had planned their pregnancy, 66.4% ($N = 193$) had had a vaginal delivery and 51.6% ($N = 143$) were breastfeeding at the time of the study. A high proportion of mothers had received antenatal education and care in the pregnancy period (83.8%, $N = 232$). Around half of the participants described their pregnancy as very good. Table 1 presents the findings from the descriptive analysis of the demographic and perinatal characteristics.

3.2 | Differences in maternal attachment between exclusive breastfeeding and mixed-method mothers

The t test results showed insignificant differences in maternal attachment between mixed and exclusive breastfeeding at three months ($t = 0.67$, $p = .45$). This means that exclusive breastfeeding mothers did not differ in their attachment when compared with mixed feeding mothers who used formula feeding and depended on other ways of feeding.

3.3 | Factors associated with maternal attachment

The researcher carried out multiple regression analysis to investigate the comparative effects of a variety of factors on maternal attachment. After assessing the Durbin-Watson statistics, the researcher entered the tolerance, variation inflation factor (VIF) and unemployed status variables into the one regression analysis. It should be noted that the researcher excluded the maternity leave status because it was assumed that there would be multicollinearity between maternity leave status and unemployed status. Excluding maternity leave status resulted in a Durbin-Watson statistic of 1.99.

As this value was very close to the reference value of 2, this showed that there was no autocorrelation. The tolerance values ranged from 0.41–0.94 and the VIF varied from 1.06 to 2.42. These results showed that there were no multicollinearity issues in respect of the independent variable. Hence, the researcher was able to confirm that the regression model was appropriate.

Multiple regression analysis was used in the development of a model to predict the factors affecting maternal attachment. Each of the predictor variables showed a significant ($p < .01$) zero-order relationship with maternal attachment, but many factors apart from infant temperament had a significant partial impact in the full model ($p < .05$). The predictor model was able to account for 45% of the variance in maternal attachment: $F(4, 25) = 4.78$, $p < .01$, $R^2 = 0.44$, 95% CI 0.35, 0.72. Based on this analysis, the explanatory factors for maternal attachment in breastfeeding mothers were mother's level of education ($B = 1.02$, $p < .05$), assistance in caring with child ($B = 3.59$, $p < .05$), marital status ($B = -1.66$, $p < .05$), the gender of the infant ($B = 2.25$, $p < .05$) and the planning of the pregnancy ($B = 2.78$, $p < .05$) (Table 2).

4 | DISCUSSION

The research findings discussed here were deduced in the context of the culture of Jordanian Arab Muslims and are of significance to healthcare providers dealing with maternal attachment, which is seen as one of the key maternal issues globally. This study aims to investigate the difference in maternal attachment in different scenarios, that is among mothers who breastfed their infants and mothers who combined breastfeeding with other types of feeding and determine the predictors of maternal attachment in breastfeeding mothers.

The findings from this study suggest that no difference in maternal attachment between exclusive and mixed breastfeeding mothers. This implies that encouraging breastfeeding will enhance the building of maternal attachment regardless of whether the mother used an exclusive or mixed breastfeeding method. These findings conform to those of previous studies by Gibbs et al. (2018) and Scharfe (2012) who found that breastfeeding is associated with maternal attachment. According to Gibbs et al. (2018), breastfeeding enhances attachment because infants who breastfeed are warmer, cuddlier, more cooperative and less demanding compared with those who are not breastfed. The researchers also examined the link between breastfeeding and maternal attachment and

TABLE 1 Differences in maternal attachment between exclusive and mixed-method breastfeeding

		t	Sig. (2-tailed)	Mean difference	Std. error difference	95% Confidence interval of the difference	
						Lower	Upper
Attachment	Equal variance assumed	-0.687	0.493	-0.531	0.773	-2.055	0.992
	Equal variances not assumed	-0.685	0.494	-0.531	0.775	-2.064	1.001

TABLE 2 Multiple regression for factors predict maternal attachment in breastfeeding mothers

Variable	B	T-test	p value
(Constant)	26.473	6.815	.000
Education	-1.020	-2.110	.039
Employment	-0.964	-0.820	.415
Assistance	-3.591	-3.258	.002
Who assist	1.258	2.265	.027
Experience	-1.077	-1.106	.273
Housing	0.555	0.556	.580
Marital status	-1.665	-2.594	.012
Income	0.004	1.433	.156
Infant age	-0.031	-0.202	.840
Infant gender	2.205	2.485	.015
Pregnancy planned or not	2.786	2.762	.007
Delivery method	-1.474	-1.644	.105
Receive prenatal data	-0.447	-0.287	.775

Note: p value < .05.

found no association between these factors and maternal attachment. However, their study does not provide details of the demographic characteristics of the mothers and other factors that may affect attachment. Therefore, the current study has filled a research gap by investigating the demographic and other factors that could have an impact on maternal attachment in mothers who are breastfeeding.

According to Cerezo, Pons-Salvador, Trenado, and Sierra-García (2016) and Cho et al. (2016), the level of attachment in an infant is influenced by interactions and experiences with the caregiver. Breastfeeding initiates an opportunity for the mother to understand and study her baby's pattern of behaviour in response to affection and eye contact. Communication includes an emotional exchange with the infant because of careful observation of the mother on the feelings and reactions of the infant results in maternal attachment. This finding corresponds with a report that indicated that "kangaroo care" affects the attachment of premature infants.

To meet the second objectives of this study, multiple regression analysis found that many factors play a role in determining maternal attachment of breastfeeding mothers. These factors could explain 45% of the variance in maternal attachment. Based on this analysis, the explanatory factors for maternal attachment in breastfeeding mothers were mother's level of education ($B = 1.02, p < .05$), assistance in caring with child ($B = 3.59, p < .05$), marital status ($B = -1.66, p < .05$), the gender of the infant ($B = 2.25, p < .05$) and the planning of the pregnancy ($B = 2.78, p < .05$).

The current study found statistically significant differences in the level of maternal attachment regarding infant characteristics such as gender and age. This was consistent with Dr Al-Akour (2008), who mentioned that Jordanian culture appreciates male children more

than it does female children. Al-Akour (2008) found that breastfeeding mothers see the gender of their baby as a major concern. The significant difference in maternal attachment in relation to pregnancy planning found in this study is attributed to the belief that couples in the Jordanian community should take on the parenting role instantly after marriage due to a variety of reasons (Gharaibeh and Hamlan, 2012).

Our study found a significant difference in maternal attachment with regard to state of their marital relation in breastfeeding mothers. Mothers who felt that they had a robust marital relation had a stronger attachment to their children. This finding is consistent with the conclusions made by Abuhammad (2016). The authors deduced that a solid marital relation enhanced the ability of the mother to correctly interpret their baby's signals. Most mothers perceive that experiencing support from partners is critical during breastfeeding. Moreover, the duration of breastfeeding had a positive correlation with the time spent with the partner after delivery. The presence of the partner reflected on the closeness of the couple and the nature of their relationship.

Our study found no significant difference in attachment among mothers who experienced difficulty during pregnancy and childbirth compared with those who did not. This finding is in line with Abuhammad (2016), who stated that mothers at high risk have no difference in attachment to their infants compared with women who are considered to have had a low-risk pregnancy and labour. On the other hand, the low scores among most of the participants for the evoking behaviour subscale reflected the mothers' perceptions of their ability to identify a change in behaviour shown by their infant to respond to their needs. This finding can be accredited to the fact that the participants did not receive parental training during the prenatal period. According to yang & seo (2013) and Abu Aishee (2008), there is an assumption that parenting involves multifaceted tasks and capabilities that go beyond cleaning, feeding and providing comfort, especially among breastfeeding mothers. Moreover, prior research among Jordanian mothers has shown that parenting is not one of the priorities during the postpartum period (Abu Aishee, 2008). Breastfeeding mothers who had experience in infant care before having children and who lived with extended family showed high maternal self-efficiencies (Abuhammad, 2016; Hatamleh, Maghydah, Abuhammad, & Rababah, 2018). Similarly, researchers have found that level of education and experience are significant determinants of ability to care for an infant (Abuhammad, 2016). The interpretation of the findings reveals the significance of engaging young Arab girls in childcare before marriage. It is acceptable for young girls to take care of infants as it prepares them for future mothering roles (Al-Akour, 2008, Maonga, Mahande, Damian, & Msuya, 2016). Our findings were consistent with previous studies by Parkinson et al. (2010) and by Cinar et al. (2015), who found that personal social support is essential for both breastfeeding and maternal attachment. According to Handayani et al. (2012), social support, attitude, self-efficacy and knowledge are critical during breastfeeding. Handayani et al. also found that there is a strong correlation between social help and parental support.

Various studies point out that mothers who receive emotional and physical support have a higher maternal attachment (Abuhammad et al, 2019; Lamb, 2012). The culture and practices of Jordanian people contribute to the assumed maternal capabilities and the ability to care for an infant. In Jordanian culture, the mother and mother-in-law provide guidance to the new, first-time mother on breastfeeding, prenatal care and abdominal massage, as well as how to prepare meals to ensure adequate breast milk production (Gharaibeh & Hamlan, 2012). Traditionally, this support lasts for forty days (Hatamleh, Maghydah, et al., 2018; Jakalat, 2007). From the results of the current study, mothers who had cared for infants before have more confidence performing nurturing routines. On top of that, mothers who had received support through coaching and verbal motivation also had a higher level of skills in nurturing an infant. These findings are like the conclusions in prior research by Weaver et al. (2018), who found that support is essential in enhancing the ability of the mother to deal with the infant.

4.1 | Implications for nurses and health practitioners

Nurses, obstetricians, healthcare providers and many other people who have direct and indirect contact with mothers have a responsibility to assess, intervene, educate and make a referral to specialized healthcare providers if a mother is exhibiting signs of needing help. Nurses in particular play an important part in educating mothers about the importance of their role in their child's development. Nurses dedicate their time to teaching mothers about numerous aspects related to the mothering role, from skin-to-skin contact to breastfeeding. Nurses could or can also provide education on healthy mother-infant interaction and help with achieving that.

The United States federal government and the Jordanian government have both published recommendations for improving breastfeeding and friendliness at paediatric hospitals (Kasem, Abuhammad, Kassab, & Al Ali, 2020). These recommendations provide structured guidelines for nurses, healthcare providers and employers to increase the rate of breastfeeding. The results of the current study together with these guidelines may assist nurses and healthcare providers in helping families affected by low maternal attachment and in giving extra preventative support to those families at risk.

5 | LIMITATIONS

This study had various limitations. First, the generalizability of the research findings and interpretation may be difficult or impossible because the participants were breastfeeding mothers from a small area in Jordan. The study excluded mothers who did not visit postpartum care centres. Moreover, it did not include non-breastfeeding mothers. Rather, the study aimed at finding out whether there was a relationship between breastfeeding and maternal attachment among women who were breastfeeding, not at comparing the level

of maternal attachment between breastfeeding and non-breastfeeding mothers.

6 | CONCLUSION

The quality of the marital relation, knowledge of pregnancy and experience of pregnancy and delivery were the three culturally significant variables that were found to affect maternal attachment of breastfeeding mothers in this study. The ability of the mother to care for the infant was found to explain the variance in maternal affection. Mothers with a robust belief in their skills to provide care for their infants were professionally dealing with their infant. The researcher witnessed observation rather than data analysis differences among mothers who had prior experience of caring for a child and those who had support from the extended family. The findings illustrate the significance of guiding young girls to help them in fulfilling their future nurturing roles and understanding the value of the family support given to mothers. The difference in maternal attachment reflected the influence of Arabic Muslim culture. Besides this, having a good marital relation during pregnancy and delivery enhanced the attachment between the mother and the baby.

CONFLICT OF INTEREST

The authors have no funding or conflict of interest to disclose.

ORCID

Sawsan Abuhammad  <https://orcid.org/0000-0001-5817-8950>

REFERENCES

- Abu Aishee, S. (2008). Postpartum learning needs: Jordanian mothers and nurses perceptions Unpublished Master Thesis. Irbid-Jordan: Jordan University of Science and Technology.
- Abuhammad, S. H. (2016). The possible effect of breastfeeding on maternal attachment during the first year of life. (Doctoral dissertation, The University of Wisconsin-Milwaukee).
- Abuhammad, S., & Johnson, T. (2018). Potential impact of breastfeeding and maternal attachment during the first year of life: An integrative review of the literature. *International Journal of Pediatrics*, 6(12), 8655–8667.
- Abuhammad, S., Khraisat, O., Joseph, R., & Al Khawaldeh, A. (2019). Factors that predict infant temperament: A Jordanian study. *Journal of Pediatric Nursing*, 51, e45–e49. <https://doi.org/10.1016/j.pedn.2019.08.002>
- Al-Akour, N. (2008). Knowing the fetal gender and its relationship to seeking prenatal care: Results from Jordan. *Maternal Child Health Journal*, 12, 787–792. <https://doi.org/10.1007/s10995-007-0298-9>
- Braimoh, J., & Davies, L. (2014). When 'breast' is no longer 'best': Postpartum constructions of infant-feeding in the hospital. *Social Science & Medicine*, 123, 82–89. <https://doi.org/10.1016/j.socscimed.2014.10.052>
- Cerezo, M. Á., Pons-Salvador, G., Trenado, R. M., & Sierra-García, P. (2016). Mother-infant verbal/nonverbal interaction as predictor of attachment: Non-linear dynamic analyses. *Sciences*, 20(4), 458–508.
- Cho, E. S., Kim, S. J., Kwon, M. S., Cho, H., Kim, E. H., Jun, E. M., & Lee, S. (2016). The effects of kangaroo care in the neonatal intensive care unit on the physiological functions of preterm infants, maternal-infant

- attachment and maternal stress. *Journal of Pediatric Nursing*, 31(4), 430–438. <https://doi.org/10.1016/j.pedn.2016.02.007>
- Cinar, N., Köse, D., & Altinkaynak, S. (2015). The relationship between maternal attachment, perceived social support and breast-feeding sufficiency. *Journal of the College of Physicians and Surgeons Pakistan*, 25(4), 271–275.
- Gharaibeh, M. K., & Hamlan, A. M. (2012). Factors influencing maternal attachment of first-time Jordanian mothers. *Journal of Research in Nursing*, 17(3), 289–303.
- Gibbs, B. G., Forste, R., & Lybbert, E. (2018). Breastfeeding, parenting and infant attachment behaviors. *Maternal and Child Health Journal*, 22(4), 579–588. <https://doi.org/10.1007/s10995-018-2427-z>
- Handayani, L., Kosnin, A. M., & Jiar, Y. K. (2012). Breastfeeding education in term of knowledge and attitude through mother support group. *Journal of Education and Learning*, 6(2), 65–72. <https://doi.org/10.11591/edulearn.v6i2.148>
- Hatamleh, R., Abuhammad, S., & Rababah, H. (2018a). Breastfeeding knowledge and attitude scale: Arabic version Evidence Based. *Midwifery*, 16(2), 40–43.
- Hatamleh, R., Maghydah, S., Abuhammad, S., & Rababah, H. (2018). Knowledge, attitudes and future intentions towards breastfeeding among undergraduate students at a Jordanian public university Evidence based. *Midwifery*, 16(4), 136–142.
- Jackson, D. B. (2016). The association between breastfeeding duration and attachment: A genetically informed analysis. *Breastfeeding Medicine*, 11(6), 297–304. <https://doi.org/10.1089/bfm.2016.0036>
- Jakalat, S. (2007). Postpartum practices of Jordanian women. Unpublished Master Thesis. Irbid Jordan: Jordan University of Science and Technology.
- Kasem, A., Abuhammad, S., Kassab, M., & Al Ali, M. (2020). Caregivers help-seeking behaviors for post discharged neonates from neonatal intensive care units: A Jordanian study. *Journal of Pediatric Nursing*, 23(13), <https://doi.org/10.1016/j.pedn.2020.06.003>
- Lamb, M. E. (2012). Infant–father attachments and their impact on child development. In *Handbook of father involvement* (pp. 109–133). Routledge.
- Maonga, A. R., Mahande, M. J., Damian, D. J., & Msuya, S. E. (2016). Factors affecting exclusive breastfeeding among women in Muheza District Tanga northeastern Tanzania: A mixed method community based study. *Maternal and Child Health Journal*, 20(1), 77–87. <https://doi.org/10.1007/s10995-015-1805-z>
- Ministry of Health (2010) : Report of health centers in Irbid city.
- Müller, M. E. (1994). A questionnaire to measure mother-to-infant attachment. *Journal of Nursing Measurement*, 2(2), 129–141. <https://doi.org/10.1891/1061-3749.2.2.129>
- Parkinson, J., Russell-Bennett, R., & Previte, J.(2010). The role of mother-centered factors influencing the complex social behaviour of breastfeeding: Social support and self-efficacy.
- Scharfe, E. (2012). Maternal attachment representations and initiation and duration of breastfeeding. *Journal of Human Lactation*, 28(2), 218–225. <https://doi.org/10.1177/0890334411429111>
- Schulze, P. A., & Carlisle, S. A. (2010). What research does and doesn't say about breastfeeding: A critical review. *Early Child Development and Care*, 180(6), 703–718. <https://doi.org/10.1080/03004430802263870>
- Weaver, J. M., Schofield, T. J., & Papp, L. M. (2018). Breastfeeding duration predicts greater maternal attachment over the next decade. *Developmental Psychology*, 54(2), 220.
- Yang, H. J., & Seo, J. M. (2013). A Structural Model for Primiparas' Breastfeeding Behavior. *Journal of Korean Academy of Nursing*, 43(3), 399. <https://doi.org/10.4040/jkan.2013.43.3.399>
- Yurtsal, Z. B., & Kocoglu, G. (2015). The effects of antenatal parental breastfeeding education and counseling on the duration of breastfeeding and maternal and paternal attachment. *Nutrition and Metabolism*, 2, 222–230.

How to cite this article: Abuhammad S. Predictors of maternal attachment among breastfeeding mothers in Jordan. *Nursing Open*. 2021;8:123–129. <https://doi.org/10.1002/nop2.610>