

# The Impact of Early Maternal Separation on Depression, Anxiety and Attachment Styles in Adulthood

Gamze Gürcan<sup>1</sup>

<sup>1</sup>TOBB University of Economics and Technology, Department of Psychiatry, , Faculty of Medicine, Ankara, Türkiye

## Abstract

**Introduction:** Early maternal separation is a significant stressor with potential long-term consequences for mental health. It is known that early maternal separation affects adult attachment styles as well as psychopathologies such as depression and anxiety.

**Methods:** This study investigated the relationship between early maternal separation experiences and adult psychopathology, focusing on attachment styles, depression, and anxiety symptoms. Sixty-one patients presenting with depression and anxiety symptoms, and who had experienced maternal separation within the first three years of life, were included and the data was collected retrospectively. Two distinct patterns of early maternal separation were identified: long-term continuous separation and repeated short-term separations. Clinical assessment included the Beck Depression Inventory, Beck Anxiety Inventory and Adult Attachment Scale (secure, avoidant, anxious-ambivalent).

**Results:** Maternal separation during the first year of life was associated with significantly higher depression scores. Patients with avoidant attachment showed the highest depression scores, while those with secure attachment demonstrated the lowest. Long-term separation was predominantly associated with avoidant attachment and higher depression scores, while repeated short-term separations correlated with anxious-ambivalent attachment and higher anxiety scores.

**Conclusion:** These findings suggest that the timing, duration, and pattern of early maternal separation significantly influence adult psychopathology and attachment styles, highlighting the importance of early mother-child bonding for mental health outcomes. Further longitudinal research with larger samples is needed to confirm these findings and elucidate the underlying mechanisms.

**Key words;** Maternal separation; depression; anxiety; attachment.

## Introduction

Attachment is a foundational element of early human development, characterized by a child's tendency to seek proximity and comfort from a primary caregiver, especially under stress (1). According to attachment theory, originally developed by Bowlby and later elaborated by Ainsworth, the formation of a secure, continuous emotional bond with a consistent caregiver is critical for healthy psychological development. Bowlby emphasized that disruptions in this bond—through separation, deprivation, or loss—can lead to maladaptive emotional and cognitive outcomes (2, 3). From an evolutionary perspective, attachment functions as a protective mechanism, providing a “secure base” that supports emotion regulation and reduces separation anxiety (4, 5). Subsequent research has expanded attachment theory to include lifespan and adult relational patterns. Ainsworth's early empirical work classified infant attachment into secure, anxious-ambivalent, and avoidant

categories (6). Hazan and Shaver (1987) extended these patterns into adulthood, and Bartholomew and Horowitz (1991) further refined adult attachment classifications into four types—secure, dismissive-avoidant, preoccupied, and fearful—based on internal working models of the self and others (7, 8). These models emphasize the lasting influence of early caregiving experiences on adult emotion regulation, interpersonal functioning, and vulnerability to psychopathology. A growing body of research has demonstrated that early relational adversity, particularly maternal separation, has far-reaching implications for mental health. Zhao et al. (2022) found that early separation from caregivers is significantly associated with cognitive impairments and internalizing symptoms in adolescence (9). Similarly, LeMoult et al. (2020) reported that early life stress substantially increases the risk of depressive disorders (10). At the population level, Bellis et al. (2019) documented the economic and health-related

\*Corresponding Author: Gamze Gürcan Department of Psychiatry TOBB University of Economics and Technology, Faculty of Medicine Söğütözü, Ankara, Turkey Email: [gamzebostankolu@hotmail.com.tr](mailto:gamzebostankolu@hotmail.com.tr) Orcid: Gamze Gürcan [0000-0001-9896-8869](https://orcid.org/0000-0001-9896-8869)



burden of adverse childhood experiences, while Narayan et al. (2021) highlighted the intergenerational transmission of these risks (11, 12). More recently, Zhang and Bayly (2025) showed that the interplay between early adversity and environmental deprivation contributes uniquely to developmental psychopathology (13). Biological mechanisms have also been implicated in the effects of early maternal separation. The postnatal brain undergoes rapid synaptic development and hormonal regulation, both of which are highly sensitive to environmental stressors. Research indicates that such early adverse experiences increase vulnerability to emotional, cognitive, and psychiatric disorders in adulthood (10–12, 14–17). Disruption of the mother-infant bond during this critical period has been shown to alter the functioning of the hypothalamic-pituitary-adrenal (HPA) axis, leading to long-term dysregulation in stress response systems (18–23). According to the match/mismatch theory, if early stress exposure is incongruent with later life conditions, it may increase susceptibility to emotional disorders, including anxiety and depression (8, 24–26). This study investigates the long-term psychological effects of early maternal separation in individuals presenting with depression and/or anxiety symptoms in adulthood. This study focuses on a population where early maternal separation was common, particularly in families where mothers worked and alternative caregivers were employed. The aim of the study is to determine the sociodemographic and clinical characteristics of individuals who present with symptoms of depression and/or anxiety and whose developmental history reveals that they experienced maternal separation in the early years of life. The study hypothesizes that variations in early maternal separation (specifically in terms of duration and type) have distinct impacts on adult psychopathological outcomes.

## Material and Methods

**Participant:** This study was conducted at the Department of Psychiatry, TOBB University of Economics and Technology, and among all patients who applied to the clinic in the last three years, 61 patients who met the inclusion criteria and were followed up in our clinic were included in the study. This study utilized a retrospective observational design based on chart review. Patients were included if they had experienced maternal separation during the first three years of life, were between 18–65 years old, presented to the psychiatry outpatient clinic with symptoms of

depression and/or anxiety as confirmed by clinical psychiatric evaluation.

**Inclusion criteria:** Age between 18–65 years, Documented maternal separation within the first three years of life, Clinical presentation with symptoms of depression and/or anxiety.

**Exclusion criteria:** Diagnosed psychotic disorders or major neurological conditions, Impaired cognitive functioning or communication ability, Missing/incomplete clinical records.

**Procedure:** The study received ethical approval from the local ethics committee (TOBB University of Economics and Technology Scientific Research Ethics Committee, No:BAEK-21). Extracted data included sociodemographic characteristics, details of early maternal separation (e.g., age of separation, duration, frequency), clinical assessment scores at intake, and predominant attachment styles in close interpersonal relationships, as recorded in psychiatric evaluations.

**Two distinct patterns of maternal separation were identified:**

- **Prolonged Separation:** The child resided for an extended period with an alternative caregiver (e.g., grandparent) in a separate household.
- **Repeated Short-Term Separation:** The child spent weekdays in the care of an alternative caregiver in another home and weekends with the biological parents.

These separation types were coded and used for subgroup analyses.

**Instruments:** The clinical scale scores at the time of application were recorded.

**The Sociodemographic and Clinical Information Form:** The data of sociodemographic properties, the characteristics of maternal separation from the mother in the first three years of life (the duration of separation, whether there were repeated separations, in which month of life the separation occurred) were collected.

**Beck Depression Inventory (BDI):** The scale was developed by Beck et al. (1961) and it is a widely used 21-item self-report scale designed to measure the severity of depressive symptoms (27). Each item is scored on a scale from 0 to 3, with higher total scores indicating more severe depression. The Turkish adaptation by Hisli (1989) demonstrated good internal consistency with a Cronbach's alpha of 0.80 (28). The scale has been validated in both clinical and non-clinical populations, supporting its reliability and construct validity in assessing depression severity.

**Beck Anxiety Inventory (BAI):** The scale was developed by Beck et al. (1988) (29). BAI evaluates the frequency of anxiety symptoms experienced by the individual. It is a self-

assessment scale consisting of twenty-one items and scored between 0-3. The patient is asked questions about how much the feeling of distress has bothered him/her in the last week.

**Table 1:** Sociodemographic and Clinical Characteristics of Patients

|                                                                        | n (%)                                        |        |
|------------------------------------------------------------------------|----------------------------------------------|--------|
| Gender                                                                 |                                              |        |
| Female/Male                                                            | 42(68.9) / 19(31.1)                          |        |
| Social environment (childhood)                                         |                                              |        |
| Urban/Rural                                                            | 41(67.2) / 20(32.8)                          |        |
| Social environment (current)                                           |                                              |        |
| Urban/Rural                                                            | 58(95.1) / 3(4.9)                            |        |
| Graduation                                                             |                                              |        |
| Primary school/secondary school/high school/university/master's degree | 0(0) / 3(4.9) / 12(19.7) / 43(70.5) / 3(4.9) |        |
| Income status                                                          |                                              |        |
| Low/Middle/Upper middle/High                                           | 3 (4.9) / 37 (60.7) / 20 (32.8) / 1 (1.6)    |        |
| Marital status                                                         |                                              |        |
| Single/Married                                                         | 21 (34.4) / 40 (65.6)                        |        |
| Repeated separations                                                   |                                              |        |
| Yes / No                                                               | 27 (44.3) / 34 (55.7)                        |        |
| AAS Group                                                              |                                              |        |
| Secure/Avoidant/Anxious-ambivalent                                     | 21 (34.4) / 15 (24.6) / 25 (41)              |        |
|                                                                        | Mean±SD                                      | Median |
| Age                                                                    | 39.21 ± 9.38                                 | 38.5   |
| Duration of seperation (month)*                                        | 18.32 ± 9.79                                 | 20     |
| Clinical Scales                                                        |                                              |        |
| BDI                                                                    | 33.82 ± 9.61                                 | 34     |
| BAI                                                                    | 25.71 ± 10.22                                | 25     |

**BDI:** Beck Depression Inventory, **BAI:** Beck Anxiety Inventory, **AAS:** Adult Attachment Scale, \*Only the data of the group experiencing long-term separation was calculated (n=34)

The Turkish version, adapted by Ulusoy et al. (1995), showed excellent internal consistency (Cronbach's alpha = 0.93) and good test-retest reliability (30).

**Adult Attachment Scale (AAS):** The AAS consists of two sections. The first section, developed by Hazan and Shaver (1987), consists of three different statements, each of which is used to classify adults as secure, anxious-ambivalent, and avoidant; includes definitions about the characteristics of the relationship with the parent in childhood and general behavioral characteristics (7). The Turkish adaptation by Erol and Savaşır (2001) demonstrated satisfactory reliability with Cronbach's alpha coefficients above 0.70. In this study, only the first section was used and the patient was classified into one of these three groups according to therapy notes.

**Statistical analysis:** Statistical analyses were conducted using SPSS version 22.0 for Windows. Quantitative variables were summarized as mean ± standard deviation or median with minimum and maximum values, while qualitative variables were presented as frequencies and percentages. The normality of numerical data distribution was

assessed using the Kolmogorov-Smirnov test, and variance homogeneity was evaluated with the Levene test. Although normal distribution was observed in BDI and BAI scores and age, non-parametric statistical methods were preferred owing to the small sample size. Spearman's rank correlation was utilized to analyze associations between numerical variables. Participants were divided into three groups based on attachment style (secure, avoidant, or anxious-ambivalent) and into two groups according to maternal separation characteristics (prolonged separation vs. recurrent brief separations). For comparisons between two groups, the Mann-Whitney U test was applied, and for comparisons among more than two independent groups, the Kruskal-Wallis test was used. Chi-square tests were conducted for analysis of categorical variables, with statistical significance defined as  $p < 0.05$ .

## Results

**Demographic and clinical characteristics:** It was found that four patients experienced separation due to the death of their mothers. The remaining separations were attributed to

circumstances related to the mother's employment, necessitating alternative childcare arrangements. Sixty one patients between the ages of 18-65 who applied to the outpatient clinic with symptoms of depression and/or anxiety and experienced maternal separation in the first three years of life participated in this study. Demographic and clinical characteristics of the study population are presented in Table 1. The sample consisted of 42 women (68.9%) and 19 men (31.1%). The mean age of the sample was  $39.21 \pm 9.38$  (median=38.5) years. It was observed that 90.2% of the patients had middle or upper middle income and 67.2% of them grew up in urban areas. The duration of separation data could be collected only for the group experiencing long-term separation ( $n=34$ ) and the mean duration of separation was  $18.32 \pm 9.79$  (median=20) months. Mean scores of the clinical scales (BDI= $33.82 \pm 9.61$ , BAI= $25.71 \pm 10.22$ ) were calculated.

**Relationship of of clinical scale scores with other clinical variables:** The relationship between age, the total score of BDI, BAI and the clinical variables of the patients (gender, social environment at childhood, current social environment, whether maternal separation occurs during the first year of life) were studied and the analysis was conducted using the Spearman's correlation test. The total score of BDI had a positive correlation with the total score of BAI ( $r=0.414$ ,  $p=0.001$ ). According to gender, it was seen that there was no significant difference in the

total score of BDI ( $31.48 \pm 9.69/31.32 \pm 9.14$ ;  $p=0.95$ ) and BAI ( $28.07 \pm 10.16/33.32 \pm 9.2$ ;  $p=0.05$ ). When investigated according to the social environment in which one grew up (urban/rural) there was no significant difference in the total score of BDI ( $31.66 \pm 9.86/30.95 \pm 8.76$ ;  $p=0.724$ ) and BAI ( $30.07 \pm 9.63/28.95 \pm 11.22$ ;  $p=0.612$ ). When evaluated in terms of the current social environment also there was no significant difference in the total score of BDI ( $31.07 \pm 9.44/38.33 \pm 7.64$ ;  $p=0.171$ ) and BAI ( $29.57 \pm 10.27/32.33 \pm 6.43$ ;  $p=0.726$ ). Whether the maternal separation occurred in the first year of life (yes/no), there was a significant difference in the total score of BDI ( $33.87 \pm 9.26/27.39 \pm 8.47$ ;  $p=0.008$ ) but no significant difference in the total score of BAI ( $30.82 \pm 10.29/27.87 \pm 9.71$ ;  $p=0.301$ ) was found. Because of the difficulty of retrospectively calculating the total duration of separation accurately in the group of patients who experienced short-term repeated separations, the relationship between the duration of separation and other clinical variables was examined only in the group of patients who experienced long-term separations ( $n=34$ ). There was no correlation between the duration of separation and BDI ( $r=0.097$ ,  $p=0.585$ ) or BAI ( $r=-0.074$ ,  $p=0.676$ ). There was no significant difference in the duration of separation, according to gender (female/ male;  $19.52 \pm 10/15 \pm 8.85$ ;  $p=0.226$ ) and attachment type (secure/ avoidant/ anxious-ambivalent;  $21.25 \pm 12.27/14.23 \pm 8.58/20.33 \pm 5.77$ ;  $p=0.174$ ).

**Table 2:** Comparison of Clinical Variables in Groups Separated According to Type of Separation

|                                   | Repeated Separations<br>(n=27) | Long-term Separation<br>(n=34) |         |
|-----------------------------------|--------------------------------|--------------------------------|---------|
|                                   |                                | n (%)                          | p*      |
| Gender                            |                                |                                |         |
| Female                            | 17 (40.48)                     | 25 (59.52)                     |         |
| Male                              | 10 (52.63)                     | 9 (47.37)                      | p=0.376 |
| Social environment<br>(childhood) |                                |                                |         |
| Urban                             | 21 (51.22)                     | 20 (48.78)                     |         |
| Rural                             | 6 (30)                         | 14 (70)                        | p=0.117 |
| AAS Group                         |                                |                                |         |
| Secure                            | 9 (42.86)                      | 12 (57.14)                     |         |
| Avoidant                          | 2 (13.33)                      | 13 (86.67)                     |         |
| Anxious-ambivalent                | 16 (64)                        | 9 (36)                         | p=0.008 |
| <b>Mean±SD</b>                    |                                |                                |         |
| Age                               | $38.7 \pm 8.9$                 | $39.21 \pm 9.38$               | p**     |
| BDI                               | $28.41 \pm 8.46$               | $33.82 \pm 9.61$               | p=0.954 |
| BAI                               | $34.74 \pm 7.45$               | $25.71 \pm 10.22$              | p=0.038 |
|                                   |                                |                                | p=0.001 |

\*Pearson's Chi-Square Test \*\*Mann-Whitney U Test Mann-Whitney U Test **BDI:** Beck Depression Inventory, **BAI:** Beck Anxiety Inventory, **AAS:** Adult Attachment Scale

**Table 3:** Comparison of Clinical Variables in Groups Separated According to Type of Attachment

| AAS Group                      | Secure<br>(n=21) | Avoidant<br>(n=15) | Anxious-ambivalent<br>(n=25) |                |
|--------------------------------|------------------|--------------------|------------------------------|----------------|
| n (%)                          |                  |                    |                              | p*             |
| Gender                         |                  |                    |                              |                |
| Female                         | 14 (33.33)       | 12 (28.57)         | 16 (38.1)                    | p=0.551        |
| Male                           | 7 (36.84)        | 3 (15.79)          | 9 (47.37)                    |                |
| Social environment (childhood) |                  |                    |                              |                |
| Urban                          | 13 (31.71)       | 10 (24.39)         | 18 (43.9)                    | p=0.767        |
| Rural                          | 8 (40)           | 5 (25)             | 7 (35)                       |                |
| Within first year of life      |                  |                    |                              |                |
| Yes                            | 17 (44.74)       | 7 (18.42)          | 14 (36.84)                   | p=0.078        |
| No                             | 4 (17.39)        | 8 (34.78)          | 11 (47.83)                   |                |
| Mean±SD                        |                  |                    |                              | p**            |
| Age                            | 42.1 ± 8.82      | 37.2 ± 9.04        | 37.44 ± 9.02                 | p=0.229        |
| BDI                            | 26.76 ± 7.54     | 35.67 ± 8.16       | 32.8 ± 10.22                 | <b>p=0.012</b> |
| BAI                            | 25.9 ± 11.21     | 30.33 ± 10.87      | 32.52 ± 7.75                 | p=0.083        |

\*Pearson's Chi-Square Test    \*\*Kruskal-Wallis Test, **BDI**: Beck Depression Inventory, **BAI**: Beck Anxiety Inventory, **AAS**: Adult Attachment Scale

**Comparison of clinical variables in groups separated according to type of separation:** The patients were divided into two groups according to the feature of maternal separation (repeated separations or long-term separation). The patients in groups were compared in terms of clinical variables (gender, age, social environment at childhood, type of attachment, total score of BDI, BAI). There was a statistically significant difference in terms of the total score of BDI ( $p=0.038$ ) and BAI ( $p=0.001$ ). While the mean score of BDI was higher in the group of long-term separation, the mean score of BAI was higher in the group of repeated separations. A total of 86.67% of patients who had an avoidant attachment had a history of long-term separation; on the other hand 36% of patients who had an anxious-ambivalent attachment had long-term separation while 64% of them had a history of repeated separations. There were no significant differences considering gender, age and social environment at childhood (Table 2).

**Comparison of clinical variables in groups separated according to type of attachment in adulthood:** The patients were divided into three groups according to their attachment style in their relationships (secure/ avoidant/ anxious-ambivalent). The patients in groups were compared in terms of clinical variables (gender, age, social environment at childhood, whether maternal separation occurs during the first year of life, total score of BDI, BAI). There was a

statistically significant difference in terms of the total score of BDI ( $p=0.012$ ), the highest mean score was at the avoidant group and the lowest mean score was at the secure group. Following the significant Kruskal–Wallis test result for BDI scores, post hoc pairwise comparisons were performed using Bonferroni-adjusted Mann–Whitney U tests to control for Type I error. The analysis revealed a statistically significant difference between the secure and avoidant attachment groups ( $U = 66.50$ ,  $p = 0.003$ ). However, the comparisons between the secure and anxious-ambivalent groups, as well as between the avoidant and anxious-ambivalent groups, did not reach statistical significance after Bonferroni correction (adjusted  $\alpha = 0.017$ ). There were no significant differences considering gender, age, social environment at childhood, presence of maternal separation at the first year of life and the total score of BAI (Table 3).

## Discussion

This study examined the long-term psychological consequences of early maternal separation on adult attachment styles and depressive symptoms. The findings indicate that maternal separation during the first year of life is associated with increased vulnerability to depressive symptoms and a predominance of avoidant attachment styles in adulthood, underscoring the pivotal role of early caregiving experiences in shaping emotional regulation and interpersonal functioning later in

life. The study sample primarily consisted of individuals with high educational attainment and socioeconomic status, reflecting the demographic profile of the clinical center from which data were collected. Notably, most participants belonged to the X and Y generations, raised during a period when awareness of the significance of early mother-child bonding was limited, and maternal employment was less prevalent. This was considered both a distinguishing contribution of the study, by focusing on a specific subgroup within the population in the context of maternal separation with fewer confounding childhood adversities, and a limitation in terms of generalizability. Correlation analyses revealed a significant association between depressive and anxiety symptoms, highlighting the common comorbidity within this population. Importantly, maternal separation in the first year was linked specifically to greater depressive symptom severity but did not exhibit a similar relationship with anxiety measures. When differentiating between separation types, individuals experiencing prolonged maternal separation demonstrated significantly higher depression scores, whereas those subjected to repeated short-term separations exhibited elevated anxiety symptoms. These differential outcomes may suggest that the nature and duration of early separation experiences exert distinct influences on adult psychopathology. Within the prolonged separation subgroup, no statistically significant relationship was observed between separation duration and symptom severity or attachment style; however, a moderate, non-significant correlation with anxiety symptoms warrants further investigation in larger samples. The absence of significant findings may reflect limited statistical power or the potential buffering effect of stable alternative caregiver relationships. The current findings align with previous research demonstrating the adverse cognitive and emotional sequelae of early caregiver separation (9). Similarly, LeMoult et al. (10) found that early life stress, especially disruptions in attachment, increases the risk of depression in later developmental periods. Moreover, they corroborate the critical role of early maternal bonding in fostering secure attachment and emotional resilience, consistent with established attachment theory and neurodevelopmental models (9–13).

**Study limitations:** This study has several methodological limitations. The retrospective design precludes causal inferences and introduces potential recall bias regarding early separation experiences. Attachment classification relied on

clinical records rather than standardized, validated instruments, potentially limiting diagnostic accuracy. Additionally, the single-center sample, predominantly drawn from high socioeconomic backgrounds, restricts the generalizability of findings to more diverse populations. Subgroup analyses further reduced statistical power, increasing the likelihood of Type II errors. Future research employing prospective longitudinal designs, multi-site recruitment, and standardized attachment assessments is needed to validate and extend these findings.

## Conclusion

This study highlights the differential psychological impacts of early maternal separation, demonstrating that prolonged separation is more strongly associated with depressive symptoms and avoidant attachment, while repeated short-term separations relate to heightened anxiety and anxious-ambivalent attachment. These findings emphasize the need for early, targeted interventions to support caregiver-infant bonding and promote emotional resilience. From a broader perspective, the results have significant clinical and policy implications, supporting the development of preventive frameworks such as early risk screening, parental support programs, and caregiver training to buffer against long-term mental health vulnerabilities arising from early relational disruptions.

## Ethics approval and consent to participate:

The study has a retrospective design, data were anonymized when collected from records. The sociodemographic and clinical information was obtained from the patient files. Since the data were collected retrospectively from the electronic health records, the informed consent form was not obtained from the patients, due to characteristics and the design of the study TOBB University of Economics and Technology Scientific Research Ethics Committee waived the consent from participants. Personal information that would reveal the identities of the individuals was not included in the study. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the Helsinki declaration and its later amendments or comparable ethical standards.

**Competing interests:** No conflict of interest.

**Funding:** There are no funding sources to declare.

**Authors' contributions:** G.G., designed the study, collected data from patients who evaluated

by G.G. in the clinic during three years, G.G. performed the analysis, drafted the manuscript and designed the tables, discussed the results, wrote and reviewed the manuscript.

**Acknowledgements:** I would like to thank to my dear mother Hayriye Bostankolu.

## References

1. Thompson RA. Attachment theory and research. In: Lewis M, editor. *Child and Adolescent Psychiatry*. 3rd ed. Philadelphia (PA): Lippincott Williams & Wilkins; 2002. p. 164–72.
2. Nakash-Eisikovits O, Dutra L, Westen D. Relationship between attachment patterns and personality pathology in adolescents. *J Am Acad Child Adolesc Psychiatry* 2002;41(9):1111–1123.
3. Bretherton I. The origins of attachment theory: John Bowlby and Mary Ainsworth. *Dev Psychol* 1992;28(5):759–775.
4. Bowlby J. The nature of the child's tie to his mother. *Int J Psychoanal* 1958;39:1–23.
5. Bowlby J. Separation anxiety. *Int J Psychoanal* 1959;41:1–25.
6. Ainsworth MD, Blehar MC, Waters E, Wall S. *Patterns of Attachment: A Psychological Study of the Strange Situation*. Hillsdale (NJ): Erlbaum; 1978.
7. Hazan C, Shaver P. Romantic love conceptualized as an attachment process. *J Pers Soc Psychol* 1987;52(3):511–524.
8. Bartholomew K, Horowitz LM. Attachment styles among young adults: a test of a four-category model. *J Pers Soc Psychol* 1991;61(2):226–244.
9. Zhao X, Liu J, Wang M, Tao F, Sun Y. Childhood separation from parents with cognitive and psychopathological outcomes in adolescence. *Developmental Science* 2022;25(6):e13324.
10. LeMoult J, Humphreys KL, Tracy A, Hoffmeister JA, Ip E, Gotlib IH. Meta-analysis: Exposure to early life stress and risk for depression in childhood and adolescence. *J Am Acad Child Adolesc Psychiatry* 2020;59(7):842–855.
11. Bellis MA, Hughes K, Ford K, Ramos Rodriguez G, Sethi D, Passmore J. Life course health consequences and associated annual costs of adverse childhood experiences across Europe and North America: A systematic review and meta-analysis. *Lancet Public Health* 2019;4(10):e517–528.
12. Narayan AJ, Lieberman AF, Masten AS. Intergenerational transmission and prevention of adverse childhood experiences (ACEs). *Clin Psychol Rev* 2021;85:101997.
13. Zhang ZZ, Bayly BL. Patterns of early childhood adversity and neighborhood deprivation predict unique challenges in adolescence: A UK birth cohort study. *Dev Psychopathol* 2025;37(3):1543–1555.
14. Zhang Y, Wang S, Hei M. Maternal separation as early-life stress: mechanisms of neuropsychiatric disorders and inspiration for neonatal care. *Brain Res Bull* 2024; 217: 111058.
15. Sanchez EO, Bangasser DA. The effects of early life stress on impulsivity. *Neurosci Biobehav Rev*. 2022;137:104638.
16. Suniega EA, Krenek L, Stewart G. Child abuse: Approach and management. *Am Fam Physician*. 2022;105(5):521–8.
17. Lilliesköld S, Lode-Kolz K, Rettedal S, Lindstedt J, Linnér A, Markhus Pike H et al. Skin-to-skin contact at birth for very preterm infants and mother-infant interaction quality at 4 months: A secondary analysis of the IPISTOSS randomized clinical trial. *JAMA Netw Open*. 2023;6(11):e2344469.
18. Herzberg MP, Gunnar MR. Early life stress and brain function: activity and connectivity associated with processing emotion and reward. *Neuroimage* 2020;209:116493.
19. Sandi C, Haller J. Stress and the social brain: behavioural effects and neurobiological mechanisms. *Nat Rev Neurosci* 2015;16(5):290–304.
20. van Bodegom M, Homberg JR, Henckens MJA. Modulation of the hypothalamic-pituitary-adrenal axis by early life stress exposure. *Front Cell Neurosci*. 2017;11:87.
21. Elzinga BM, Roelofs K, Tollenaar MS, Bakvis P, van Pelt J, Spinhoven P. Diminished cortisol responses to psychosocial stress associated with lifetime adverse events: a study among healthy young subjects. *Psychoneuroendocrinology*. 2008;33(2):227–37.
22. Daskalakis NP, Bagot RC, Parker KJ, Vinkers CH, de Kloet ER. The three-hit concept of vulnerability and resilience: toward understanding adaptation to early-life adversity outcome. *Psychoneuroendocrinology*. 2013;38(9):1858–73.

23. Fine R, Zhang J, Stevens HE. Prenatal stress and inhibitory neuron systems: implications for neuropsychiatric disorders. *Mol Psychiatry*. 2014;19(6):641–51.
24. Varghese FP, Brown ES. The hypothalamic-pituitary-adrenal axis in major depressive disorder: A brief primer for primary care physicians. *Prim Care Companion J Clin Psychiatry*. 2001;3(4):151–5.
25. Faravelli C, Lo Sauro C, Godini L, Lelli L, Benni L, Pietrini F et al. Childhood stressful events, HPA axis, and anxiety disorders. *World J Psychiatry*. 2012;2(1):13–25.
26. Genty J, Tetsi Nomigni M, Anton F, Hanesch U. The combination of postnatal maternal separation and social stress in young adulthood does not lead to enhanced inflammatory pain sensitivity and depression-related behavior in rats. *PLoS One*. 2018;13(8):e0202599.
27. Beck AT, Ward CH, Mendelson M, Mock J, Erbaugh J. An inventory for measuring depression. *Arch Gen Psychiatry*. 1961;4:561–71.
28. Hisli N. Beck Depresyon Envanterinin üniversite öğrencileri için geçerliliği, güvenirliği. *Psikoloji Dergisi*. 1989;7:3–13.
29. Beck AT, Epstein N, Brown G, Steer RA. An inventory for measuring clinical anxiety: psychometric properties. *J Consult Clin Psychol*. 1988;56(6):893–7.
30. Ulusoy M, Şahin N, Erkman H. Turkish version of the Beck Anxiety Inventory: psychometric properties. *J Cogn Psychother Int Q*. 1998;12:28–35.