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EDİTÖRDEN / EDITORIAL

Değerli Meslektaşlarım ve Alanımızın Değerli Profesyonelleri,

İçerik bakımından oldukça dolu olan 2026 yılının ikinci sayısı ile karşınızdayız. Sayımız çatışma bölgelerinde yaşayan çocuklara verilen travma odaklı ruh sağlığı hizmetlerini nörogörüntüleme bulguları ile ilişkilendiren bir gözden geçirme ile başlamaktadır. Bu gözden geçirme ve çocuk ve ergenlerde ruhsal bozuklukların tedavisi ve yönetiminde lurasidonun etkinliğini değerlendiren diğerinin sonuçlarının klinik uygulamalar açısından faydalı olacağını umuyoruz.

Hem olağan çocuk gelişimi hem de çocuklarda ruhsal bozuklukların etiyolojisinde önemli rol alan ebeveynlik bu sayımızdaki üç özgün çalışmada değerlendirilmektedir. Bu çalışmalardan ilkinde helikopter ebeveynlik, ikincisinde ise çocuklarda sorunlu ekran kullanımı ve ebeveynlikle ilişkisi değerlendirilmektedir. Ebeveynlikle ilgili üçüncü çalışmada ise anne ve babaların oyun çağı çocukları ile etkileşimi karşılaştırılmakta ve bu etkileşimi değerlendirmek amacıyla geliştirilmiş özgün bir ölçme aracı tanıtılmaktadır. Bu üç çalışmaya ek olarak aile duygularını değerlendirme envanterinin geçerlik ve güvenirliğini değerlendiren çalışmanın sonuçlarının ebeveynlerle çalışan çocuk ve ergen ruh sağlığı ve hastalıkları uzmanları için faydalı olacağını düşünüyoruz.

Geç ergenlik ve genç erişkinlik ruhsal bozuklukların gelişiminde önemli bir yaşam evresidir. Bu sayımızdaki iki özgün çalışmada bu yaşam evresinde aşırı sorumluluk duygusuyla ilişkili etkenler ve çocukluk çağı travmalarının emosyonel zekaya etkisi ele alınmıştır. Çocuklukta cinsel taciz maruziyetinde teknolojik faktörler ve sağlık tedbiri kapsamında takip edilen çocukların özelliklerini değerlendiren çalışmalar çocukluk çağındaki travmalarla ilgili temayı devam ettirmektedir. Bu sayımızdaki son özgün çalışma ise primer enürezis noktürnası olan bir geniş bir ailenin tüm ekzom dizilemesini değerlendirme açısından yazında ilk olma özelliğini taşımaktadır. Çocuk ve ergenlerde antibiyotik kullanımı nadiren duygu durum epizodları ile ilişkilendirilebilmektedir. Bu sayımızda bir çocukta klaritromisin- amoksisilin kullanımı ile ilişkilendirilen, yineleyen psikotik mani olgusu sunulmuştur.

Dergimize hem ulusal hem de uluslararası ilgi ve talebin artmaya devam ettiğini mutlulukla gözlemekteyiz. Bu süreçte katkıları olan tüm yazarlar, hakemler, yardımcı editörler, editörler kurulu üyeleri ve vekil editör Prof. Dr. Sevay ALŞEN GÜNEY'e teşekkür ediyor, keyifli okumalar diliyorum.

En içten sevgi ve saygılarımla,
Prof. Dr. Ali Evren TUFAN

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Rethinking Trauma Care for Children in Conflict Zones: The Imperative of Neuroimaging Insights

Çatışma Bölgelerindeki Çocuklar için Travma Bakımını Yeniden Düşünmek: Nörogörüntüleme Bulgularının Önemi

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ABSTRACT

Children living in conflict areas experience a covert traumatic crisis that affects them psychologically and neurologically. This study examines the importance of neuroimaging for understanding the effects of childhood trauma on the prefrontal cortex, amygdala, and hippocampus. This review, which draws on findings from functional magnetic resonance imaging research, focuses on quantifiable alterations linked to depression and post-traumatic stress disorder, including amygdala hyperactivity and hippocampal atrophy. These results highlight the dual nature of trauma as a neurological and mental health issue that calls for multidisciplinary, trauma-informed care. The transformative potential of eye movement desensitization and reprocessing and cognitive behavioral therapy, which have shown promise in enhancing brain function and alleviating psychological symptoms, is further explored in the study. Although there are many obstacles to care in conflict areas, such as a lack of resources and limited access to services, incorporating neuroimaging into trauma therapy presents a viable avenue for delivering individualised and effective care. This study promotes international cooperation to close the resource gap, implement culturally aware interventions, and prioritise neurobiologically informed care. Children in areas devastated by war can find hope and healing by addressing the complex effects of trauma through a comprehensive framework that combines neuroimaging and tailored therapy.

Keywords: Neuroimaging, trauma-informed therapy, childhood PTSD

ÖZ

Çatışma bölgelerinde yaşayan çocuklar, onları hem psikolojik hem de nörolojik olarak etkileyen gizli bir travmatik kriz yaşamaktadır. Bu çalışma, çocukluk çağı travmasının prefrontal korteks, amigdala ve hipokampus üzerindeki etkilerini anlamada nörogörüntülemenin önemini incelemektedir. Fonksiyonel manyetik rezonans görüntüleme araştırmalarından elde edilen bulgulara dayanan bu derleme, depresyon ve travma sonrası stres bozukluğu ile ilişkili ölçülebilir değişimlere, özellikle amigdala hiperaktivitesi ve hipokampal atrofiye odaklanmaktadır. Bu bulgular, travmanın nörolojik ve ruh sağlığıyla ilgili çift yönlü doğasını vurgulamakta ve disiplinlerarası, travma odaklı bir bakım yaklaşımını gerekli kılmaktadır. Çalışmada ayrıca, beyin fonksiyonlarını iyileştirme ve psikolojik semptomları azaltma konusunda umut vaat eden göz hareketleriyle duyarsızlaştırma ve yeniden işleme ile bilişsel davranışçı terapinin dönüştürücü potansiyeli ele alınmaktadır. Çatışma bölgelerinde kaynak yetersizliği ve hizmetlere sınırlı erişim gibi birçok engel bulunsa da, nörogörüntülemenin travma terapisine entegre edilmesi, bireyselleştirilmiş ve etkili bakım sunma açısından umut verici bir yol sunmaktadır. Bu çalışma, kaynak açığını kapatmak, kültürel olarak duyarlı müdahaleleri hayata geçirmek ve nörobiyolojik temelli bakımı önceliklendirmek için uluslararası iş birliğini teşvik etmektedir. Savaşın yıkıma uğrattığı bölgelerdeki çocuklar, nörogörüntüleme ve kişiselleştirilmiş terapileri birleştiren kapsamlı bir yaklaşım sayesinde umut ve iyileşme bulabilir.

Anahtar Kelimeler: Nörogörüntüleme, travma odaklı terapi, çocukluk çağı TSSB

Introduction

The psychological and physiological consequences of child victimization in conflict zones demand urgent attention, particularly in regions such as Afghanistan, Syria, Palestine, Kashmir, and parts of Africa, where ongoing violence, displacement, and trauma are rampant. Understanding these impacts requires a multifaceted approach that considers both the psychological suffering and the neurophysiological alterations in the brains of children exposed to these traumatic experiences. Trauma does not solely manifest as a mental health crisis but also as a physical one, fundamentally altering brain structure and function, especially in regions critical for executive control, emotional regulation, and memory.[1,2]

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Research has shown that childhood trauma, particularly exposure to violence, displacement, and repeated disruptions, places children at increased risk of developing severe mental health disorders, including post-traumatic stress disorder (PTSD) and depression.[1,3] These disorders affect children's emotional well-being and have long-term implications for their cognitive and neurological development. The neuroimaging data from various studies, particularly those involving functional magnetic resonance imaging (fMRI), provide invaluable insights into the direct impact of trauma on the developing brain. These studies reveal measurable changes in brain structures, such as the hippocampus, amygdala, and prefrontal cortex, all of which are crucial for memory processing, emotional regulation, and decision-making.[4,5] These neurophysiological shifts are often linked to impaired executive functioning and an inability to regulate emotions effectively, conditions commonly observed in children who have experienced trauma in conflict zones.

The importance of neuroimaging in trauma care cannot be overstated, as it offers a critical tool for understanding the full scope of trauma's effects on children. Neuroimaging techniques, such as fMRI, can provide real-time data on how trauma alters the brain's neural pathways, thereby allowing clinicians to better tailor interventions based on each child's specific needs.[4] By incorporating neurological assessments into trauma-informed therapies, healthcare providers can address both the psychological and physiological aspects of trauma, offering a more holistic approach to care. This is particularly important in conflict zones, where access to mental health services is often limited and where children may face compounded challenges due to ongoing violence, displacement, and scarcity of resources.[6]

Furthermore, neuroimaging can enhance the efficacy of existing therapies, such as cognitive-behavioral therapy (CBT) and eye movement desensitization and reprocessing (EMDR), by providing evidence of how these therapies affect brain activity. Studies have shown that both CBT and EMDR can significantly alter neural activity in the brain regions associated with trauma.[4,5] This opens up new avenues for integrating neurofeedback and other brain-based therapeutic approaches into trauma treatment, potentially accelerating the healing process for children affected by conflict.

Despite the promising potential of neuroimaging in trauma care, significant barriers persist to the provision of adequate mental health services in conflict zones. In many parts of the world, including those affected by war and instability, the availability of mental health professionals, particularly those trained in neuroimaging, is extremely limited. This creates a critical need for international efforts to bridge gaps and to provide children in these regions with access to high-quality trauma care. Programs that facilitate cross-border cooperation and telemedicine initiatives could provide a pathway for delivering trauma-informed, brain-based therapy to children in need, even in the most remote and conflict-affected areas.[7]

Overall, there is a growing recognition of the importance of neuroimaging in understanding and treating childhood trauma, particularly in conflict zones. This research advocates for the integration of neuroimaging into trauma-informed therapies to provide a more comprehensive and practical approach to healing. The ultimate goal is to develop an interdisciplinary treatment framework that addresses the complex psychological and physiological impacts of trauma and offers hope and recovery to children affected by conflict worldwide.

The Hidden Crisis of Childhood Trauma in Conflict-Affected Areas

The need for a sustained and globally coordinated response to the psychological and neurological impact of conflict on children in Afghanistan, Syria, Palestine, Kashmir, and countries in Africa cannot be overstated.[8-10] Children residing in conflict zones experience ongoing exposure to violence, forced migration, and chronic instability, thereby significantly increasing their vulnerability to persistent psychiatric disorders, including PTSD and depression.[11,12]

Research utilizing neuroimaging, especially fMRI, has provided compelling evidence of the profound impact of trauma on children's psychological and neurobiological development. These studies have revealed measurable alterations in brain structures critical for emotional regulation and cognitive functions. For instance, trauma has been linked to decreased hippocampal volume—a brain region essential for memory processing and emotional regulation—and heightened amygdala activity, which is associated with fear and threat responses.[13,14] Such findings underscore the severe neurological toll that trauma exacts on children in these environments.

MRI studies focusing on conflict-affected children across multiple regions provide further insights into the neurobiological signature of trauma. Palestinian children exposed to sustained violence exhibit significant reductions in hippocampal volume (average reduction, 12%) and increased amygdala activity (14-30%).[15-17] These structural and functional changes are not merely academic findings; they closely correlate with clinical manifestations of PTSD, such as hypervigilance, emotional dysregulation, and difficulty in forming secure attachments.

The evidence from conflict-affected areas, particularly Kashmir, mirrors these global trends. Studies conducted in the region highlight the pervasive psychological impact on children exposed to prolonged violence and insecurity, further validating the necessity for targeted interventions.[6,18] Neuroimaging studies in this context have demonstrated similar patterns of hippocampal atrophy and hyperactive amygdala responses, further affirming the universal neurobiological impact of trauma across cultural and geographical boundaries.

Neuroimaging as a Perspective on Trauma's Neurobiological Signature

Neuroimaging studies have provided invaluable insights into the profound and specific impact of trauma on children's developing brains. Functional and structural imaging modalities such as fMRI and MRI have revealed measurable alterations in key brain regions, including the prefrontal cortex, amygdala, and hippocampus, which are pivotal for memory processing, emotional regulation, and executive functioning.[19,20]

These studies demonstrate that trauma is not merely a psychological construct but a neurobiological phenomenon with distinct patterns of brain dysfunction. For example, the prefrontal cortex, responsible for higher-order cognitive processes and impulse control, often shows reduced function in children exposed to chronic stress and violence, resulting in impaired decision-making and heightened emotional reactivity. Similarly, the amygdala, which governs fear and threat responses, shows hyperactivity in trauma-exposed children, a hallmark of PTSD symptomatology that includes hypervigilance and emotional dysregulation.[20]

Hippocampal atrophy is another consistent finding in neuroimaging studies. This brain region, essential for memory consolidation and for distinguishing real from perceived threats, exhibits significantly reduced volume in children affected by trauma. Studies focusing on Palestinian children exposed to protracted conflict report a 12% average hippocampal volume loss and a 14-30% increase in amygdala activity.[15-17] These structural changes are not isolated phenomena but are closely correlated with clinical manifestations such as impaired memory recall, avoidance behaviors, and exaggerated fear responses.

The alignment between neurobiological abnormalities and clinical symptoms strengthens the case for integrating neuroimaging into trauma-focused therapeutic approaches. For instance, hyperactivity of the amygdala observed in conflict-affected children may underlie their heightened emotional arousal and difficulties with emotion regulation. At the same time, the diminished hippocampal volume underscores challenges in memory retention and processing. This neurobiological perspective provides a foundation for tailoring therapeutic interventions, ensuring they address not only the psychological but also the neurological dimensions of trauma.

Therapeutic Interventions and the Potential for Neurobiological Recovery

Evidence from neuroimaging also emphasizes the potential for neurobiological recovery through focused therapy approaches. CBT and EMDR have been associated with improvements in brain structure and function.[21] Clinical studies suggest that CBT leads to increased hippocampal volume, decreased amygdala reactivity, and substantial reductions in PTSD and depression symptoms, with reported decreases of 35% and 28% for PTSD and depression, respectively.[22-24]

EMDR

EMDR is primarily used to treat children with trauma or PTSD. This method facilitates the processing of distressing memories by engaging the brain's natural healing mechanisms, often leading to more rapid symptom relief. A significant advantage of EMDR is its reduced reliance on verbal communication, making it particularly suitable for younger children or those who struggle to articulate their feelings. However, it is not without challenges. EMDR can evoke strong emotions during processing, requiring therapists to manage sessions carefully and to have specialized training in working with children. EMDR is effective in alleviating specific PTSD symptoms, including avoidance, hyperarousal, and re-experiencing.

However, children with severe developmental challenges or those unable to cope with the intense emotional content of trauma may not benefit as much from EMDR. In studies from Kashmir, EMDR contributed to a 33% reduction in PTSD symptoms and a 28% reduction in depressive symptoms.[25] These rates primarily reflect improvements in hyperarousal and re-experiencing symptoms, although detailed symptom-level data require further exploration.

CBT

CBT is a versatile and evidence-based therapeutic method effective for a wide range of mental health concerns, such as anxiety, depression, and behavioral issues. It focuses on teaching children coping mechanisms and problem-solving skills, contributing to their long-term mental well-being. Although adaptable to different age groups, CBT requires verbal communication and cognitive understanding; these requirements may limit its applicability for young children or those with developmental delays. CBT has demonstrated significant efficacy in addressing specific symptoms, including

Anhedonia, Negative Thinking Patterns, Hyperarousal and Emotional Regulation

In the same studies conducted in Kashmir, CBT was associated with a 33% reduction in PTSD symptoms and a 28% reduction in depressive symptoms.[25] These effects were particularly evident in reducing children's anhedonia and negative cognitive patterns.

Comparative Inclusion and Exclusion Criteria

To optimize therapy selection, explicit inclusion and exclusion criteria should be established:

- EMDR is suitable for children with trauma histories, especially those who struggle with verbal communication or who experience avoidance behaviors and hyperarousal. It is less appropriate for children with severe developmental impairments or for those who may find the emotional intensity overwhelming.

- CBT: Ideal for children who can engage in dialogue and cognitive restructuring, particularly those with anxiety or depression manifesting as anhedonia or negative thought patterns. However, it may not be suitable for children with significant cognitive impairments or those requiring rapid symptom relief.

A comprehensive assessment by a qualified mental health professional is essential to determine the most appropriate therapy tailored to each child's unique needs. By understanding the symptom-specific advantages and limitations of EMDR and CBT, clinicians can enhance treatment outcomes. Further research and clinical insights are necessary to refine inclusion criteria and better understand the symptom-level impacts of these therapies. Studies should aim to provide detailed symptom-specific data, clarifying which approach is more beneficial for PTSD symptoms (e.g., avoidance, hyperarousal) and depressive symptoms (e.g., anhedonia). These efforts will

ultimately support the development of more personalized, effective therapeutic interventions for children facing diverse mental health challenges (Table 1).[25]

The Imperative for Integrating Neuroimaging in Trauma-Centered Care

The evolving field of neuroimaging has the potential to transform trauma-centered care, particularly in conflict-affected settings. By providing precise, measurable insights into the neurobiological impact of trauma, neuroimaging technologies such as fMRI and MRI enable clinicians to monitor changes in brain structure and function over time. These advancements are not merely diagnostic tools but also foundational for developing adaptive therapy models tailored to the individual neurobiological consequences of trauma.[26]

One of the most compelling applications of neuroimaging is its ability to elucidate the relationship between key brain regions affected by trauma, such as the amygdala and the prefrontal cortex. In children exposed to chronic conflict, the amygdala often exhibits hyperactivity, leading to heightened fear responses and emotional dysregulation. Simultaneously, the prefrontal cortex, responsible for higher-order cognitive functions and emotional regulation, shows reduced functionality due to the chronic stress associated with traumatic experiences. Functional imaging studies in war-affected populations have demonstrated that therapeutic interventions, such as CBT, can enhance connectivity between these two regions. This enhancement is associated with improved emotional regulation and a reduction in PTSD symptoms, offering a neurobiological basis for the observed clinical improvements (Table 2).[27]

Beyond its role in understanding trauma's impact, neuroimaging facilitates the development of guided therapies that target specific brain abnormalities. For instance, interventions such as EMDR and trauma-focused CBT have shown measurable changes in brain activity. Studies have shown that these therapies can normalize hyperactive amygdala responses and improve prefrontal cortex function, thereby reinforcing resilience and emotional stability among children in conflict zones. Such findings underscore the importance of integrating neuroimaging into trauma care not only to assess baseline impairments but also to evaluate treatment efficacy over time.[26]

Moreover, neuroimaging allows for a personalized approach to therapy, moving beyond a one-size-fits-all model. By identifying the specific neural pathways affected in each child, clinicians can design targeted interventions that address both the psychological and neurological dimensions of trauma. This individualized care model is particularly critical in conflict-affected settings, where the intensity and nature of trauma can vary widely among children.

Overcoming Barriers to Access: Addressing Resource Gaps in Conflict Zones

Despite the transformative potential of neuroimaging-informed therapy, significant barriers impede its application in conflict-affected areas. These challenges are particularly pronounced in regions plagued by prolonged violence, forced displacement, and systemic instability, where mental health care remains critically under-resourced. While adjustment disorders and PTSD are expected consequences in such settings, the lack of infrastructure, trained professionals, and essential resources creates substantial obstacles to delivering comprehensive, trauma-focused care.[28]

The urgency of addressing these barriers is underscored by cross-sectional MRI findings from Afghan and Syrian youth, which reveal PTSD prevalence rates as high as 47% and significant neural alterations, including hippocampal volume reduction and hyperactivity in the amygdala. These neurobiological changes directly correlate with the severity of trauma and highlight the necessity for individualized, targeted interventions that address both psychological symptoms and underlying brain dysfunctions.[28] Without adequate support, children in these environments face a heightened risk of long-term cognitive, emotional, and behavioral impairments.

To bridge these gaps, the International Mental Health Framework advocates for a paradigm shift towards early, trauma-informed care that integrates neurobiological evaluations with culturally sensitive approaches. This framework emphasizes the need to establish community-based services supported by a multidisciplinary team of specialists, including mental health practitioners, neurologists, and social workers. Such teams can provide holistic, evidence-based interventions tailored to the unique needs of conflict-affected populations.[29]

Table 1. Therapeutic approaches and their applications

Aspect	Cognitive behavioral therapy	Trauma-informed care	Eye movement desensitization and reprocessing
Application	Addresses maladaptive thoughts and behaviors; involves psychoeducation and skill-building.	This approach recognizes trauma's impact and focuses on safety, trust, and empowerment.	Uses bilateral stimulation (eye movements) to desensitize and reprocess traumatic memories.
Typical duration	8-20 sessions, depending on complexity and severity of symptoms.	Continuous; integrated into all therapeutic practices rather than fixed-duration sessions.	6-12 sessions for most cases; varies based on trauma severity.
Target population	Suitable for all age groups, including children with trauma-related symptoms.	Applicable to all age groups; particularly effective in systemic and relational contexts.	Effective for children and adults with post-traumatic stress disorder or complex trauma.
Core focus	Modifies dysfunctional beliefs, improves emotional regulation, and builds coping skills.	Emphasizes understanding trauma's effects and fostering resilience.	Focuses on resolving unprocessed trauma and reducing distress.

Additionally, advancements in mobile neuroimaging technologies and telehealth platforms offer promising avenues for overcoming logistical constraints in resource-limited settings. Portable MRI and fMRI units, combined with remote access to trained neuroimaging analysts, can extend diagnostic and therapeutic capabilities to regions previously inaccessible to such services. These innovations also facilitate ongoing monitoring of treatment outcomes, enabling clinicians to refine interventions and ensure their effectiveness over time.

Research and Intervention in Future Directions for Students Labelled Learning Disabled

The intersection of trauma, neurodevelopment, and learning disabilities represents a critical frontier in neuroimaging research. Future research must expand the application of neuroimaging techniques in diverse conflict-affected populations, with particular focus on children identified as having learning disabilities attributable to trauma-related cognitive and emotional impairments. These efforts aim to elucidate the "neurobrisance" of injury—that is, how trauma disrupts neural development and functional capacity—and to inform targeted interventions.

Longitudinal studies are essential to understanding the long-term impact of trauma on the neural architecture and cognitive functioning of these children. Such research can reveal how therapeutic interventions, such as CBT and pharmacological treatments, influence the trajectory of brain development. For instance, studies involving Palestinian children exposed to chronic conflict have shown that six months of combined CBT and pharmacological therapy leads to significant neurobiological changes, including increased hippocampal volume and decreased amygdala hyperactivity. These findings underscore the potential for therapy to facilitate neurobiological recovery and improve learning and emotional regulation outcomes (Table 3).[30,31]

Table 2. Brain areas involved in trauma

Brain area	Amygdala	Prefrontal cortex
Primary role	Emotion regulation, especially fear and threat responses.	Higher-order cognitive functions, including decision-making, planning, and personality.
Impact of trauma	Hyperactivity in response to triggers can lead to heightened fear and anxiety.	Reduced functionality affects impulse control and emotional regulation.
Relevance to therapy	Targeted to down-regulate hyperactivity via desensitization (e.g., in eye movement desensitization and reprocessing).	Aims to strengthen functionality through coping strategies and cognitive restructuring (e.g., in cognitive behavioral therapy).

Table 3. Pharmacological treatment

Symptom	Medication class	Common medications	Remarks
Persistent sadness or low mood	Selective serotonin reuptake inhibitors (SSRIs)	Fluoxetine (prozac), sertraline (zoloft)	Fluoxetine is Food and Drug Administration-approved for children 8+ for major depressive disorder.
Loss of interest in activities	SSRIs	Escitalopram (lexapro)	May improve motivation and enjoyment in daily activities.
Irritability	SSRIs or atypical antidepressants	Fluoxetine, bupropion (wellbutrin)	Bupropion is sometimes used off-label for adolescents.
Sleep disturbances (insomnia)	Sedative-hypnotics or SSRIs	Trazodone, fluoxetine	Trazodone may be prescribed in low doses to improve sleep.
Appetite changes	SSRIs or appetite stimulants	Mirtazapine (remeron)	Mirtazapine can help with weight gain and sleep, especially if there is weight loss.
Fatigue or lack of energy	SSRIs or atypical antidepressants	Bupropion, sertraline	Bupropion may help with energy levels and focus.
Difficulty concentrating	SSRIs or stimulants	Fluoxetine, methylphenidate (ritalin)	Stimulants may be used in cases of comorbid attention deficit hyperactivity disorder.
Feelings of worthlessness or guilt	SSRIs	Fluoxetine, escitalopram	Early therapy combined with medication can help address these cognitive symptoms.
Thoughts of self-harm or suicide	SSRIs (closely monitored)	Fluoxetine, sertraline	Requires immediate intervention and monitoring for suicidal ideation.
Psychomotor agitation or retardation	SSRIs	Fluoxetine	Can reduce restlessness or slow movements.
Severe cases with lack of response	Combination therapies (SSRIs + others)	Fluoxetine + risperidone (antipsychotic)	Used in severe or treatment-resistant depression.

Additionally, neuroimaging-assisted interventions offer promising avenues for addressing the mental health needs of children from military families, who often face unique stressors related to frequent relocations, familial separations, and exposure to conflict. Research in this domain highlights the efficacy of neuroimaging-guided therapeutic approaches in enhancing emotional resilience and cognitive performance. These methods can identify specific neural deficits, such as reduced prefrontal cortex activity or impaired hippocampal functioning, and tailor interventions accordingly.

A key area for future investigation is the relationship between trauma-induced neurobiological changes and the academic performance of students labeled as learning-disabled. By integrating neuroimaging with educational assessments, researchers can better understand how trauma impacts executive functioning, memory, and attention—core skills essential for learning. Such insights can drive the development of neurobiologically informed educational strategies, including trauma-sensitive pedagogical frameworks and individualized learning plans.

Moreover, improving access to neuroimaging technologies in low-resource settings is imperative. Portable imaging devices and telehealth platforms can enable researchers and clinicians to extend their reach to underserved populations, ensuring that children in conflict-affected areas receive timely and effective interventions.

A Call to Rethink Trauma Care for Conflict-Affected Children

The growing body of neuroimaging research underscores the urgent need for a systematic, evidence-based approach to trauma care for children living in conflict zones. Neuroimaging not only highlights the profound neurobiological impacts of trauma but also offers a roadmap for targeted interventions that address both structural and functional brain impairments. These findings make it imperative to integrate psychological counseling with neurobiologically informed treatments, transforming how trauma is managed globally.

The integration of therapies such as CBT and EMDR into trauma care offers two advantages. These evidence-based approaches not only repair critical brain regions, such as the hippocampus and prefrontal cortex, but also alleviate psychological symptoms, such as hyperarousal, avoidance behaviors, and anhedonia. For instance, CBT has been shown to improve hippocampal volume and prefrontal cortex function, enhancing memory, emotional regulation, and executive control. Similarly, EMDR facilitates the desensitization of traumatic memories, normalizing hyperactivity in the amygdala and promoting resilience.[22,23]

To truly address the multifaceted needs of trauma-affected children, a reimagined global framework for trauma care is essential. This framework must prioritize:

- **Evidence-based interventions:** Ensuring widespread access to therapies like CBT and EMDR, which have demonstrated effectiveness in improving both mental health outcomes and neurobiological recovery.
- **Holistic treatment models:** Combining psychological therapies with neurobiological evaluations to create individualized care plans tailored to each child's specific needs.
- **Global funding and policy support:** Mobilizing resources to build infrastructure, train clinicians, and deploy neuroimaging technologies in conflict-affected regions.
- **Research and innovation:** Supporting longitudinal studies and clinical trials to refine existing treatments and explore novel therapeutic approaches.

The opportunity to revolutionize trauma care lies at the intersection of science, empathy, and collaboration. By committing to a multidisciplinary, globally coordinated approach, we can address the diverse requirements of trauma-affected children and foster long-term recovery and resilience. This commitment entails robust funding mechanisms, the dissemination of evidence-based, reproducible practices, and a focus on equity to ensure that even the most underserved populations benefit from advancements in trauma care.

Conclusion

Brain imaging provides an overview of the neural basis of trauma and supplies important data to inform rehabilitation approaches. Investments in early, neurobiologically-based therapies and in the promotion of holistic healthcare are not just useful but essential. Now is the time to leverage advances in science, global resources, and empathetic, tailored treatments to restore good health, adaptability, and opportunities for children who are persistently affected by violence.

Footnotes

Authorship Contributions

Concept: M.M.A., Design: M.M.A., Data Collection or Processing: M.M.A., Analysis or Interpretation: M.M.A., J.J., Literature Search: M.M.A., J.J., Writing: M.M.A., J.J.

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REVIEW / DERLEME

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Lurasidone in the Treatment of Childhood and Adolescent Psychopathology: Evidence and Emerging Perspectives

Çocukluk ve Ergenlik Dönemi Psikopatolojilerinin Tedavisinde Lurasidon: Kanıtlar ve Gelişen Perspektifler

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ABSTRACT

Lurasidone is a commonly prescribed second-generation antipsychotic used in the treatment of schizophrenia and bipolar depression in adults. Interest in using it to treat mood and psychotic disorders in children is growing. There is a dearth of information on its safety, effectiveness, and optimal use in younger populations, despite its expanding clinical use. The effectiveness, safety, and tolerability of lurasidone in the treatment of psychiatric disorders in children and adolescents are the main topics of this review. Using search terms such as "lurasidone," "antipsychotic," "bipolar," "schizophrenia," "depression," "children," and "adolescents," a thorough literature review was carried out. PsycINFO, Google Scholar, and PubMed were among the databases that were searched. Publications were analyzed for pharmacological properties, clinical efficacy, side-effect profiles, and clinical recommendations. Lurasidone has demonstrated efficacy and safety in the treatment of schizophrenia and bipolar depression in specific pediatric age groups. Common adverse effects include somnolence, extrapyramidal symptoms, akathisia, and nausea. Compared to other antipsychotics, lurasidone appears to have a limited impact on weight gain and metabolic parameters. It is generally well tolerated, with mild withdrawal symptoms upon discontinuation. This review presents current evidence regarding lurasidone use in adolescents with schizophrenia, schizoaffective disorder, and bipolar disorder. Current evidence indicates that lurasidone is a promising treatment option for children and adolescents with schizophrenia and bipolar depression, particularly due to its favorable metabolic profile and overall tolerability. However, the available studies remain limited in number and scope. Future large-scale, well-designed randomized controlled trials are essential to confirm these findings, clarify long-term safety, and establish evidence-based clinical guidelines for the use of lurasidone in pediatric populations.

Keywords: Lurasidone, treatment, psychopathology, child and adolescent

ÖZ

Lurasidon, yetişkinlerde şizofreni ve bipolar depresyon için yaygın olarak reçete edilen ikinci nesil antipsikotiklerden biridir. Pediyatrik popülasyonlarda duygu durum ve psikotik bozukluklar için kullanımı konusundaki ilgi giderek artmaktadır. Klinik uygulamalarda kullanımı artmasına rağmen, lurasidonun daha genç popülasyonlardaki etkinliği, güvenliği ve optimal kullanımıyla ilgili veriler hala oldukça sınırlıdır. Bu inceleme, lurasidonun psikiyatrik bozuklukları olan çocuklar ve ergenlerdeki kullanımını değerlendirerek etkinliğini, güvenliğini ve tolerabilitesini kapsayan bir klinik yaklaşımı incelemeyi amaçlamaktadır. İlgili literatür üzerine kapsamlı bir inceleme yapılmış olup, arama terimleri arasında "lurasidon", "antipsikotik", "bipolar", "şizofreni", "depresyon", "çocuklar" ve "ergenler" yer almıştır. PubMed, Google Scholar ve PsycINFO veritabanlarını kullanarak bir literatür taraması gerçekleştirdik ve odak noktamız, randomize kontrollü çalışmalar, açık etiketli çalışmalar, derleme makaleleri, meta-analizler ve gözlemsel çalışmalardı. Yayınlar, lurasidonun farmakolojik özellikleri, klinik etkinliği, yan etki profilleri ve klinik uygulama önerileri açısından analiz edilmiştir. Lurasidonun belirli yaş gruplarındaki çocuklar ve ergenlerde şizofreni ve bipolar depresyon tedavisinde etkili ve güvenli olduğu gösterilmiştir. Yaygın yan etkiler arasında uyku hali, ekstrapiramidal semptomlar, akatizi ve mide bulantısı yer almaktadır. Diğer antipsikotiklerle karşılaştırıldığında, lurasidonun kilo alımı ve metabolik parametreler üzerindeki etkisinin sınırlı olduğu görülmüştür. İyi tolere edilebildiği ve ilaç sonlandırıldığında ortaya çıkan yoksunluk semptomlarının nispeten hafif düzeyde olduğu bulunmuştur. Bu inceleme, lurasidonun şizofreni, şizoafektif bozukluk ve bipolar bozukluğu olan çocuklar ve ergenlerdeki kullanımına dair mevcut kanıtları ortaya koymaktadır. Mevcut veriler, lurasidonun özellikle olumlu metabolik profili ve genel tolere edilebilirliği sayesinde çocuklar ve ergenlerde şizofreni ve bipolar depresyon tedavisinde umut verici bir seçenek olduğunu göstermektedir. Bununla birlikte, mevcut çalışmaların sayısı ve kapsamı sınırlıdır. Bulguların doğrulanması, uzun dönem güvenliğin netleştirilmesi ve pediyatrik popülasyonda lurasidon kullanımına ilişkin kanıta dayalı klinik kılavuzların oluşturulabilmesi için daha geniş örneklemlerle, iyi tasarlanmış randomize kontrollü çalışmalara ihtiyaç vardır.

Anahtar Kelimeler: Lurasidon, tedavi, psikopatoloji, çocuk ve ergen

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Introduction

Mental health disorders are a significant public health concern in childhood and adolescence, with psychiatric conditions during this period having profound individual and societal consequences. Managing psychiatric disorders in children and adolescents presents greater challenges compared to adults' treatment, as the developing brain may respond differently to pharmacological interventions. Therefore, the effectiveness and safety of medications in this population must be thoroughly assessed. Second-generation antipsychotics (SGAs) are essential in managing severe psychiatric disorders, including schizophrenia and bipolar disorder.[1]

Lurasidone is a novel antipsychotic that has demonstrated effectiveness in both preventing relapses and treating acute schizophrenia. It is distinguished from other SGAs by its unique pharmacological profile, particularly its action on 5-HT7 and 5-HT1A receptors.[2] The European Medicines Agency (EMA) has approved lurasidone for the treatment of schizophrenia in adults and adolescents between the ages of 13 and 17. Additionally, the Food and Drug Administration (FDA) in the United States has approved it for the treatment of bipolar disorder and schizophrenia.[3]

Among antipsychotics used in early-onset schizophrenia, lurasidone is one of five medications (along with aripiprazole, risperidone, paliperidone, and quetiapine) that have demonstrated both efficacy and safety.[4] It has a good tolerability profile and has little impact on body weight, prolactin levels, or metabolic parameters.[5] Given the metabolic risks associated with other antipsychotics, lurasidone represents an important treatment option due to its efficacy and low side effect burden.

This review will provide a comprehensive analysis of the current evidence on lurasidone use in children and adolescents, focusing on its efficacy, safety profile, clinical applications, and comparisons with alternative treatments. By addressing gaps in the literature, we aim to highlight future research directions and explore lurasidone's potential to improve both symptoms and quality of life in this vulnerable population.

Pharmacological Profile

With binding affinities of 0.99, 0.47, and 0.50 nM for dopamine D2, serotonin 5-HT2A, and 5-HT7 receptors, respectively, lurasidone is a benzoisothiazole derivative.[6] Lurasidone blocks the alpha-2c and alpha-2a adrenergic receptors with binding affinities of 10.80 and 40.70 nM, respectively, and is a complete antagonist at the D2, 5-HT2A, and 5-HT7 receptors.[2,6] Lurasidone is also a partial agonist at the 5-HT1A receptor, with a binding affinity of 6.38 nM.[2]

The antipsychotic and antidepressant effects of lurasidone are based on these interactions.[7] Full antagonism at mesolimbic D2 receptors is useful in treating positive symptoms of schizophrenia, including delusions and hallucinations. Lurasidone also functions as an antagonist at the serotonin 5-HT2A receptor. Through this effect, it disinhibits dopamine neurons, leading to an increase in dopamine release. Dopamine competes with the antipsychotic activity at the D2 receptors, exhibiting D2 antagonistic effects. The enhanced tolerability profile of lurasidone is linked to this mechanism of action, which decreases antagonistic binding in several dopaminergic pathways.[8-11] To lessen extrapyramidal symptoms, lurasidone targets the nigrostriatal pathway. Additionally, antagonism at the 5-HT2A receptors alleviates serotonergic stimulation of cortical pyramidal cells.[9-11] Lurasidone's antagonism at the 5-HT7 receptor may enhance learning and memory while also contributing to the alleviation of cognitive impairments and depressive symptoms.[12,13] The antidepressant properties of lurasidone may also be due to partial agonism at the 5-HT1A receptor.[2]

Pharmacodynamics and Metabolism

After oral administration, lurasidone is quickly absorbed; it takes about three hours for its plasma concentration to reach its peak. Between 9% and 19% of the given dose was absorbed, according to a study done on healthy adult volunteers. Up to 100 mg per day in healthy volunteers and up to 160 mg per day in schizophrenia patients, the absorption was linear.[14] In a pharmacokinetic study, the time to peak plasma concentration in healthy volunteers ranged from an average of 2.2 to 18.3 hours for doses up to 100 mg/day, reaching 36 hours at steady state.[14]

After a single dose of 120-160 mg/day, the plasma elimination half-life in adults with schizophrenia varied from 8.8 to 37.4 hours. According to a study that looked at patients with schizophrenia or schizoaffective disorder who received multiple doses of 120 mg per day, steady-state plasma levels were reached by day five.[15] Within one to three hours after taking 40 mg orally, lurasidone reaches its peak plasma concentration. It takes seven days of continuous administration to reach steady-state levels. Lurasidone primarily binds to plasma proteins, including albumin and alpha-1 acid glycoprotein, after absorption.[14]

Cytochrome P (CYP) 450 3A4 is the primary metabolic enzyme for lurasidone; it is not a substrate for CYP1A1, 1A2, 2A6, 4A11, 2B6, 2C8, 2C9, 2C19, 2D6, or 2E1. S-oxidation, hydroxylation of the norbornane ring, and oxidative N-dealkylation are the primary metabolic processes of lurasidone. Two pharmacologically active metabolites are produced by these metabolic processes: ID-14283 (the exohydroxy metabolite), which contributes about 25% of primary exposure, and ID-14326, which makes up about 3%. A third minor active metabolite, ID-11614, constitutes approximately 1% of exposure.[14,15] Lurasidone does not induce or inhibit CYP enzymes. Furthermore, lurasidone's primary active metabolite, ID-14283, has a shorter half-life than the drug itself. About 80% of lurasidone is eliminated through feces, 9.2% through urine, and the remaining 10.7% through unknown means. Patients with hepatic and renal insufficiency need to have their doses monitored. Furthermore, lurasidone is one of the few SGAs whose absorption is significantly influenced by food intake. When administered with a meal containing approximately 350 calories, its bioavailability increases substantially, whereas fasting conditions markedly

reduce systemic exposure. This pharmacokinetic feature has important clinical implications, as patients are advised to take lurasidone with food to ensure optimal therapeutic efficacy.

Dosage and Application

Lurasidone comes in 20 mg, 40 mg, 60 mg, 80 mg, and 120 mg extended-release tablet forms. All dosages are accessible in Türkiye. 40 mg daily is the recommended starting dose for treating schizophrenia in adults and adolescents, with a daily maximum of 80 mg for adolescents and 160 mg for adults.[16] For the treatment of bipolar depression, the recommended starting dose for both adults and pediatric patients is 20 mg per day, with the dose being increased after one week if necessary. The maximum recommended dose for treatment is 120 mg per day for adults and 80 mg per day for adolescents.

For adults with moderate to severe renal impairment, treatment should be initiated at a dose of 20 mg/day, with dosage adjustments permitted up to a maximum of 80 mg/day.[16] These dosages may be cut in half for teenagers. Adults with severe hepatic impairment should take no more than 40 mg per day, with a starting dose of 20 mg. Doses for children should likewise be lowered appropriately. The recommended starting dose for moderate liver impairment is 20 mg per day, with a maximum dose of 80 mg per day; for severe liver impairment, the maximum recommended dose is 40 mg per day.[17] The primary CYP450 enzyme responsible for metabolizing lurasidone is CYP3A4. Consequently, the lurasidone dosage should be lowered to an initial 20 mg/day with a maximum of 80 mg/day, which is half the recommended dosage, when co-administered with moderate CYP3A4 inhibitors. Conversely, when administered alongside moderate CYP3A4 inducers, dosage adjustments may be required to ensure therapeutic effectiveness.

Adverse Effects

Studies on the adverse effects of lurasidone have shown that it poses fewer metabolic risks—such as hyperglycemia, hypercholesterolemia, hyperlipidemia, and weight gain—compared with quetiapine and the olanzapine/fluoxetine combination.[18] In a study evaluating the relationship between antipsychotic use and metabolic syndrome in children and adolescents, it was observed that antipsychotics generally pose a high risk of inducing lipid disorders; however, lurasidone and aripiprazole demonstrated a more neutral metabolic profile.[19]

A review examining the effects of lurasidone in adolescents identified somnolence, extrapyramidal symptoms, akathisia, and nausea as the most common side effects.[5] The majority of treatment-related side effects were mild to moderate in severity, with akathisia, nausea, and somnolence being the most frequent. This was the conclusion of a double-blind, placebo-controlled study evaluating lurasidone monotherapy for bipolar 1 depression in adult patients. Other common side effects in this study included nasopharyngitis and Parkinsonism, which were more common in the lurasidone groups than in the placebo groups.[20]

There were no clinically significant differences between the lurasidone and placebo groups in terms of changes in lipid, glucose, and prolactin levels, and the average change in QT interval was comparable, according to a study assessing the medication's safety and effectiveness in treating children and adolescents with bipolar I depression.[21] However, in studies assessing its effects in the acute phase, significant increases in prolactin levels were observed. Lurasidone was also associated with an approximate 7% increase in baseline body weight.[22] Additionally, findings indicate that lurasidone led to a 7% increase in baseline body weight.[23] It has been documented that lurasidone, especially when taken by pregnant patients in the third trimester, can cause withdrawal symptoms or extrapyramidal symptoms in newborns.[13,16]

A treatment guideline for the acute management of schizophrenia states that, in some cases, higher doses of antipsychotics may be required. While increased doses lead to greater postsynaptic dopamine receptor blockade—potentially reducing the antidepressant effect—they also heighten susceptibility to side effects. However, it has been suggested that lurasidone maintains its antidepressant properties even at higher doses, highlighting the need for individualized dose adjustments based on clinical response.[24]

Follow-up

For patients with hepatic and renal impairment, dose monitoring is crucial. Modifications are recommended for moderate to severe cases, but mild impairment does not require dosage adjustments. Additionally, using lurasidone with CYP3A4 inducers or inhibitors requires careful monitoring.

There are very few case reports linking lurasidone to anemia. Chronic and severe psychiatric disorders, including schizophrenia and bipolar disorder, can elevate the risk of anemia and nutritional deficiencies, largely due to inadequate dietary habits. Therefore, it is recommended that patients receiving lurasidone undergo blood count evaluations both at the beginning of treatment and during follow-up.[25]

Toxicity

There is little information on lurasidone overdose. Only one overdose case report has been found in a review of the current literature. In this instance, a male individual, age 31, attempted suicide by ingesting 8.5 times the recommended maximum dosage. The overdose occurred shortly after lunch, which may have enhanced lurasidone absorption. Following the high-dose intake, the patient developed mild hypertension and a slight elevation in thyroid-stimulating hormone (TSH) levels. Treatment consisted of intravenous fluids, and the patient recovered without long-term complications, with TSH levels returning to normal three weeks later.[26] Currently, no specific antidote exists for lurasidone. In the event of an overdose, patients should be closely monitored for QT interval prolongation, orthostatic hypotension, central nervous system depression, and tachycardia, with appropriate supportive care administered as needed.[27]

Efficacy and Safety

Considering the effectiveness and safety issues associated with medications used to treat schizophrenia and bipolar disorder, a cautious approach is necessary, especially when treating children and adolescents. There are currently few clinical studies on lurasidone's effectiveness in treating schizophrenia in children. Nonetheless, research on adults has demonstrated that lurasidone is superior to a placebo in terms of lowering symptoms of schizophrenia. These findings imply that children and adolescents may also experience comparable effectiveness. All things considered, lurasidone is generally well-tolerated and has a favorable metabolic side effect profile. It has also shown effectiveness in the acute and long-term management of schizophrenia.[19] The ability to adjust the dose according to clinical needs provides flexibility in the treatment process.

In a study, DelBello et al.[21] assessed the safety and effectiveness of lurasidone in treating adolescent bipolar depression. Patients with bipolar I depression who were between the ages of 10 and 17 were randomly assigned to receive either lurasidone or a placebo for six weeks, with a flexible dosage range of 20 to 80 mg per day. The main outcome measure was the change in the overall score on the Children's Depression Rating Scale-Revised (CDRS-R) between baseline and week six. The results showed that, in comparison to the placebo, lurasidone resulted in a statistically significant improvement in the CDRS-R total score at week six. Additionally, lurasidone demonstrated improvements in secondary outcome measures, including the Clinical Global Impressions-bipolar severity of depression score, anxiety levels, quality of life, and overall functioning.

A recent study was carried out to assess how children and adolescents with bipolar depression responded to lurasidone treatment, sleep disturbances, and irritability.[19] Lurasidone was given in flexible doses ranging from 20 to 80 mg/day to 347 children and adolescents with bipolar I depression in this randomized, placebo-controlled study. Young people with DSM-5 bipolar I depression, with or without rapid cycling and psychotic features, who were between the ages of 10 and 17 were included in the study. During a six-week, double-blind treatment phase, these participants were randomly assigned to receive either a placebo or flexible doses of lurasidone (20-80 mg). At both the screening and baseline evaluations, eligible participants had to have a Young Mania Rating Scale (YMRS) item 1 (elevated mood) score of less than 2 and a total score of less than 15. The Children's Global Assessment Scale (CGAS), YMRS, and the CDRS-R were used to evaluate the outcome measures in this analysis. In this study, bridge symptoms—which are common and disruptive in bipolar depression—were identified as a decrease in sleep needs and irritability. By the sixth week of lurasidone treatment, it was discovered that improvements in manic and depressive symptoms were mediated by a decrease in irritability and sleep requirements. Low CDRS-R and high CGAS scores persisted throughout the course of treatment. After two years of lurasidone treatment, a significantly higher percentage of participants without bridge symptoms—such as reduced sleep needs and irritability—achieved sustainable improvement criteria at the conclusion of the 6-week acute treatment period than those who did not. Treatment with lurasidone improved the cluster of depressive symptoms more than it did the key manic symptoms.[19]

A publication from 2024 exploring advancements in the diagnosis and treatment of pediatric bipolar disorder highlights lurasidone's potential to significantly reduce depressive symptoms while being a preferred option due to its minimal impact on weight.[28] Research has shown that lurasidone significantly improves depression scores when compared to placebo groups, effectively reducing depressive symptoms in patients with bipolar I depression.[19,21,23] With few adverse effects and little effect on weight or metabolic parameters, lurasidone has also been well tolerated.

To provide a structured overview of the current evidence, Table 1 summarizes the main clinical studies investigating lurasidone use in children and adolescents. The table presents study populations, design, key outcomes, and reported adverse events. As seen, most trials focus on schizophrenia and bipolar I depression, consistently demonstrating lurasidone's favorable efficacy and tolerability profile, particularly regarding metabolic safety. Nonetheless, the limited number of randomized controlled trials underscores the need for further research to consolidate these findings.

Comparison with Other Antipsychotics in Treatment

Only a limited number of randomized clinical trials have compared the efficacy and tolerability of atypical antipsychotics in patients younger than 18 years.[11,29] Lurasidone is significantly more effective than placebo, as measured by the Positive and Negative Syndrome Scale and Clinical Global Impressions-severity (CGI-S) scales, and to have comparable efficacy to other oral atypical antipsychotics in adolescents with schizophrenia.[11] In this study, adolescents treated with lurasidone experienced fewer withdrawal symptoms than those treated with aripiprazole and paliperidone estrogen receptor (ER), and participants showed statistically significantly less weight gain than those treated with quetiapine, olanzapine, risperidone, asenapine, or paliperidone ER. Lurasidone and other antipsychotics did not significantly differ in their risk of akathisia or extrapyramidal symptoms. Compared to the majority of atypical antipsychotics, lurasidone has a lower risk of weight gain and appears to be an effective treatment for adolescents with schizophrenia, according to these findings.[11]

The use of atypical antipsychotics in bipolar disorder was the subject of a 2021 review that searched MEDLINE, EMBASE, PsycINFO, and ClinicalTrials.gov for studies published between January 2017 and July 2020 without regard to language limitations. The mean decreases in depressive and manic symptoms, as measured by the Montgomery-Åsberg Depression Rating Scale (MADRS), Hamilton Depression Rating Scale, and YMRS, as well as the overall severity measured by the CGI-S scale, were the main outcomes in studies on acute bipolar

depression and bipolar mania. Remission rates (defined as MADRS total score ≤8, YMRS total score ≤12, or CGI-S ≤2), response rates (defined as ≥50% reduction from baseline in total YMRS or MADRS score), treatment discontinuation rates, treatment discontinuation due to side effects, and the incidence of any adverse events were examples of secondary outcomes. In the maintenance treatment of bipolar disorder, lurasidone is assumed to be more successful in preventing depressive episodes than manic episodes. Similar weight changes were noted between the lurasidone and placebo treatment groups, and nausea and sedation were the most frequently reported side effects. According to analyses, patients receiving lurasidone had a noticeably lower recurrence rate of depressive episodes. Lurasidone monotherapy, at a dose of 20-80 mg daily, has been demonstrated to be a successful and well-tolerated treatment for acute depression in patients with bipolar disorder who are not responding to treatment.[30]

In 2023, a thorough systematic review and meta-analysis of randomized controlled trials involving antipsychotic drugs for individuals with unipolar and bipolar depression aged 10 to 25 was carried out. The four randomized controlled trials selected for inclusion focused on adolescents diagnosed with bipolar depression. All studies compared antipsychotic drug treatment with placebo and used the CDRS-R to measure depressive symptoms. In the study that included lurasidone, it was found to be effective and well-tolerated with good safety in bipolar depression.[31] Lurasidone seemed neutral for all glucose and lipid-related outcomes in adults with bipolar depression, and its use in adolescents was thought to be more beneficial, according to the first umbrella review, which was published in 2023 and methodically and quantitatively documented the effects of pharmacological and non-pharmacological interventions on physical health outcomes in mood disorder patients.[32]

Expert Opinion

Lurasidone has proven to be effective in both lowering the chance of relapse and treating schizophrenia acutely. Numerous symptoms of schizophrenia, including positive, negative, and cognitive symptoms, have been demonstrated to improve with it. As a result, it might be a suitable choice for treating schizophrenia patients in a customized manner.[33] Lurasidone also has a good tolerability profile, with little effect on prolactin levels, weight gain, or metabolic parameters. Patients with bipolar I depression have shown significant reductions in depressive symptoms when taking lurasidone at doses ranging from 20 to 120 mg/day.[31] Given this data and the increasing number of adolescent studies, it is considered an antipsychotic that can be safely used in the adolescent population.

Limitations and Future Directions

Despite the growing clinical interest in lurasidone for children and adolescents, the current body of evidence remains limited. Most available data are derived from a small number of randomized controlled trials with relatively short follow-up periods, which restricts the ability to draw firm conclusions about long-term efficacy and safety. Furthermore, existing studies often include heterogeneous samples, and there is a lack of head-to-head comparisons with other SGAs commonly used in pediatric psychiatry. Another limitation is the underrepresentation of certain diagnostic categories, such as schizoaffective disorder and comorbid conditions, which are frequently encountered in real-world clinical settings.

Future research should therefore prioritize large-scale, multicenter randomized controlled trials with extended follow-up to better characterize the efficacy, safety, and tolerability of lurasidone in diverse pediatric populations. Comparative effectiveness studies against other antipsychotics are also warranted to guide evidence-based prescribing practices. In addition, studies focusing on long-term metabolic outcomes, cognitive functioning, and quality of life will be crucial to fully assess the clinical utility of lurasidone. Finally, real-world evidence and naturalistic studies may complement controlled trials by capturing treatment effectiveness and tolerability in everyday clinical practice.

Key Information

Lurasidone is approved by the FDA to treat bipolar disorder (ages 10-17) and schizophrenia (ages 13-17) in adults and adolescents (ages 13-17), as well as by the EMA. Lurasidone comes in 20 mg, 40 mg, 60 mg, 80 mg, and 120 mg tablet forms. It is quickly absorbed, and CYP3A4 metabolizes it. Lurasidone has little effect on body weight, prolactin levels, or metabolic parameters and is well tolerated.

Conclusion

In the treatment of bipolar depression and schizophrenia, lurasidone has proven to be effective, reliable, and tolerable. Its side effect profile is also generally better than that of other antipsychotic medications. Its pharmacokinetic advantages include rapid absorption following oral administration, a short time to achieve steady-state concentration, and a lack of significant interactions with enzyme systems (e.g., minimal inhibition or induction of CYP450 enzymes). Additionally, lurasidone has demonstrated potential as a monotherapy option for bipolar disorder that is resistant to treatment. It has the dual advantage of preventing the need for high-dose antipsychotic regimens and offering antidepressant effects at higher doses for the acute treatment of schizophrenia.

Despite these advantages, there remains a need for further clinical research to evaluate the efficacy and safety of lurasidone in pediatric and adolescent populations. Future studies should focus on elucidating both the short- and long-term outcomes of lurasidone treatment in these younger age groups. Additionally, research should explore its effectiveness across diverse diagnostic categories and varying levels of symptom severity. Importantly, the treatment of children and adolescents with lurasidone should not be confined to pharmacological interventions alone. A holistic, multidisciplinary approach that integrates psychosocial and

Table 1. Summary of clinical studies of lurasidone in children and adolescents

First author (year)	Population (age, n)	Design	Disorder/ indication	Key findings	Adverse effects
DelBello et al. (2017)[21]	Adolescents 10-17 yrs, n=347	RCT, double-blind, placebo-controlled, 6 weeks, flexible dose 20-80 mg/day	Bipolar I depression	Significant reduction in CDRS-R scores vs placebo; improvement in CGI-BP, anxiety, and quality of life	Somnolence, nausea, akathisia, extrapyramidal symptoms (mostly mild/ moderate)
Loebel et al. (2014)[23]	Adolescents 13-17 yrs (part of sample included adults), n≈326	RCT, double-blind, placebo-controlled	Schizophrenia	Lurasidone significantly reduced PANSS and CGI-S scores; efficacy comparable to other SGAs	Akathisia, somnolence, nausea; lower risk of weight gain vs quetiapine/ olanzapine
Kato et al. (2020)[20]	Adolescents & adults (subgroup 10-17 yrs analyzed separately), n≈463	RCT, double-blind, placebo-controlled, 6 weeks	Bipolar I depression	Significant improvement in depressive symptoms on CDRS-R; consistent efficacy across pediatric subgroups	Nausea, akathisia, somnolence; metabolic parameters largely unchanged
Singh et al. (2023)[19]	Adolescents 10-17 yrs, n=347 (secondary analysis of DelBello et al.[21] 2017 trial)	Post-hoc analysis	Bipolar I depression	Improvement in sleep disturbance and irritability mediated antidepressant response; better functional outcomes.	Similar safety profile: akathisia, somnolence, nausea
Arango et al. (2020)[30]	Adolescents with schizophrenia, 13-17 yrs, n varies across pooled trials	Systematic review & network meta-analysis	Schizophrenia	Lurasidone showed efficacy comparable to risperidone, aripiprazole, and paliperidone; better weight/metabolic profile.	Lower risk of weight gain, neutral metabolic profile
Fiorillo et al. (2022)[5]	Adolescents & adults with schizophrenia, real-world data	Narrative review + real-world observations	Schizophrenia	Confirmed efficacy in symptom reduction; good tolerability in clinical practice	Mild EPS, low weight gain risk
Garcia-Rodriguez et al. (2023)[31]	Adolescents/young adults 10-25 yrs, meta-analysis of RCTs	Systematic review & meta-analysis	Unipolar & bipolar depression	Lurasidone effective and well-tolerated in pediatric bipolar depression	Neutral metabolic profile, low discontinuation rates
Carnovale et al. (2024)[34]	Children/adolescents with psychosis or bipolar disorders	Umbrella review	Metabolic safety	Lurasidone among SGAs with the lowest metabolic risk in youth	Minimal impact on weight, lipids, and glucose

CGI-BP: Clinical Global Impressions-bipolar, PANSS: Positive and Negative Syndrome Scale, RCT: Randomized controlled trial, CDRS-R: Children's Depression Rating Scale-Revised, CGI-S: Clinical Global Impressions-severity, SGA: Second-generation antipsychotic

behavioral strategies may optimize therapeutic outcomes in this vulnerable population. The development of comprehensive clinical guidelines and tailored treatment protocols could further enhance the success of lurasidone-based therapies in pediatric psychiatric care.

Footnotes

Authorship Contributions

Concept: B.S.Ö., C.Ö., B.Ş., C.Ç.O., Design: B.S.Ö., C.Ö., B.Ş., C.Ç.O., Data Collection or Processing: B.S.Ö., C.Ö., B.Ş., C.Ç.O., Analysis or Interpretation: B.S.Ö., C.Ö., B.Ş., C.Ç.O., Literature Search: B.S.Ö., C.Ö., B.Ş., C.Ç.O., Writing: B.S.Ö., C.Ö., B.Ş., C.Ç.O.

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Helikopter Ebeveynlik ile Anne-Çocuk İlişkisi Arasındaki İlişkide Anne Bekçiliği ve Ebeveyn Tükenmişliğinin Aracı Rolü

The Mediating Role of Maternal Gatekeeping and Parental Burnout in the Relationship Between Helicopter Parenting and Mother-Child Relationship

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ÖZ

Amaç: Günümüzde özellikle annelerin çocuklarına yönelik helikopter ebeveynlik davranışlarının arttığı ve alanyazındaki çelişkili bulgulara rağmen modern çağa özgü bu ebeveynliğin; ebeveynler, çocuklar ve ebeveyn-çocuk ilişkisi üzerinde olumsuz etkileri olabildiği dikkat çekmektedir. Bu bağlamda, helikopter ebeveynlik davranışlarıyla ilişkili bireysel ve ailesel faktörleri incelemenin önemli olduğu düşünülmektedir. Dolayısıyla bu çalışmada helikopter ebeveynlik ile olumsuz anne-çocuk ilişkisi arasındaki ilişkide annenin olumsuz bekçiliği ve ebeveyn tükenmişliğinin aracı rolünü değerlendirmek için öne sürülen modelin test edilmesi amaçlanmıştır.

Gereç ve Yöntem: Mevcut araştırma Türkiye'nin farklı şehirlerinde yaşayan, evli ve ilköğretim birinci kademede en az bir çocuğa sahip olan 270 anne ($yaş_{ort}$=37,09; standart sapma=4,93 yıl) ile gerçekleştirilmiştir. Araştırmada veriler, annelerden "Helikopter Anababalık Ölçeği", "Anne Bekçiliği Ölçeği", "Ebeveyn Tükenmişliği Değerlendirme Bataryası" ve "Ebeveyn-Çocuk İlişkisi Ölçeği" kullanılarak çevrimiçi olarak toplanmıştır.

Bulgular: Yapısal eşitlik modeli analizinin sonuçları, modelin veriye iyi uyum sağladığını ortaya koymuştur. Elde edilen bulgular, öngörülen modelin anne bekçiliği ve ebeveyn tükenmişliği aracılığıyla gerçekleştiğine işaret etmiştir. Helikopter ebeveynliğin hem anne bekçiliği aracılığıyla hem de doğrudan olumsuz anne-çocuk ilişkisini yordadığı saptanmıştır. Helikopter ebeveynliğin anne bekçiliğinden ebeveyn tükenmişliğine giden yol aracılığıyla da sıralı olarak olumsuz anne-çocuk ilişkisini yordadığı bulunmuştur. Ayrıca anne bekçiliğinin hem ebeveyn tükenmişliği aracılığıyla hem de doğrudan olumsuz anne-çocuk ilişkisini yordadığı da görülmüştür. Modelde ebeveyn tükenmişliğinin ise doğrudan olumsuz anne-çocuk ilişkisini yordadığı sonucuna ulaşılmıştır.

Sonuç: Bulgular, ebeveynlik alanyazını bağlamında tartışılmış olup, ulaşılan sonuçların anne-çocuk ilişkisini desteklemeye yönelik geliştirilebilecek önleme ve müdahale programlarına rehberlik etmesi beklenmektedir.

Anahtar Kelimeler: Helikopter ebeveynlik, anne bekçiliği, ebeveyn tükenmişliği, anne-çocuk ilişkisi

ABSTRACT

Objectives: In today's world, particularly mothers' helicopter parenting behaviors toward their children have been on the rise. Despite contradictory findings in the literature, this modern parenting style was noted to have potentially adverse effects on parents, children, and parent-child relationships. In this context, examining the individual and familial factors associated with helicopter parenting was considered essential. This study sought to examine a proposed model investigating the mediating effects of maternal gatekeeping and parental burnout on the association between helicopter parenting and negative mother-child relationships.

Materials and Methods: The research was conducted with 270 married mothers (age_{mean}=37.09; standard deviation=4.93 year) who have at least one child in primary school and reside in various cities in Türkiye. Data were collected online through the following instruments: the "Helicopter Parenting Scale," "Maternal Gatekeeping Scale," "Parental Burnout Assessment," and "Parent-Child Relationship Scale."

Results: The results of the structural equation modeling analysis indicated that the model demonstrated a good fit to the data. The findings suggested that the proposed model was supported, showing that helicopter parenting predicted negative mother-child relationships both directly and indirectly via maternal gatekeeping. Moreover, helicopter parenting also predicted negative mother-child relationships sequentially through maternal gatekeeping and parental burnout. Additionally, maternal gatekeeping predicted negative mother-child relationships both directly and indirectly via parental burnout. Parental burnout was found to have a direct predictive effect on negative mother-child relationships. Parental burnout was found to have a direct predictive effect on negative mother-child relationships.

Conclusion: The findings were examined in the context of parenting research and are anticipated to inform the design of prevention and intervention programs focused on enhancing mother-child relationships.

Keywords: Helicopter parenting, maternal gatekeeping, parental burnout, mother-child relationship

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Giriş

Ailelerin çocuk yetiştirme yaklaşımları, yaşadıkları dönemin koşulları ve sosyoekonomik durumlarına göre şekillenmektedir.[1] Günümüzde tıbbi ve teknolojik imkanlar çocukların güvenliğini artırmış olsa da, bugünün çocukları birçok risk karşısında daha savunmasız görülmektedir.[2] Özellikle 1980'li yıllardan itibaren eğitim sisteminde artan rekabetin, ebeveynlerin çocuklarının akademik başarısına yönelik kaygılarını yükselttiği ifade edilmektedir.[3,4] Bu durum, ebeveynler arasında daha kaygılı bir ebeveynlik anlayışını yaygınlaştırmış[5] ve çocuklarına yönelik aşırı müdahaleci davranışları teşvik etmiş gibi görünmektedir.[6] Sonuç olarak, toplumsal güvenlik endişeleri ve geleceğe dair kaygıların, ebeveynlerin çocuklarının akademik faaliyetlerini, çevrimiçi ve çevrimdışı etkinliklerini ve sosyal ilişkilerini daha yakından takip etmelerine neden olduğu belirtilmektedir.[7] Alanyazında anne ve babaların daha kaygılı ve aşırı katılımı ile müdahalesini içeren modern çağa özgü bu ebeveynlik biçimi "helikopter ebeveynlik" olarak tanımlanmaktadır.

Helikopter ebeveynlik, anne babaların çocuklarının mutluluğu ve akademik başarısı için aşırı müdahaleci olmaları ve bu süreçte çocukların özerkliğini kısıtlamaları olarak tanımlanmaktadır.[8] "Helikopter" terimi, ilk kez Ginott'un[9] *Between Parents and Teenager* (Ebeveynler ve Gençler) kitabında, bir öğrencinin annesinin sürekli etrafında dönerek her hareketini izlemesini tanımlamak için kullanılmıştır. Helikopter ebeveynlik terimi ise Cline ve Fay'in[10] anne babaların çocuklarının her adımlarını izlediği durumu tanımlamasıyla daha yaygın hale gelmiştir. Alanyazında helikopter ebeveynler, çocuklarının hayatına fazlasıyla müdahale eden, risk almalarını engelleyen, yaşamlarını yönlendiren, aşırı endişe duyan ve gereğinden fazla fedakarlık yapan ebeveynler olarak tanımlanmaktadır.[8-11] Bu tür ebeveynlikte temel hedef, çocukları korumak, onların başarılarına katkı sağlamak ve duygusal güvenlik sunmaktır. Helikopter ebeveynliğin daha çok orta gelirli ailelerde yaygın olduğu belirtilmekle birlikte,[12] farklı sosyoekonomik düzeylerden ve kültürel arka planlardan gelen ebeveynlerde de görülebilmektedir.[13] Bu ebeveynlik yaklaşımı, hem anneler hem de babalar için geçerli olmakla birlikte[14] çocukların her gelişim düzeyinde görülmesi de muhtemeldir. Okul öncesi dönemde, ebeveynlerin çocuklarını sürekli takip ederek onların davranışlarını yönlendirdiği gözlemlenirken, okul çağında çocuğa en iyi okul ve öğretmeni bulmaya çalışmak, ödevlerine aşırı derecede yardım etmek ve boş zaman etkinliklerini fazlasıyla kontrol etmek gibi davranışlar şeklinde görülmektedir.[15]

Helikopter ebeveynlik, son yıllarda görgül çalışmalarla ele alınmaya başlanmış olup, ebeveynler, aile işlevselliği ve çocuklar üzerindeki etkileriyle dikkat çekmektedir. Helikopter ebeveynliğin "iyi niyet"li doğası ve ebeveynin çocuğa yakınlığı, çocuk tarafından bazen olumlu algılanabilirken, müdahaleci doğası ise genellikle olumsuz algılanmaktadır. Özellikle Batı kültüründe yapılan çalışmalar, bu aşırı müdahaleci yaklaşımın çocuklar üzerindeki etkilerinin büyük ölçüde olumsuz olduğuna işaret etmektedir.[16] Görgül bulgular, helikopter ebeveynliğin çocuklarda, özellikle ergenler ve genç yetişkinlerde yüksek stres ve kaygıya yol açarak psikolojik iyi oluşu olumsuz etkilediğini göstermektedir.[17,18] Ayrıca ebeveynlerin çocukları için çabaladığı bu "mükemmel yaşam", çocukların kendi başlarına problem çözme, karar verme ve özyeterlilik gibi becerileri kazanmalarını da engelleyebilmektedir.[19,20] Sonuç olarak, iyi niyetle yapılan bu ebeveynlik tarzı, çocukların özerklik ve yeterlilik kazanmasını engelleyebilir; ayrıca çocukların kendilerini baskı altında hissetmesine ve ebeveyn-çocuk ilişkilerinin kalitesinin bozulmasına neden olabilir. Nitekim Segrin ve ark.[11] çalışması, helikopter ebeveynliğin anne babalar ve çocukları açısından olumsuz ebeveyn-çocuk ilişkisi ile bağıntılı olduğunu ortaya koymuştur.

Helikopter ebeveynliğin ebeveynler üzerindeki etkilerini inceleyen çalışmalar sınırlı olsa da mevcut bulgular, bu tür bir ebeveynlik tarzının, ebeveynlerin stresini artırabildiği ve yaşamdan daha az doyum almalarına yol açabildiğini göstermektedir.[21,22] Ebeveynlikle ilişkili stres faktörlerine uzun süre maruz kalmanın ve bu stresle başa çıkmak için kaynaklarının tükenmesine bağlı olarak "ebeveyn tükenmişliği" ortaya çıkabilmektedir.[23] Alanyazında 2000'li yıllardan itibaren ebeveyn tükenmişliği üzerine yapılan araştırmaların artışı da modern ebeveynliğin getirdiği yükü dolaylı olarak ortaya koymaktadır.[24] Dolayısıyla çocuklarını korumak ve yetiştirmek için sürekli çaba harcayan ebeveynler, ulaşılması zor standartlar nedeniyle tükenmişlik yaşayabilir.[22-25] Ayrıca helikopter ebeveynlerin aşırı müdahale ve kontrol çabası, ebeveynin kendi bireysel ihtiyaçlarını göz ardı etmesine ve özerklik duygusunun azalmasına neden olarak da tükenmişliği tetikleyebilmektedir.[14] Dahası, helikopter ebeveynliğin hem ebeveynin hem de çocuğun refahını etkileyerek aşırı kontrol ve katılım ihtiyacını güçlendiren bir döngü yaratabileceği belirtilmektedir.[26] Nitekim, tükenmiş ebeveynlerin çocuklarıyla olan ilişkilerinde daha az yer aldığını, ebeveynlik rolünde duygusal kopmalar yaşadığını ve ebeveynlikten algıladıkları doyumun azaldığını gösteren çalışma sonuçları mevcuttur.[27,28]

Helikopter ebeveynlik ile ilgili çalışmalar her ne kadar ağırlıklı olarak Batı kültüründe yapılmaya başlanmış olsa da Türkiye'nin özerk-ilişkisel benlik ile ilişkilendirilen bir kültür olması[29] ülkemiz kültürü içinde helikopter ebeveynliğin norm haline gelmesine yol açmış olabilir.[30] Ülkemizde helikopter ebeveynliğin norm haline gelen kısımları ve belirtilen olumsuz etkileri göz önüne alındığında, helikopter ebeveynlik ile ilişkili değişkenlerin belirlenmesi elzemdir. Bunlardan birinin de "annenin baba üzerinde kontrollü, kolaylaştırıcı ya da sınırlayıcı yöntemler kullanarak, babanın çocuk bakımı ve çocukla ilişkisini düzenli, uygun ve tutarlı duruma getirme davranışları" olarak tanımlanan anne bekçiliği olabileceği düşünülmektedir.[31] Çünkü helikopter davranışların ebeveynler ve çocuk arasındaki sınırların belirsiz olduğu bir iç içe geçmiş aile iklimi yaratmasından[32] dolayı annenin babanın ebeveynliğine yönelik davranışlarının da kendi helikopter ebeveynliği ile ilişkili olması muhtemeldir. Ayrıca annelerin ebeveynliği, çoğu araştırmacının da belirttiği üzere, niteliksel ve niceliksel olarak babaların ebeveynliğinden farklılaşmaktadır.[33] Bu nedenle, çocukların bakımı ve eğitimiyle ilgili kararları tek başlarına alma eğiliminde olan ve çocuğu kendi istediği şekilde kontrol altında

tutmak isteyen anneler için, babaların ebeveynliği bir tehdit oluşturabilir. Dolayısıyla anneler, eşlerinin ebeveynlik rollerine katılımlarını sınırlayacak şekilde engelleyici ve kontrol edici bekçilik davranışlarında bulunabilirler.

Mevcut Araştırma

Helikopter ebeveynliğin ebeveynlerin psikolojik durumuna nasıl etki ettiğini ve bu sürecin ebeveyn-çocuk etkileşimi üzerindeki yansımalarını incelemenin, olgunun daha iyi anlaşılmasına katkı sağlayacağı düşünülmektedir. Ancak alanyazında helikopter ebeveynlik, anne bekçiliği, ebeveyn tükenmişliği ve ebeveyn-çocuk ilişkisi değişkenlerini bir arada inceleyen bir çalışmaya rastlanmamıştır. Dolayısıyla bu araştırmanın amacı, helikopter ebeveynlik ile olumsuz anne-çocuk ilişkisi arasındaki ilişkide anne bekçiliği (engel ve kontrol) ve ebeveyn tükenmişliğinin sıralı aracı rolünü değerlendirmek için hipotez edilen modelin test edilmesidir. Önerilen model, farklı alt sistemlerin bir araya gelerek bütünce hizmet ettiğini ve sürekli bir değişim içerisinde olduğunu öne süren aile sistemleri kuramı[34,35] ve alanyazındaki kısıtlı bulgular temel alınarak oluşturulmuştur. Bu bağlamda ve yukarıda aktarılan alanyazın ışığında, helikopter ebeveynlik davranışlarının hem olumsuz bekçilik davranışlarına hem de annelerin ebeveynlik rollerinde tükenmişliğine yol açabileceği ve böylelikle anne-çocuk ilişkisine zarar verebileceği öngörülmektedir. Ayrıca annelerin olumsuz bekçiliğinin, helikopter ebeveynlikte olduğu gibi tükenmişlik yaşamalarına neden olarak ailenin iç işleyişinde dengeyi bozabileceği ve ebeveyn-çocuk ilişkisinin sağlıklı gelişimini engelleyebileceği düşünülmektedir. Sonuç olarak mevcut araştırmada, annenin helikopter ebeveynliği ile olumsuz anne-çocuk ilişkisi arasındaki ilişkide anne bekçiliği (engel ve kontrol) ve ebeveyn tükenmişliğinin sıralı aracılık etkilerinin yapısal eşitlik modeli (YEM) kullanılarak değerlendirilmesi hedeflenmiştir (Şekil 1).

Gereç ve Yöntem

Araştırmada, Karasar'ın[36] tanımladığı ilişkisel tarama yöntemi uygulanmıştır. Bunun yanı sıra, çalışma nicel ve kesitsel bir desene sahiptir.

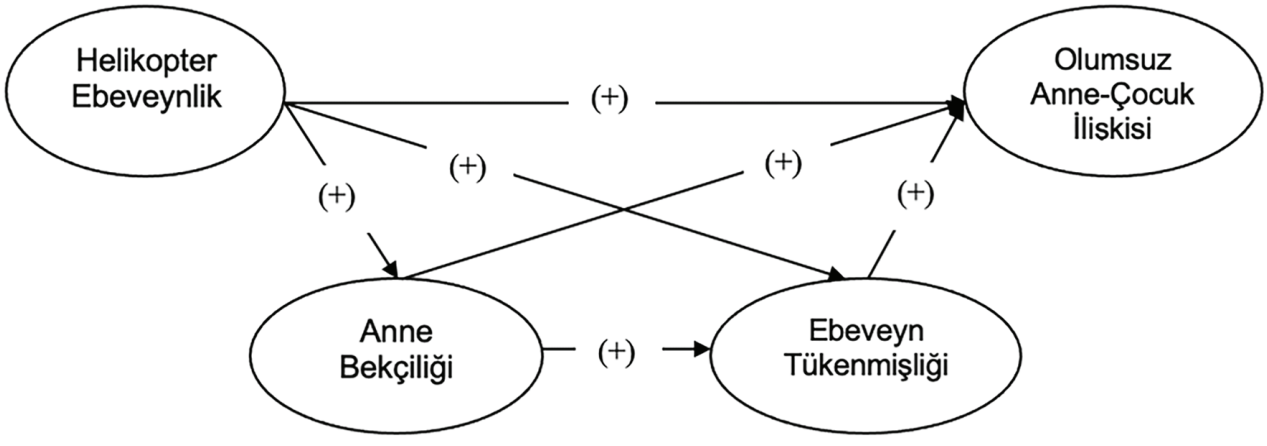
Örneklem

Bu araştırmanın hedef popülasyonu, ilköğretim birinci kademede (6-10 yaş) çocuğu bulunan annelerden oluşmaktadır. Minimum örneklem büyüklüğü, Barrett'ın[37] YEM'ler için önerdiği n>200 kriterine göre belirlenmiştir. Katılımcılar, kolay ulaşılabilir örnekleme yöntemi kullanılarak çevrimiçi platformlar üzerinden araştırmaya dahil edilmiştir. Araştırmaya katılım için annelerin evli olmaları, çocukları ve eşleriyle birlikte yaşamaları, hem kendilerinin hem de eşlerinin çocuklarının biyolojik ebeveyni olmaları gerekmektedir. Boşanmış ya da tek ebeveyn olanlar, fiziksel ya da psikiyatrik rahatsızlığı bulunanlar ve engelli çocuğu olan anneler ise araştırmaya dahil edilmemiştir. Dahil edilme kriterlerine uygun olmayan katılımcılar çıkarıldıktan sonra (bkz. istatistiksel analiz), örneklem son haliyle oluşturulmuştur. Nihai örneklem Türkiye'nin farklı şehirlerinde yaşayan, evli ve ilköğretim birinci kademede en az bir çocuğa sahip olan 270 anneden oluşmaktadır. Annelerin yaşları 25-52 arasında değişmekte olup yaş ortalamaları 37,09 yıldır [standart sapma (SS)=4,93]. Evlilik süreleri de 7 ile 30 yıl arasında (ort=12,66; SS=4,67) değişmektedir. Annelerin büyük çoğunluğu (n=176) üniversite ve üstü bir eğitim düzeyine sahip olup, %60'ı (n=162) ücretli bir işte çalışmaktadır. Ayrıca annelerin %59,3'ü (n=160) kendilerini Türkiye şartlarında orta sosyoekonomik düzeyde gördüklerini rapor etmiştir. Katılımcı annelerin sahip olduğu çocuk sayısı 1 ila 6 arasında değişirken çocuklarının %47,4'ü (n=128) kız, %52,6'sı (n=142) erkektir ve çocukların yaş ortalaması 7,68'dir (SS=1,39). Annelerle ilgili betimleyici istatistikler Tablo 1'de sunulmuştur.

Veri Toplama Araçları

Kişisel Bilgi Formu: Annelerin kendilerine ve ailelerine yönelik demografik bilgilerini elde etmek amacıyla bu çalışma kapsamında hazırlanmıştır.

Helikopter Anababalık Ölçeği: Daşcı[30] tarafından ebeveynlerin helikopter ebeveynlik davranışlarını değerlendirmek amacıyla geliştirilen ölçek, toplam 24 maddeden oluşmaktadır. Ölçek, "aşırı duyarlık ve kaygı" ile "özerklik sınırlandırma" olmak üzere iki alt boyuta sahiptir. Ölçekten elde edilen yüksek



Şekil 1. Hipotez edilen model

puanlar katılımcıların yüksek düzeyde helikopter ebeveynlik sergilediğine karşılık gelmektedir. Ölçeğin ebeveyn formunun güvenirlik katsayıları alt boyutlar için sırasıyla 0,86; 0,78 ve tüm ölçek için 0,88 olarak rapor edilmiştir.[30] Bu çalışmada, ölçeğin ebeveyn formu annelerin kendi helikopter ebeveynlik davranışlarını değerlendirmek için kullanılmıştır. Cronbach alfa katsayıları, alt boyutlar için sırasıyla 0,92 ve 0,83 ve ölçeğin tümü için 0,94 olarak hesaplanmıştır.

Anne Bekçiliği Ölçeği: Puhlman ve Pasley[38] tarafından yılında geliştirilen ölçek, Akgöz-Aktaş ve Aydın[39] tarafından Türkçeye uyarlanmıştır. Uyarlaması yapılan ölçek ülkemizde 29 madde ve aynı 3 boyut ile doğrulanmıştır. Ölçek, annelerin babaların (eşlerinin) çocuk bakımına yönelik davranışlarını üç boyutta değerlendirmeyi amaçlamaktadır: teşvik, kontrol ve engel. Ölçekteki her alt boyuttan elde edilen puanlar arttıkça, annelerin o boyuttaki bekçilik davranışları artmaktadır. Cronbach alfa değerleri teşvik için 0,81, kontrol için 0,74 ve engel için 0,66 olarak saptanmıştır.[39] Mevcut çalışmada annelerin olumsuz bekçilik davranışlarını değerlendirmek amacıyla ölçeğin engel ve kontrol boyutları kullanılmış olup, Cronbach alfa katsayıları sırasıyla 0,82 ve 0,85 olarak hesaplanmıştır.

Tablo 1. Annelere ilişkin betimleyici istatistikler

Değişken	n (%)
Yaş	
Ortalama (ss); ranj	37,09 (4,93); 25-52
Eğitim durumu	
İlkokul ve ortaokul	31 (%11,5)
Lise ve yüksekokul	63 (%23,3)
Üniversite ve lisansüstü	176 (%65,2)
Çalışma durumu	
Çalışıyor	162 (%60)
Çalışmıyor	108 (%40)
Algılanan SED	
Ortanın altı	36 (%13,3)
Orta	160 (%59,3)
Ortanın üstü	74 (%27,4)
Evlilik süresi	
Ortalama (ss); ranj	12,66 (4,67); 7-30
Çocuk sayısı	
1	89 (%33,0)
2	125 (%46,3)
3	39 (%14,4)
4	15 (%5,6)
5	1 (%0,4)
6	1 (%0,4)
Çocuk yaş	
Ortalama (ss); ranj	7,68 (1,39); 6-10
Çocuk cinsiyet	
Kız	128 (%47,4)
Erkek	142 (%52,6)

ss: Standart sapma, n: Kişi sayısı, SED: Sosyoekonomik düzey, Ranj: En düşük ve en yüksek değer arasındaki fark

Ebeveyn Tükenmişliği Değerlendirme Bataryası: Ebeveynlerin tükenmişlik düzeyini saptamak amacıyla Hubert ve Aujoulat[25] tarafından geliştirilen ölçek 23 maddedir. Ölçek, Arikan ve ark.[40] tarafından dilimize uyarlanmış olup dört alt boyuttan oluşmaktadır: duygusal tükenmişlik, önceki ebeveyn benliğiyle karşıtlık, bıkmışlık hissi ve duygusal uzaklaşma. Ölçekten alınan yüksek puanlar, bireylerin ebeveyn olarak tükenmişlik düzeylerinin yüksek olduğunu göstermektedir. Annelerle yapılan ölçümlerde alt boyutlar ve toplam ölçek için Cronbach alfa değerleri sırasıyla 0,84; 0,80; 0,55; 0,51 ve 0,91 olarak belirlenmiştir.[40] Bu araştırmada ölçek, annelerin ebeveyn olarak tükenmişlik düzeylerini değerlendirmek amacıyla kullanılmış olup, Cronbach alfa katsayıları sırasıyla 0,91; 0,87; 0,82; 0,69 ve ölçeğin tümü için 0,95 olarak hesaplanmıştır.

Ebeveyn-Çocuk İlişkisi Ölçeği: Ebeveyn ile çocuk ilişkisinin niteliğini değerlendirme amacıyla Hetherington ve ark.[41] tarafından geliştirilen ölçek, Aytaç ve ark.[42] tarafından uyarlanmıştır. Toplam 15 maddeden oluşan ölçek, "olumlu ebeveyn-çocuk ilişkisi" ve "olumsuz ebeveyn-çocuk ilişkisi" olmak üzere iki alt boyuta sahiptir. Alt boyutlardan elde edilen yüksek puanlar, ilgili boyuttaki olumlu ya da olumsuz ilişkinin daha güçlü olduğunu işaret etmektedir. Uyarlama çalışmasında ölçeğin güvenilirlik katsayıları sırasıyla 0,81 ve 0,80 olarak belirlenmiştir.[42] Bu çalışmada annelerin çocuklarıyla olan ilişkisini değerlendirmek amacıyla ölçeğin olumsuz ilişki alt boyutu kullanılmış olup, ilgili Cronbach alfa katsayısı 0,80 olarak hesaplanmıştır.

İşlem

Bu araştırma, Samsun Üniversitesi Etik Kurulu'ndan alınan izinle (karar no: 2024-73, tarih: 19.09.2024) yürütülmüştür. Çalışmada kullanılması planlanan ölçekler, Google Formlar üzerinden çevrimiçi olarak hazırlanmış ve ölçek bağlantısı, annelere sosyal medya platformları (Facebook, Instagram, vb.) aracılığıyla duyurularak ulaştırılmıştır. Ölçek sorularına geçmeden önce çevrimiçi bağlantıda katılımcılara bilgilendirilmiş onam formu sunulmuştur. Veriler, yaklaşık yarım saat süren çevrimiçi anket yoluyla Ekim-Kasım 2024 tarihleri arasında toplanmıştır.

İstatistiksel Analiz

Analizlere başlamadan önce, araştırmanın dahil edilme ve dışlanma kriterlerine uygunluk açısından veri temizliği yapılmıştır. Bu süreçte, ulaşılan 310 anneden 33'ünün verisi çıkarılmıştır. Kalan 277 katılımcıya ilişkin uç değerler incelenmiş olup, Z puan aralıklarına uymadığı[43] belirlenen 7 uç değer de veri setinden çıkarılmıştır. Daha sonra, nihai örneklem (n=270) için değişkenlerin basıklık ve çarpıklık değerleri incelenerek verilerin normal dağılıma uygunluğu değerlendirilmiştir. Normal dağılım gösterdiği tespit edilen veriler üzerinde analizler SPSS 22.00 (IBM Inc., Armonk, NY) ve LISREL 8.8 (Scientific Software.

Mooresville, IND) programları ile gerçekleştirilmiştir. Analizler kapsamında, ilk olarak değişkenler arasındaki ilişkiler korelasyon analizi ile incelenmiştir. Ardından, helikopter ebeveynlik ile olumsuz anne-çocuk ilişkisi arasındaki ilişkide anne bekçiliği ve ebeveyn tükenmişliğinin aracı rolünü değerlendirmek için YEM uygulanmıştır. YEM'ye yönelik analizler için kullanılan uyum ve hata istatistikleri ise şu şekildedir: χ^2/df<3, uygunluk indeksi (GFI), karşılaştırmalı uygunluk indeksi (CFI), düzeltilmiş uygunluk indeksi (NFI), düzeltilmemiş uygunluk indeksi (NNFI) veya artımsal uygunluk indeksi (IFI) ≥0,95 ve yaklaşık hata ortalaması (RMSEA) veya standartlaştırılmış karekök artık (SRMR) <0,08.[44,45] Son olarak, model karşılaştırması için ki-kare fark testinden faydalanılmıştır.[45]

Bulgular

Değişkenler Arasındaki İlişkiler

Test edilmesi planlanan modelde yer alan gösterge değişkenler arasındaki ilişkiler, Pearson momentler çarpımı korelasyonu analiziyle incelenmiştir. Araştırma değişkenleri arasındaki korelasyon sonuçları Tablo 2'de yer almaktadır.

Değişkenler arasındaki ilişkiler incelendiğinde; helikopter ebeveynliğin engelleyici bekçilik (r=0,20; p<0,01), kontrol edici bekçilik (r=0,27; p<0,001), ebeveyn tükenmişliği (r=0,18; p<0,01) ve olumsuz anne-çocuk ilişkisi (r=0,27; p<0,001) ile olumlu yönde anlamlı ilişkileri olduğu saptanmıştır. Ayrıca annelerin engelleyici bekçiliğinin ebeveyn tükenmişliği (r=0,35; p<0,001) ve olumsuz anne-çocuk ilişkisi (r=0,42; p<0,001) ile ilişkisinin olumlu yönde olduğu görülmüştür. Annelerin kontrol edici bekçiliğinin de ebeveyn tükenmişliği (r=0,26; p<0,001) ve olumsuz anne-çocuk ilişkisi (r=0,31; p<0,001) ile ilişkisinin olumlu yönde olduğu sonucuna ulaşılmıştır. Son olarak, ebeveyn tükenmişliği ile olumsuz anne-çocuk ilişkisi değişkeni arasında olumlu yönde istatistiksel olarak anlamlı ilişki olduğu bulunmuştur (r=0,30; p<0,001).

Yapısal Eşitlik Modeli

Araştırmada test edilmesi planlanan model Şekil 1'de sunulmuş idi. YEM analizine başlanmadan önce, ilk olarak ölçüm modeli sınanmıştır. Bu modelde 4 gizil değişken ve 12 gösterge kullanılmıştır. Gizil değişkenler; helikopter ebeveynlik, anne bekçiliği, ebeveyn tükenmişliği ve olumsuz anne-çocuk ilişkisidir. Gizil değişkenlerin göstergeleri için parselleme yöntemi kullanılmıştır (Şekil 2). Test edilen ölçüm modelinde, standardize edilmiş faktör yüklerinin anlamlı olduğu ve ölçüm modelinin veri ile iyi düzeyde uyum gösterdiği belirlenmiştir [χ^2 (48, n=270)=92,64 p<0,001; χ^2/df=1,93; GFI=0,95; düzeltilmiş GFI (AGFI)=0,91; NFI=0,97; NNFI=0,98; CFI=0,99; IFI=0,99; SRMR=0,039; RMSEA=0,059]. Düzeltme indeksleri doğrultusunda, teorik açıdan uygun olan anne bekçiliği değişkeninin göstergelerinden anne bekçiliği-kontrol boyutu-parsel 1'in (AB-K-P1) hata varyansı, AB-K-P2'nin hata varyansıyla ilişkilendirilmiştir. Yapılan bu düzeltme ile ölçüm modeli 2 test edilmiş olup, bu modelin veriye daha iyi uyum gösterdiği saptanmıştır [χ^2 (47, n=270)=57,91 p>0,05; χ^2/df=1,23; GFI=0,97; AGFI=0,94; NFI=0,98; NNFI=0,99; CFI=0,99; IFI=0,99; SRMR=0,033; RMSEA=0,029]. Ölçüm modeli 2 ile ilişkili değerler Şekil 2 ve Tablo 3'te sunulmuştur.

Ölçüm modelinin ardından yapısal model test edilmiş, standardize edilmiş faktör yüklerinin anlamlı olduğu ve modelin veriye iyi uyum sağladığı saptanmıştır modelin veriye iyi uyum sağladığı saptanmıştır [χ^2 (47, n=270)=57,91 p>0,05; χ^2/df=1,23; GFI=0,97; AGFI=0,94; NFI=0,98; NNFI=0,99; CFI=0,99; IFI=0,99; SRMR=0,033; RMSEA=0,029]. Ancak yapısal model 1'de helikopter ebeveynlikten ebeveyn tükenmişliğine giden yol katsayısının istatistiksel açıdan anlamsız olduğu görülmüştür (p>0,05). Anlamsız olan bu yol modelden çıkarılarak yapısal model 2 test edilmiş olup, bu modelin veriye daha iyi uyum gösterdiği bulunmuştur [χ^2 (48, n=270)=58,95 p>0,05; χ^2/df=1,23; GFI=0,96; AGFI=0,94; NFI=0,98; NNFI=0,99; CFI=0,99; IFI=0,99; SRMR=0,042; RMSEA=0,029]. Sınanan yapısal modellerden hangisinin veriye daha iyi uyum sağladığını belirlemek amacıyla ki-kare fark testi yapılmış ve iki model arasında istatistiksel bakımdan anlamlı bir fark olmadığı tespit edilmiştir (χ^2=1,04; df=1; p>0,05). YEM analizlerinde hem daha az yol içeren güçlü ve sade modelin, diğer bir deyişle df'i yüksek olan modelin, tercih edilmesi[45] hem de tüm yol katsayılarının anlamlı olması nedeniyle yapısal model 2'nin (Şekil 3) kabul edilmesinin daha uygun olacağı sonucuna varılmıştır.

Şekil 3'te görüldüğü üzere, helikopter ebeveynliğin hem anne bekçiliği aracılığıyla hem de doğrudan olumsuz anne-çocuk ilişkisini yordadığı saptanmıştır. Helikopter ebeveynliğin anne bekçiliğinden ebeveyn tükenmişliğine giden yol aracılığıyla da sıralı olarak olumsuz anne-çocuk ilişkisini yordadığı bulunmuştur. Ayrıca anne bekçiliğinin hem ebeveyn tükenmişliği aracılığıyla hem de doğrudan olumsuz anne-çocuk ilişkisini yordadığı da görülmüştür. Modelde ebeveyn tükenmişliğinin ise doğrudan olumsuz anne-çocuk ilişkisini yordadığı sonucuna ulaşılmıştır. Sınanan model ile anne bekçiliği sadece helikopter ebeveynlik tarafından açıklanırken (R^2=0,07); ebeveyn

Tablo 2. Korelasyon analizi sonuçları

Değişkenler	1	2	3	4	5
1. Helikopter ebeveynlik (toplam)	1				
2. Anne bekçiliği (engel)	0,20**	1			
3. Anne bekçiliği (kontrol)	0,27***	0,76***	1		
4. Ebeveyn tükenmişliği (toplam)	0,18**	0,35***	0,26***	1	
5. Olumsuz anne-çocuk ilişkisi	0,27***	0,42***	0,31***	0,30***	1

**p<0,01, ***p<0,001

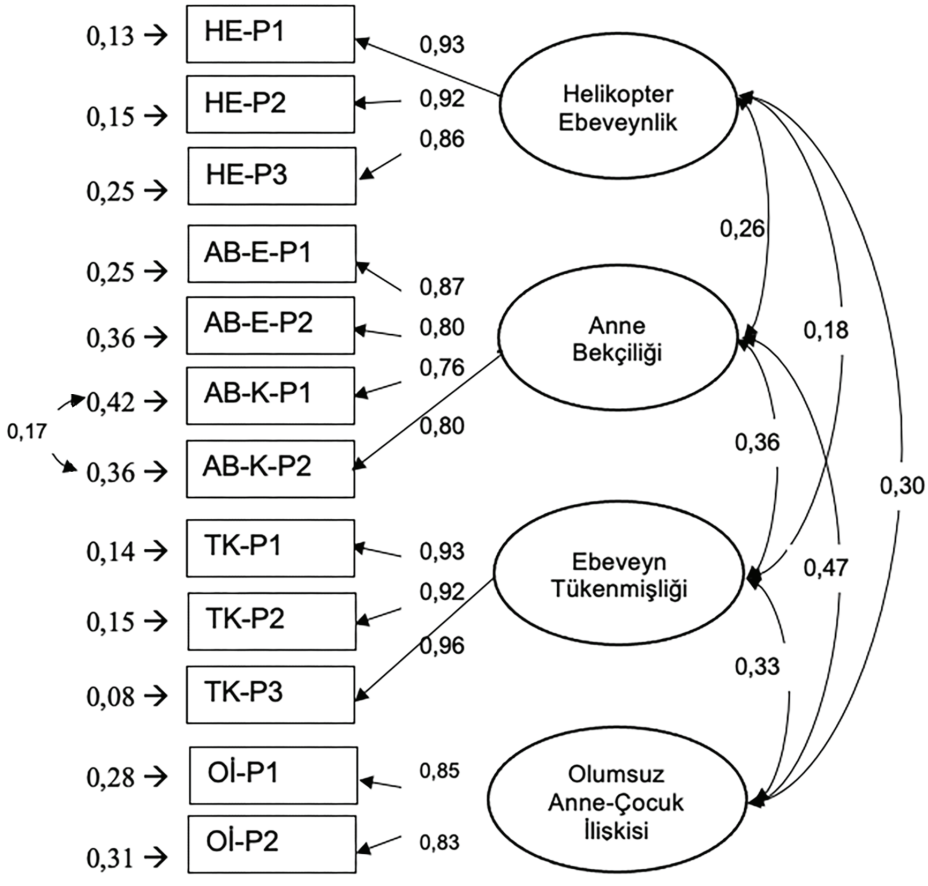
tükenmişliği de sadece anne bekçiliği tarafından açıklanmıştır (R^2=0,13). Son olarak olumsuz anne-çocuk ilişkisinin tüm değişkenler tarafından açıklandığı görülmüştür (R^2=0,28). Modeldeki dolaylı etkilerin anlamlılığı ise LISREL programının hesapladığı t değerleriyle değerlendirilmiş olup, doğrudan, dolaylı ve toplam etkiler Tablo 4'te sunulmuştur.

Tartışma

Araştırma sonucunda, helikopter ebeveynlik ile anne-çocuk ilişkisi arasında hem anne bekçiliğinin tek başına aracı rolü bulunduğu hem de anne bekçiliğinden ebeveyn tükenmişliğine giden yol ile değişkenlerin seri aracılık rolüne sahip olduğu saptanmıştır. Diğer bir deyişle, helikopter annelerin eşlerinin ebeveynliğine de müdahale etmesi, ebeveyn tükenmişliğini artırarak anne-çocuk ilişkisini olumsuz etkilemiştir. Ayrıca çalışmada aracı değişkenlerin rolüne rağmen, helikopter ebeveynliğin anne-çocuk ilişkisini doğrudan da yordadığı sonucuna ulaşılmıştır.

Modelde ilk olarak, helikopter ebeveynliğin annenin olumsuz bekçiliğini doğrudan yordadığı görülmektedir. Hem helikopter ebeveynlik hem de olumsuz yöndeki anne bekçiliği, annelerin kontrol ve yönlendirme biçimlerini ele alan kavramlar olup, özellikle kültürel bağlamda birbirini pekiştiren ve güçlendiren unsurlar olarak karşımıza çıkabilmektedir. Mevcut sonuç, helikopter ebeveynliğin, diğer aile üyelerine karşı da eleştirel ve olumsuz tutumların olduğu bir aile ortamında meydana gelmiş olmasından kaynaklanmış olabilir.[46] Ayrıca çocukların özerkliğini kısıtlamaya çalışan annelerin,[8] bu sonuca ulaşmalarının önünde engel olarak gördüğü babalar için onların ebeveynliğini denetlemesi ve çocuk ile etkileşimini kısıtlaması muhtemeldir. Özellikle babaların çocuklarını keşfetmeye ve zorlukları üstlenmeye teşvik ederek özerklik geliştirmelerine yardımcı olabilecek tarzda ebeveynlik yapmaları daha olası olduğundan[47] helikopter anneler, eşlerinin ebeveynlik rollerine katılımlarını sınırlayacak şekilde olumsuz bekçilik davranışlarında bulunmuş olabilirler. Bu bulgu, babayı yetersiz gören annelerin, çocuklarına uygun bakım sağlamak için daha fazla sorumluluk alırken engelleyici bekçilik davranışı sergilediklerini gösteren Allen ve Hawkins[48] ile Tu ve ark.'nın[49] çalışma sonuçlarıyla da uyumludur.

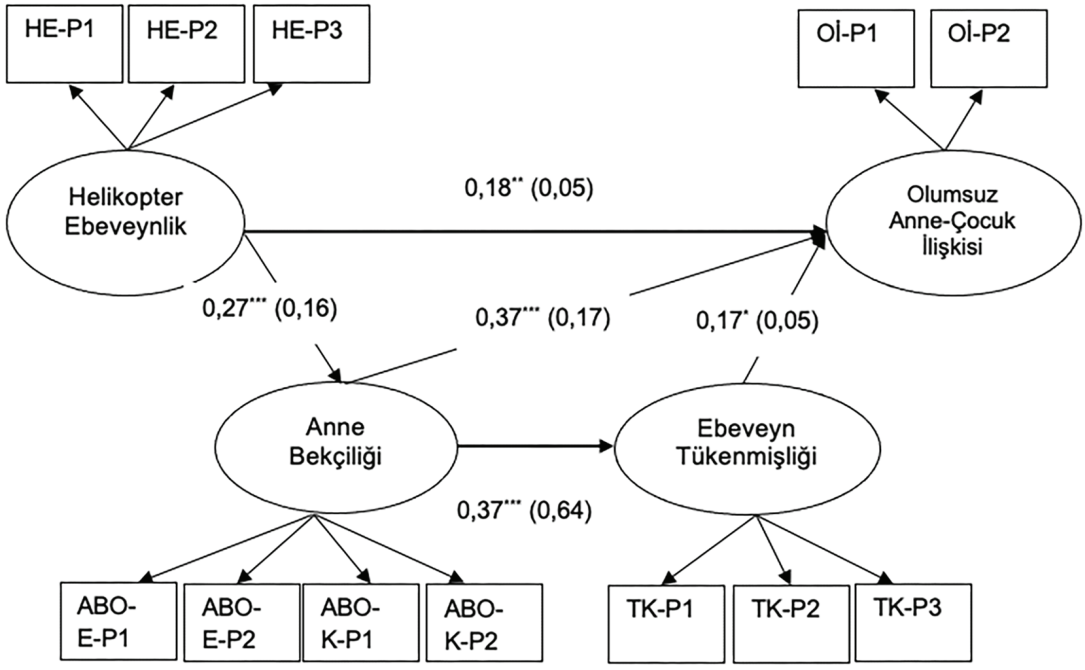
Bu çalışmada annenin olumsuz yöndeki bekçiliğinin ebeveyn tükenmişliğini olumlu yönde yordadığı sonucuna ulaşılmıştır. Olumsuz bekçilik davranışlarında bulunan helikopter annelerin, bireysel ihtiyaçlarını göz ardı etmesine[14] ya da ev ve çocukla ilgili kararlarda kontrolü ellerinde tutmalarının[50] sürdürülemez bir iş yüküne ve duygusal gerginliğe yol açmasından[51] kaynaklı bu yönde bir sonuç elde edilmiş olabilir. Ayrıca, aile işlevinin



Şekil 2. Ölçüm modeli 2 için standardize çözümleme değerleri
HE: Helikopter ebeveynlik, P: Parsel, AB: Anne bekçiliği E: Engel Boyutu, K: Kontrol boyutu, TK: Ebeveyn tükenmişliği, Oİ: Olumsuz anne-çocuk ilişkisi

tükenmişliği hafifletici rolü göz önüne alındığında,[52] olumsuz bekçiliğin bu işlevi azaltarak tükenmişliği artırması muhtemeldir. Eşlerinin çocukla etkileşimini engelleyen ve ebeveynliği tek başına üstlenen annelerin daha yüksek tükenmişlik yaşaması, işbirlikçi ebeveynliğin eksikliğinin tükenmişliği artırdığına dair alanyazınla tutarlıdır.[53] Bu bulgu, engelleyici bekçiliğin daha yüksek tükenmişliğe yol açtığını gösteren Pedersen'in[54] çalışmasıyla da uyumludur.

Araştırmada annenin olumsuz bekçiliğinin, anne-çocuk ilişkisini olumsuz yönde yordadığı bulunmuştur. Annenin



Şekil 3. Yapısal model 2'nin nihai haline ilişkin standardize çözümleme değerleri [unstandardize (standartlaştırılmamış) değerler] *p<0,05, **p<0,01, ***p<0,001, HE: Helikopter ebeveynlik, P: Parsel, AB: Anne bekçiliği E: Engel Boyutu, K: Kontrol boyutu, TK: Ebeveyn tükenmişliği, Oİ: Olumsuz anne-çocuk ilişkisi

Tablo 3. Ölçüm modeli 2'nin faktör yükleri, standart hata ve t değerleri ile açıkladıkları varyanslar

	Unstandardize faktör yükleri	SH	t	Standardize faktör yükleri	R^2
Helikopter ebeveynlik					
HE-P1	1,00	0,96	5,85	0,93	0,87
HE-P2	0,98	0,04	24,60	0,92	0,85
HE-P3	0,91	0,04	21,55	0,86	0,75
Anne bekçiliği					
AB-E-P1	1,00	0,64	6,35	0,87	0,75
AB-E-P2	0,93	0,06	14,81	0,80	0,64
AB-K-P1	0,85	0,06	13,61	0,76	0,58
AB-K-P2	0,98	0,07	14,54	0,80	0,64
Ebeveyn tükenmişliği					
TK-P1	1,00	0,76	8,02	0,93	0,86
TK-P2	1,26	0,05	27,32	0,92	0,85
TK-P3	1,22	0,04	30,39	0,96	0,92
Olumsuz anne-çocuk ilişkisi					
Oİ-P1	1,00	0,28	3,76	0,85	0,72
Oİ-P2	0,78	0,08	9,22	0,83	0,69

SH: Standart hata, Unstandardize: Standartlaştırılmamış, HE: Helikopter ebeveynlik, P: Parsel, AB: Anne bekçiliği E: Engel boyutu, K: Kontrol boyutu, TK: Ebeveyn tükenmişliği, Oİ: Olumsuz anne-çocuk ilişkisi

Tablo 4. Yapısal model 2 için doğrudan, dolaylı ve toplam etkiler			
	Standart dışı	**SH**	**t**
Doğrudan etkiler			
Bağımsız değişkenin diğer değişkenler üzerindeki doğrudan etkisi (gamma)			
Helikopter ebeveynlik → anne bekçiliği	0,16	0,04	4,03***
Helikopter ebeveynlik → olumsuz anne-çocuk ilişkisi	0,05	0,02	2,75**
Diğer değişkenlerin birbiri üzerindeki doğrudan etkisi (beta)			
Anne bekçiliği → ebeveyn tükenmişliği	0,64	0,11	5,68***
Anne bekçiliği → olumsuz anne-çocuk ilişkisi	0,17	0,04	4,84***
Ebeveyn tükenmişliği → olumsuz anne-çocuk ilişkisi	0,05	0,02	2,50*
Dolaylı etkiler			
Bağımsız değişkenin diğer değişkenler üzerindeki dolaylı etkisi (KSI *on* ETA)			
Helikopter ebeveynlik → ebeveyn tükenmişliği	0,10	0,03	3,35***
Helikopter ebeveynlik → olumsuz anne-çocuk ilişkisi	0,03	0,01	3,39***
Diğer değişkenlerin birbiri üzerindeki dolaylı etkisi (ETA *on* ETA)			
Anne bekçiliği → olumsuz anne-çocuk ilişkisi	0,03	0,01	2,33*
Toplam etkiler			
Bağımsız değişkenin diğer değişkenler üzerindeki toplam etkisi (KSI *on* ETA)			
Helikopter ebeveynlik → olumsuz anne-çocuk ilişkisi	0,08	0,02	4,28***
Helikopter ebeveynlik → anne bekçiliği	0,16	0,04	4,03***
Helikopter ebeveynlik → ebeveyn tükenmişliği	0,10	0,03	3,35***
Diğer değişkenlerin birbiri üzerindeki toplam etkisi (ETA *on* ETA)			
Anne bekçiliği → olumsuz anne-çocuk ilişkisi	0,20	0,03	5,89***
Anne bekçiliği → ebeveyn tükenmişliği	0,64	0,11	5,68***
Ebeveyn tükenmişliği → olumsuz anne-çocuk ilişkisi	0,05	0,02	2,50*

*: p<0,05, **: p<0,01, ***: p<0,001, SH: Standart hata, Unstandardize: Standartlaştırılmamış, KSI: Gizil dışsal (bağımsız) değişken, ETA: Gizil içsel (bağımlı) değişken

olumsuz yöndeki bekçiliğinin, çiftler arasında birlikte ebeveynlik süreçlerinin düşük olmasına yol açabildiği[55] ve eşlerin çocuk yetiştirmeye yönelik azalan birlikte ebeveynlik süreçlerinin de aile işlevlerini ve atmosferini etkileyebildiği göz önünde bulundurulduğunda,[16-18] anne-çocuk ilişkisinin bundan etkilenmiş olması beklendik bir bulgudur. Bu bağlamda, olumsuz bekçilik ile ilişkilerine olumsuz duygular aktaran ve ebeveynliklerinde daha az duyarlı olan anneler ebeveyn-çocuk alt sisteminde olumsuzluğa ve duygusal erişilmezliğe neden olmuş olabilir.[56] Yanı sıra, annelerin eşlerine bekçilik uygulaması, çocuğun babasıyla etkileşiminin kısıtlanmasına da yol açtığı için[57] babasıyla annesinden kaynaklı olarak zaman geçiremeyen çocuğun annesine olumsuz duygular hissetmiş olması, böylece anne ve çocuk arasındaki ilişkinin bozulmuş olması da muhtemeldir.

Modelden elde edilen diğer bir sonuç, ebeveyn tükenmişliğinin doğrudan olumsuz anne-çocuk ilişkisini olumlu yönde yordamış olmasıdır. Bu bulgu, tükenmiş ebeveynlerin çocuklarıyla olan ilişkilerinde daha az yer aldığını, ebeveynlik rolünde duygusal kopmalar yaşadığını ve ebeveynlikten algıladıkları doyumun azaldığını ortaya koyan Roskam ve ark.[27] ile Zimmermann ve ark.[28] çalışma sonuçları ile paralellik göstermektedir. Dahası, ebeveyn tükenmişliğinin aile ilişkilerini engellediğini gösteren Mikolajczak ve ark.[58] çalışma sonucuyla örtüşmektedir. Tükenmiş annelerin sevgilerini göstermekte zorlanması ve çocuklarıyla geçirdikleri zamandan daha az doyum alması beklenen bir sonuçtur. Çünkü; uzun süreli ebeveynlik stresi, duygusal kaynakların tükenmesine yol açarak annelerin çocuklarına yeterli duygusal destek verememesine neden olabilir.[23] Ayrıca, ebeveyn tükenmişliğinin fiziksel ve zihinsel yorgunlukla ilişkili olması,[23] annelerin empati ve sabır kapasitesini azaltarak olumsuz anne-çocuk etkileşimlerini artırmış olabilir. Nitekim mevcut sonuç, ebeveynlik stresinin aile sisteminin tümüne zarar verdiğini belirten Crnic ve Booth[59] ile Hobfoll'un[60] çalışma sonuçlarıyla uyumludur.

Son olarak modeldeki aracı etkilere rağmen helikopter ebeveynliğin olumsuz anne-çocuk ilişkisini doğrudan da yordamaya devam etmesi, bu ebeveynlik biçiminin, annelerin çocuklarıyla olan ilişkisi üzerinde ne denli önemli olduğunu göstermektedir. Mevcut sonuç, helikopter ebeveynliğin hem ebeveyn hem çocuk açısından olumsuz sonuçları olduğunu belirten Segrin ve ark.[11] çalışmasıyla benzerlik göstermektedir. Dahası, Ahmad ve ark.[61] ebeveynlerin çocuğun ihtiyaçlarını engelleyici davranışlarının çocuklarıyla ilişkilerinde daha az

yakınlığın olmasına yol açtığını belirten çalışma sonucuyla da paraleldir. Annelerin aşırı kontrolü ve mükemmeliyetçiliği, çocuklarında hem baskı yaratarak hem de onların anneye öfke duymasına neden olarak olumsuz anne-çocuk ilişkisini pekiştirmiş olabilir.[62] Dahası, helikopter ebeveynliğin çocuk için koşullu kabul ortamı yaratması, anne-çocuk ilişkisinde güven sorunlarına ve artan çatışmalara yol açmış olabilir.[63]

Çalışmanın Sınırlılıkları

Mevcut araştırmanın temel katkısı, ilköğretim birinci kademede çocukları olan annelerde helikopter ebeveynliğin olumsuz anne-çocuk ilişkisi ile ilişkisinde anne bekçiliğinin ve ebeveyn tükenmişliğinin aracı rolünü sınayan öncü bir araştırma olmasının altında yatmaktadır. Bu araştırmadan elde edilen sonuçların, helikopter ebeveynliği ve dolaylı olarak annenin olumsuz bekçiliği ile ebeveyn tükenmişliğini azaltarak anne-çocuk ilişkisini desteklemeyi amaçlayacak müdahale programlarına rehberlik etmesi beklenmektedir.

Çalışmanın kısıtlı sayıdaki annelerle gerçekleştirilmiş olması ve örneklemde temel alınan dahil edilme ve dışlama ölçütleri nedeniyle homojen bir örneklem profili ile çalışılması, araştırmanın sınırlılıklarının başında gelmektedir. Araştırmada anne bekçiliği ile anne-çocuk ilişkisinin sadece olumsuz boyutlarına odaklanılmış olması da çalışmanın bir sınırlılığıdır. Araştırmanın diğer bir sınırlılığı ise çalışmada annelerden elde edilen ölçümlerin öz-bildirime dayalı olmasıdır. Son olarak araştırmanın kesitsel desende yapılmış olması, çalışmanın başka bir sınırlılığını oluşturmaktadır.

Sonuç

Annelerin helikopter ebeveynliğinin, anne bekçiliğini ve buna bağlı olarak tükenmişlik düzeylerini artırarak ailenin iç işleyişinde dengeyi bozduğunu ve ebeveyn-çocuk ilişkisinin sağlıklı gelişimini engellediğini söylemek mümkündür. Tüm bu bulgular, helikopter ebeveynliğin aile içi ilişkiler üzerindeki geniş kapsamlı etkileri bulunduğuna işaret etmektedir. Bu nedenle mevcut araştırma hattını devam ettirmek ve ebeveynleri bu konuda bilinçlendirmek önemlidir. Özellikle ebeveynlere kendilerine zaman ayırmaları, sosyal destek sistemlerini güçlendirmeleri ve çocukları ile kendi ihtiyaçlarını dengelemeleri önerilebilir. Gelecek araştırmalarda ise anne bekçiliğinin ve anne-çocuk ilişkisinin olumlu yönlerini de ele alarak değişkenler arasındaki ilişkilerin genişletilmesinin alanyazına katkı sağlayacağı düşünülmektedir. İleride yapılacak çalışmalarda farklı gelişim dönemlerinde çocuğu olan bireylerin helikopter ebeveynlik davranışlarının incelenmesi ve boylamsal çalışmalar gerçekleştirilmesi de önerilebilir.

Etik

Etik Kurul Onayı: Bu araştırma, Samsun Üniversitesi Etik Kurulu'ndan alınan izinle (karar no: 2024-73, tarih: 19.09.2024) yürütülmüştür.

Hasta Onayı: Ölçek sorularına geçmeden önce çevrimiçi bağlantıda katılımcılara bilgilendirilmiş onam formu sunulmuştur.

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The Relationship Between Inflated Responsibility Attitude and Thought-Action Fusion in Young Adults

Genç Yetişkinlerde Abartılmış Sorumluluk Tutumu ile Düşünce Eylem Kaynaşması Arasındaki İlişki

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ABSTRACT

Objectives: This study aims to examine the relationship between inflated responsibility attitude and thought-action fusion in young adults.

Materials and Methods: The study employed a correlational survey design. The study sample consisted of 263 young adults selected through purposive sampling. The relationship between thought-action fusion and responsibility attitude was examined using multiple linear regression analysis with the backward elimination method.

Results: A one-unit increase in responsibility attitudes was associated with increases of 0.415, 0.194, and 0.439 units in total, likelihood, and moral thought-action fusion levels, respectively ($p<0.01$). Additionally, males had a 0.159-unit lower likelihood of thought-action fusion compared to females ($p<0.01$).

Conclusion: The findings indicate that responsibility attitudes are a significant factor in increasing levels of thought-action fusion and that gender is associated with differences, particularly in the likelihood dimension of thought-action fusion. Based on these findings, cognitive restructuring-based psychoeducational programs should be developed and implemented to help young adults modify rigid responsibility beliefs. Interventions should be gender-sensitive.

Keywords: Young adult, inflated responsibility attitude, thought-action fusion

ÖZ

Amaç: Bu çalışma, genç yetişkinlerde abartılmış sorumluluk tutumu ile düşünce eylem kaynaşması arasındaki ilişkiyi incelemeyi amaçlamaktadır.

Gereç ve Yöntem: Araştırmanın tasarımı ilişkisel tarama modelidir. Araştırmanın örneklemini 263 genç yetişkin oluşturmuş olup araştırmada amaçlı örnekleme yöntemi kullanılmıştır. Düşünce eylem kaynaşması ile sorumluluk tutumu arasındaki ilişki geriye doğru eleme yöntemi kullanılarak çok değişkenli doğrusal regresyon analiziyle incelenmiştir.

Bulgular: Sorumluluk tutumları düzeyindeki 1 birimlik artışın, toplam düşünce eylem kaynaşması, olasılık düşünce eylem kaynaşması ve ahlaki düşünce eylem kaynaşması düzeyini sırasıyla 0,415, 0,194 ve 0,439 birim artırdığı belirlenmiştir ($p<0,01$). Erkeklerin olasılık düşünce eylem kaynaşması düzeyinin kadınlara kıyasla 0,159 birim daha düşük olduğu saptanmıştır ($p<0,01$).

Sonuç: Çalışmanın sonuçları, sorumluluk tutumlarının düşünce eylem kaynaşması düzeylerini artırmada önemli bir faktör olduğunu ve cinsiyetin özellikle olasılık düşünce eylem kaynaşması düzeyinde farklılaşmalara yol açtığını göstermektedir. Bu bulgular doğrultusunda, gençlerin katı sorumluluk inançlarını esnetmeye yönelik bilişsel yeniden yapılandırma temelli psikoeğitim programları geliştirilmeli ve uygulanmalıdır. Müdahaleler cinsiyete duyarlı olmalıdır.

Anahtar Kelimeler: Genç yetişkin, abartılmış sorumluluk tutumu, düşünce eylem kaynaşması

Introduction

Young adulthood is a critical developmental stage during which individuals strive to complete their identity development, assume academic and professional responsibilities, and shape their social relationships, all while undergoing various cognitive and emotional processes in response to internal and external pressures.[1,2] Specifically, an inflated sense of responsibility can lead individuals to feel overwhelmed and to develop erroneous beliefs.[3] An inflated-responsibility attitude is defined as an individual's perception of being more responsible than necessary,

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to the point of holding themselves accountable for events they cannot control.[4] This cognitive distortion leads individuals to believe they have excessive influence over the safety, happiness, or overall well-being of others and is often associated with psychological issues such as anxiety disorders, obsessive-compulsive disorder (OCD), perfectionism, and depression.[5,6] Even when an individual cannot directly influence the course of events, they may take responsibility for potential negative outcomes, which can lead to intense anxiety. For instance, a person may be excessively cautious to avoid saying something that could upset a friend, or they may blame themselves, believing that a mistake would have serious consequences for others.[3]

One of the beliefs associated with an inflated responsibility attitude is thought-action fusion (TAF), the conviction that one's thoughts are directly linked to actions or reality.[7] TAF is a cognitive distortion strongly associated with OCD and can provoke guilt, avoidance behaviors, and persistent rumination.[8] Moreover, as young adults face mounting academic, social, and professional demands, their heightened sense of responsibility may exacerbate these distortions—highlighting the importance of early coping strategies and resilience training.[2,9] In this context, examining the relationship between inflated responsibility attitude and TAF in young adults is important. These cognitive distortions can negatively affect individuals' psychological well-being, contributing to the development of anxiety disorders, depression, and obsessive-compulsive symptoms.[9,10]

In the psychology literature, the inflated-responsibility attitude is defined as a thought pattern in which an individual feels excessively responsible, even for situations beyond their control.[4] Such perceptions of responsibility are particularly common among individuals diagnosed with OCD. Patients with OCD tend to assume responsibility for negative events and may engage in repetitive thoughts and behaviors to prevent potential negative outcomes.[3] Similarly, TAF leads an individual to believe that the mere presence of a thought increases the likelihood of the associated action occurring. This concept, developed by Rachman[8] can manifest in two different forms: likelihood fusion and moral fusion. Likelihood fusion refers to the belief that a negative thought entering one's mind increases the probability that the corresponding event will occur.[3,8] Such a belief can heighten an individual's anxiety and lead them to fear their thoughts. For example, if a person anticipates that something bad will happen to their loved ones, they may be convinced that it will occur.[3] In this case, the individual may believe that merely having such thoughts could trigger negative events. This can lead the person to avoid bringing certain thoughts to mind or to attempt to suppress them. However, the effort to suppress thoughts often results in them occurring more frequently and intensely.[11] Moral fusion, on the other hand, is the belief that having a thought is equivalent to acting upon that thought. This belief can lead the individual to feel unnecessarily guilty.[3,8] For example, when a person thinks about harming someone else, instead of viewing it merely as a thought, they may see themselves as a bad person.[3] If they perceive their thoughts as a reflection of their character or moral values, they may experience guilt or shame. This can lead an individual to constantly judge themselves and to become overly sensitive to negative thoughts.[11] While likelihood fusion can increase anxiety, leading to constant checking and preventive behaviors, moral fusion can cause individuals to continuously judge themselves and to feel guilty. In both cases, individuals believe they have greater control over their thoughts than they actually do and may experience increased anxiety when attempting to manage them.[9,11,12]

Studies have shown that TAF is particularly associated with perfectionism, moral rigidity, and anxiety disorders.[9,10] Previous studies have shown that an inflated-responsibility attitude and TAF are particularly associated with obsessive-compulsive symptoms.[3,10,13,14] However, studies examining the direct relationship between these two variables are limited. Additionally, how this relationship develops in young adults and which factors influence it remain insufficiently explored. Although the existing literature provides valuable insights into how inflated-responsibility attitudes and TAF function as independent variables, a significant gap remains in understanding how these constructs interact to constitute a risk factor for young adults. A large proportion of studies have focused on individuals with OCD.[12,13] However, few studies have examined how these cognitive distortions emerge in young adults who do not exhibit clinical levels of psychopathology, and how they affect their daily lives. As young adults shape their futures, they may be more influenced by such cognitive processes. Furthermore, most of the existing studies are limited to clinical populations. However, inflated-responsibility attitudes and TAF are not limited to clinical groups and are commonly observed across the general population.[3,9] Although the relationship between these two variables has been addressed in the literature, more studies are needed to understand how they interact in young adults and the direction of this relationship. Therefore, this study aims to fill this gap in the literature by examining the relationship between the inflated-responsibility attitude and TAF in young adults.

The findings of this study may enhance the understanding of how inflated-responsibility attitudes and TAF interact in young adults by clarifying the cognitive mechanisms underlying this relationship. Such insights could contribute to theoretical frameworks explaining how cognitive distortions develop and how individuals assign meaning to their thoughts. Moreover, a clearer understanding of this interaction may support the development of early intervention strategies targeting maladaptive cognitive patterns. Ultimately, the study aims to provide a more comprehensive perspective on the structure of cognitive processes in young adults, taking into account individual differences and non-clinical manifestations.

Materials and Methods

Type of the Study

The study design is based on a cross-sectional correlational survey model.

Study Questions

1. Is there a relationship between young adults' responsibility attitudes and the overall level of TAF?

2. Is there a relationship between young adults' responsibility attitudes and the likelihood TAF level?

3. Is there a relationship between young adults' responsibility attitudes and the moral TAF level?

Population and Sample

The study population consisted of young adults residing in Türkiye. The sample size was determined using the G*Power 3.1.9.2 program (Heinrich-Heine-Universität Düsseldorf, Germany). Based on a 95% confidence interval, 95% statistical power, and a correlation coefficient of p=0.530 between moral TAF and responsibility attitudes,[12] the required sample size was calculated to be at least 194 participants. This correlation coefficient (p=0.530) was derived from the findings of Altın and Gençöz[12] who reported a significant positive correlation between moral TAF and responsibility attitudes in a non-clinical sample. As the current study also targeted a similar population, this value was considered an appropriate estimate for the power analysis. The study included 263 young adults. In the current study, the correlation coefficient between responsibility attitudes and moral TAF was found to be p=0.439. Based on this result, the post-hoc analysis showed that, with a 95% confidence interval and a sample size of 263 participants, the power of the test was 98%. The study employed a non-probability sampling method, specifically the convenience sampling technique. Participants were recruited through social media platforms such as WhatsApp, Instagram, and Facebook. The online survey was shared in various student and youth community groups; however, no systematic control over regional representation was applied. Therefore, the geographic distribution of participants across Türkiye's regions could not be precisely determined. Eight participants were excluded from the study because of missing data. The inclusion criteria for the study were age 18-25 (young adulthood) and willingness to participate.

Data Collection Tools

Information Form

The form prepared by the researchers contains 8 questions, based on the review of previous studies.[9,12]

The Responsibility Attitudes Scale (RAS) is a self-report scale developed to assess individuals' beliefs and attitudes about responsibility. This scale aims to measure people's perceptions of responsibility and the importance they attach to their responsibilities. It specifically focuses on identifying individuals' attitudes toward thoughts of harming themselves or others and their efforts to prevent such harm. The scale was developed by Salkovskis et al.[4] It consists of 26 items and uses a 7-point Likert-type scale. Participants indicated their level of agreement with the items by selecting an option ranging from "strongly disagree" (1) to "strongly agree" (7). The scale is generally considered to have a unidimensional structure. There is no cut-off point. The score that can be obtained from the scale varies between 1 and 7. Higher scores indicate an exaggerated, rigid, or maladaptive sense of responsibility, while lower scores reflect a more flexible and adaptive sense of responsibility. The scale does not include reverse-scored items, so all items are evaluated in the same direction. Yorulmaz et al.[3] who conducted the Turkish standardization of the scale, calculated the test-retest reliability to be 0.94 and the internal consistency to be 0.92. In this study, Cronbach's alpha, an internal consistency coefficient, was 0.93.

Thought-Action Fusion Scale: The scale developed by Shafran[7] consists of 19 items using a five-point Likert-type scale (0-4). The Turkish standardization of the scale was conducted by Yorulmaz et al.[15] in 2004, and the sub-dimensions TAF-likelihood (7 items) and TAF-others (12 items) were examined. When the scale was first developed, Shafran[7] examined the scale under three subcategories: TAF-likelihood-self, TAF-likelihood-others, and TAF-moral. The TAF Scale is a self-report tool developed to measure how individuals assess the relationship between thoughts and actions, and the psychological effects of this perception. TAF refers to the tendency to believe that an intrusive thought increases the likelihood that it will occur or that the thought is morally unacceptable. The Cronbach's alpha reliability coefficients of the scale were calculated as 0.92 for the TAF-likelihood subdimension and 0.88 for the TAF-moral subdimension.[15] The likelihood sub-dimension consists of items 2, 3, 8, 10, 13, 16, and 17. The moral sub-dimension includes items 1, 4, 5, 6, 7, 9, 11, 12, 14, 15, 18, and 19. The likelihood sub-dimension evaluates the tendency to believe that an intrusive thought increases the probability of it occurring, while the TAF-moral sub-dimension measures the tendency to believe that negative thoughts are as morally wrong as harmful actions. Sub-dimension scores can be calculated separately. The score ranges for the likelihood and moral sub-dimensions are 0-28 and 0-48, respectively. The total score of all items ranges from 0 to 76, with higher scores indicating a stronger tendency for TAF. The scale does not include reverse-scored items; all items are evaluated in the same direction. There is no specific cutoff point for the scale.[15] In the current study, the Cronbach's alpha reliability coefficients for total TAF, likelihood TAF, and moral TAF were calculated as 0.91, 0.94, and 0.91, respectively.

Statistical Analysis

The data were analyzed using SPSS 23.0 software (IBM Corp., Armonk, NY, USA). An independent samples t-test was used to compare mean TAF scores for variables with two groups, while a one-way ANOVA was applied to variables with more than two groups. Tukey's B and Dunnett's C tests were used for post-hoc analyses. Relationships among continuous variables were examined using Pearson correlation analysis, and the effects on total TAF, likelihood TAF, and moral TAF were investigated using backward multiple linear regression analysis. The significance was set at $p<0.05$.

Ethical Considerations

Ethical approval for study was obtained from the Bandırma Onyedi Eylül University Health Sciences Non-Interventional Research Ethics Committee on 27.02.2025, with approval number 2025-19. Since the study data were collected through online platforms, institutional permission was not required. The aim and process of the study were explained in writing to the young adults, and written consent for participation was obtained through an online form. The study was conducted in accordance with the Declaration of Helsinki.

Results

The young adults had a mean age of 22.60±1.62 years (min: 20, max: 25); 75.7% were female, 91.6% were single, 89.7% had a bachelor's degree, and 72.6% perceived their income level as average. Additionally, 87.8% were not employed, 77.9% had no chronic illnesses, and 73% perceived that they had an adequate level of social support (Table 1). The mean score for the likelihood subdimension in males was lower than in females, whereas the mean score for the moral subdimension was higher ($p<0.05$). Young adults who reported having a bachelor's degree had significantly lower mean scores for total TAF and for the moral sub-dimension than those who reported having a high school or vocational education ($p<0.01$). The mean moral sub-dimension score of working participants was higher than that of non-working participants ($p<0.05$). No significant differences were found between the total TAF score, sub-dimension average scores, and other variables ($p>0.05$) (Table 1).

The mean total RAS score for young adults was 3.93±1.12. The mean total TAF score was 24.74±15.40. The average scores of the likelihood and moral TAF sub-dimensions were 4.61±6.33 and 20.12±12.12, respectively (Table 2).

A moderate, positive, and statistically significant relationship was found between the total RAS score and the total TAF score ($r=0.415$, $p<0.001$). Similarly, a positive, statistically significant relationship of small-to-moderate magnitude was found between the total RAS score and the likelihood TAF ($r=0.168$, $p<0.001$) and moral TAF ($r=0.439$, $p<0.001$) sub-dimension scores. No significant relationships were found between age and the total TAF and RAS scores ($p>0.05$) (Table 3).

The results of the regression analysis identifying the factors affecting the total TAF level and its sub-dimensions are shown in Table 4. The variables included in the model explained 16.9%, 4.5%, and 19% of the total variance in the total, likelihood, and moral TAF levels, respectively (total adjusted $R^2=0.169$; likelihood adjusted $R^2=0.045$; moral adjusted $R^2=0.190$; $p<0.001$). A 1-unit increase in responsibility attitudes increased total, likelihood, and moral TAF levels by 0.415, 0.194, and 0.439 units, respectively ($p<0.01$) (Table 4). It was found that the TAF level in men was 0.159 units lower than in women ($p<0.01$) (Table 4).

Table 1. Distribution of individual characteristics and comparison of thought-action fusion mean scores in young adults (n=263)

			Total		Likelihood		Moral	
Variables	**Number (n)**	**Percentage (%)**	**$\bar{x}$**	**±SD**	**$\bar{x}$**	**±SD**	**$\bar{x}$**	**±SD**
Age			22.60	1.62				
Marital status								
Married	22	8.4	28.13	18.67	4.95	8.07	23.18	12.41
Single	241	91.6	24.43	15.08	4.58	6.16	19.84	12.08
t/F			t=1.080		t=0.261		t=1.208	
p			p=0.281		p=0.209		p=0.238	
Gender								
Female	199	75.7	24.33	15.90	5.07	6.70	19.26	11.98
Male	64	24.3	26.01	13.77	3.20	4.77	22.81	12.26
t/F			t=-0.760		t=2.446		t=-2.050	
p			p=0.448		**p=0.01**		**p=0.041**	
Education level								
High school[c]	11	4.2	33.81	22.34	6.18	8.62	27.63	17.56
Associate's degree[b]	16	6.1	33.06	16.63	6.31	7.98	26.75	11.01
Bachelor's degree[a]	236	89.7	23.75	14.70	4.42	6.09	19.32	11.69
t/F			F=4.866		F=1.014		F=5.168	
p			**p=0.008**[a<b,c]		p=0.364		**p=0.006**[a<b,c]	

Table 1. Continued

			Total		Likelihood		Moral	
Variables	**Number (n)**	**Percentage (%)**	**$\bar{x}$**	**±SD**	**$\bar{x}$**	**±SD**	**$\bar{x}$**	**±SD**
Perceived income level								
Poor[a]	37	14.1	22.29	14.39	4.62	6.14	17.67	11.41
Medium[b]	191	72.6	24.87	15.40	4.74	6.40	20.13	11.73
Good[c]	35	13.3	26.57	16.56	3.88	6.22	22.68	14.56
t/F			F=0.719		F=0.273		F=1.541	
p			p=0.488		p=0.761		p=0.216	
Employment status								
Employed	32	12.2	31.78	19.26	6.37	8.59	25.40	13.80
Unemployed	231	87.8	23.76	14.57	4.37	5.93	19.39	11.72
t/F			t=2.266		t=1.276		t=2.350	
p			p=0.030		p=0.210		**p=0.024**	
Presence of chronic disease								
Yes	58	22.1	26.81	17.83	5.03	7.65	21.77	13.31
No	205	77.9	24.15	14.64	4.49	5.92	19.65	11.76
t/F			t=1.038		t=0.494		t=1.175	
p			p=0.302		p=0.623		p=0.241	
Perceived social support								
Adequate[a]	192	73.0	23.90	15.13	4.19	6.18	19.70	12.15
Partially adequate[b]	14	5.3	24.42	20.71	5.00	7.66	19.42	15.94
Inadequate[c]	57	21.7	27.64	14.77	5.92	6.42	21.71	11.05
t/F			F=1.307		F=1.679		F=0.630	
p			p=0.273		p=0.189		p=0.533	

Superscripts [a, b], and [c] indicate category labels under the corresponding variables and do not denote statistical significance. Any significant results, if present, are reported in the "p" row. F: One-way ANOVA test, t: Independent sample t-test, *: p<0.05, **: p<0.001, SD: Standard deviation

Table 2. The mean scores obtained from the scales by young adults (n=263)

Scales	X	±SD	Minimum	Maximum	Score range obtainable from the scale
RAS total*	3.93	1.12	1	7	1-7
TAF total**	24.74	15.40	0	74	0-76
Likelihood	4.61	6.33	0	28	0-28
Moral	20.12	12.12	0	48	0-48

*RAS total: Responsibility Attitude Scale total **TAF total: Thought-action fusion total, SD: Standard deviation

Table 3. The relationship between thought-action fusion, responsibility attitudes, and age in young adults (n=263)

Variables		Responsibility Attitude Scale	Age
Thought-action fusion total	r	0.415	-0.019
	p	**0.000****	0.761
Likelihood	r	0.168	-0.087
	p	**0.006***	0.159
Moral	r	0.439	0.021
	p	**0.000****	0.729

r: Pearson's correlation coefficient. *: p<0.05, **: p<0.001

Table 4. Factors affecting thought-action fusion in young adults (n=263)

Variables	Unstandardized coefficient		Standardized coefficient	t	p	95% confidence interval	
	B	Standard error	Beta			Lower	Upper
Thought-action fusion total							
Constant	2.388	3.155		0.757	0.450	2.388	3.155
Responsibility attitudes	5.675	0.770	0.415	7.369	0.000	5.675	0.770
F (1, 261)=54.298, p<0.001; adjusted R^2=0.169. Variables included in the regression model: responsibility attitudes, education level							
Likelihood							
Constant	0.887	1.390		0.639	0.524	0.887	1.390
Responsibility attitudes	1.091	0.344	0.194	3.172	0.002	1.091	0.344
Gender-male[a]	-2.336	0.901	-0.159	-2.592	0.010	-2.336	0.901
F (2, 260)=7.235, p<0.001; adjusted R^2=0.045, [a]: Reference category: female. Variables included in the regression model: responsibility attitudes, gender							
Moral							
Constant	1.493	2.452		0.609	0.543	1.493	2.452
Responsibility attitudes	4.730	0.598	0.439	7.904	0.000	4.730	0.598
F (1, 261)=62.466, p<0.001; adjusted R^2=0.190. Variables included in the regression model: responsibility attitudes, gender, education level							

Discussion

Results of the current study show that, as responsibility attitudes increase, total TAF level and its likelihood and moral subdimensions increase significantly. The findings indicate that a 1-unit increase in responsibility attitudes increases the total TAF level by 0.415 units, the likelihood sub-dimension by 0.194 units, and the moral sub-dimension by 0.439 units. This finding suggests that individuals with a higher sense of responsibility tend to associate their thoughts more closely with their actions. Compared with previous studies, these results are consistent with findings that cognitive distortions and moral evaluations can be influenced by individuals' perceptions of responsibility.[3,13,14] The results of a study conducted by Smári and Hólmsteinn[14] with a sample of university students, which aimed to examine the relationships between TAF, responsibility attitudes, unwanted thoughts, thought suppression, and obsessive-compulsive symptoms, showed that responsibility attitudes and thought suppression mediated the relationship between unwanted thoughts and obsessive-compulsive symptoms. Mediation analyses revealed that controlling for TAF produced results similar to those obtained when controlling for responsibility attitudes. This finding indicates that TAF is strongly associated with the perception of responsibility.[14] Similar results were obtained in a structural equation modeling analysis conducted by Marino et al.[13] Furthermore, a study by Altın and Gençöz[12] with Turkish university students found that individuals with high moral TAF levels tend to have a heightened sense of responsibility. Additionally, a study conducted by Zhu et al.[9] in China with young adults reported that an increase in inflated responsibility attitude is associated with higher levels of both likelihood and moral TAF.

The relationship between responsibility attitudes and both likelihood TAF and moral TAF can be explained by cognitive distortions and other psychological processes. Individuals with a high sense of responsibility tend to perceive their thoughts as events that must or should occur.[11] This can lead them to exaggerate the that their thoughts will occur likelihood. Likelihood TAF refers to an unrealistic overestimation of the probability that their thoughts will translate into actions.[9] An individual with a high sense of responsibility not only perceives a bad thought as inevitable but also overestimates the likelihood of that thought occurring. This process increases anxiety and strengthens the belief that the thoughts will come true. This, in turn, generates the fear of being responsible for negative outcomes. In this context, as the attitude of responsibility increases, individuals are more likely to evaluate their thoughts as higher-risk and unlikely.[12,13] Therefore, the relationship between responsibility attitudes and likelihood TAF explains how individuals' mental processes are guided by the fear that a thought will be transformed into action, thereby leading to increased stress and anxiety in their daily lives. However, in the multiple regression analyses conducted in this study, the variance explained by the likelihood TAF model was relatively low (adjusted R^2=0.045). This indicates that the predictor variable—responsibility attitudes—accounts for only a small portion of the variance in this sub-dimension. Although the regression coefficient was statistically significant, the explanatory power of the model is limited. Therefore, the practical impact of this relationship should be interpreted with caution. It is also important to note that other potentially influential variables frequently emphasized in the literature—such as anxiety levels, religious beliefs, cognitive flexibility, and thought suppression—were not included in the current model. Including these variables in future research could increase the model's explanatory power and provide a more comprehensive understanding of the mechanisms underlying likelihood-based TAF in young adults.

The relationship between attitudes toward responsibility and moral TAF can be explained by individuals' tendency to associate their thoughts with moral responsibility. Individuals with a strong sense of responsibility not only view negative or unwanted thoughts as mere mental processes but also perceive them as moral responsibilities. In other words, they may evaluate a negative thought as a moral mistake or a source of guilt.[11] This situation may give rise to moral TAF. The individual, believing that the thought will have moral consequences, assigns greater significance to it and experiences anxiety about assuming moral responsibility if it comes true. In this context, individuals with a strong sense of responsibility, while experiencing moral TAF, reinforce the idea that the negative thoughts they have may lead to moral consequences. They not only see these thoughts as a personal responsibility, but also perceive them as a heavy societal and moral burden.[9,11] For example, when a person experiences a negative thought, they may perceive it not only as a thought belonging to themselves, but also as a moral punishment imposed by society or by God. This can increase guilt and anxiety, thereby causing the individual to feel a greater sense of moral responsibility in their life. This relationship is further strengthened by cognitive distortions and moral evaluations. Individuals with a strong sense of responsibility, rather than avoiding their moral responsibilities, may experience greater guilt because they fear acting on their thoughts.[13] Consequently, the relationship between attitudes toward responsibility and moral TAF may explain how individuals associate their thoughts with moral responsibility, thereby experiencing increased anxiety and guilt.

It was found that the likelihood TAF level in men was 0.159 units lower than in women. The results of a study conducted by Yavuz et al.[16] in adolescents aged 11-17 showed no significant difference in TAF between genders. Similarly, in the study by Yorulmaz et al.[15] which examined the psychometric properties of the scale, no significant differences were found between genders in terms of total TAF, likelihood TAF, and moral TAF. Apart from these two studies, no other studies have been identified that directly examine differences in TAF between genders. One possible explanation—though not directly assessed in this study—relates to gender roles. Prior research suggests that men may be more likely to suppress emotional expressions and to approach cognitive experiences more practically or logically.[17] This could influence how they interpret the likelihood that their thoughts will translate into actions. However, these factors were not measured in the current study, and such interpretations should be treated with caution. Moreover, the sample exhibited an imbalanced gender distribution, which may have influenced the observed results and may limit the generalizability of gender-related findings.

Study Limitations

This study has some limitations. First, the study was conducted with a specific, and the generalizability of the findings to different populations or cultural contexts may be limited. Therefore, it is recommended that future studies examine larger and more diverse sample groups. Additionally, the data collection method used in this study is self-report-based and relies on participants' assessments. This may partially limit the accuracy of the results, which could be influenced by factors such as social desirability bias. Furthermore, the study's cross-sectional design precludes definitive establishment of causal relationships between the variables. Future studies using longitudinal methods to explore these relationships in greater depth would be beneficial. Lastly, the study focused on specific variables and excluded other potential influencing factors related to the topic. Therefore, it is recommended that future research consider additional individual and environmental variables to provide a more comprehensive analysis. One of the limitations of this study is the use of a non-probability sampling method, specifically convenience sampling. Although this technique facilitated the rapid collection of data, it may limit the generalizability of the findings to the broader young adult population in Türkiye. Since the participants were not randomly selected, the sample may not fully represent the demographic and psychological diversity of the entire target population. Future studies are encouraged to employ probability-based sampling techniques to enhance representativeness and external validity. Because participants were recruited via online platforms without controlling for regional representation, the geographic distribution of the sample remains unclear, which may limit the generalizability of the findings to all young adults across Türkiye. Another limitation of the study is the difference between the estimated effect size used in the power analysis (p=0.530) and the actual effect size obtained (p=0.439). Although the achieved statistical power remained sufficient, this discrepancy should be taken into account when interpreting the results. Furthermore, the sample consisted predominantly of individuals aged 20-25 years who were either university students or closely affiliated with academic institutions in Türkiye. This homogeneity in age and sociocultural background limits the generalizability of the findings to the broader population of young adults, particularly those from different educational, regional, or cultural contexts. The unequal gender distribution in the sample may have influenced the observed gender differences and may limit the generalizability of these findings.

Conclusion

The findings of this study indicate that responsibility attitudes have a significant positive impact on total, likelihood, and moral TAF levels. As responsibility attitudes increase, individuals' TAF levels also rise. Additionally, when evaluated by gender, it was found that men's likelihood of TAF levels was lower than women's. This finding reveals that women have a higher likelihood of TAF. Overall, the results of the study suggest that responsibility attitudes are an important factor in increasing TAF levels and that gender leads to differences, especially in the likelihood of specific TAF levels.

The findings of this study indicate that young adults' attitudes toward responsibility are significantly associated with TAF. In this context, it is recommended that psychoeducational programs targeting young adults comprehensively address

responsibility beliefs and TAF. Specifically, individuals should be supported in developing awareness of their excessive sense of responsibility and of how this perception may distort the link they form between thoughts and actions. Mental health professionals—particularly those working in university counseling centers, community mental health services, or youth support units—could integrate assessments of TAF levels when evaluating responsibility-related cognitive patterns, as this relationship may serve as an important intervention point in understanding and addressing obsessive-compulsive symptoms. The study also found that women had higher TAF-likelihood levels than men, highlighting the importance of incorporating gender-sensitive components into intervention programs. Moreover, the finding that individuals with lower educational attainment (e.g., those with high school diplomas or associate degrees) exhibited higher levels of moral TAF suggests that psychoeducational content should be adapted to different educational backgrounds to enhance accessibility and effectiveness. Given that the sample consisted of young adults in Türkiye, these recommendations may be particularly relevant to Turkish universities, youth centers, and community mental health centers. Implementing preventive and protective practices in these settings—such as workshops or group-based cognitive restructuring sessions—could contribute to the early identification of maladaptive responsibility beliefs and promote healthier cognitive patterns within this specific population. Moreover, the relatively low explanatory power of the model suggests that other psychological and contextual variables not included in this study—such as anxiety symptoms, levels of religious belief, the tendency to suppress intrusive thoughts, and perfectionistic traits—may also play a role in shaping TAF, particularly in its likelihood dimension. Future research incorporating these additional variables could offer a more comprehensive understanding of the factors contributing to this cognitive distortion in young adults.

Ethics

Ethics Committee Approval: Ethical approval for study was obtained from the Bandırma Onyedi Eylül University Health Sciences Non-Interventional Research Ethics Committee on 27.02.2025, with approval number 2025-19.

Informed Consent: Written consent for participation was obtained through an online form.

Footnotes

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Childhood Trauma as the Predictor of Emotional Intelligence in University Students

Üniversite Öğrencilerinde Duygusal Zekanın Yordayıcıları Olarak Çocukluk Çağı Travmaları

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ABSTRACT

Objectives: This study examined the predictive role of specific types of childhood trauma in emotional intelligence (EI) among university students, highlighting the significance of EI for managing life challenges and promoting well-being during this developmental stage. By exploring these relationships, the study seeks to inform targeted interventions that can support EI among students.

Materials and Methods: A total of 330 university students, aged between 18 and 44, were recruited from various academic departments to participate in this study. Data were collected via a self-administered survey that included a personal information form, the Childhood Trauma Questionnaire-Short Form, which measured experiences of emotional, physical, and sexual abuse as well as emotional and physical neglect, and the Trait Emotional Intelligence Questionnaire-Short Form, which assessed global trait EI. Hierarchical regression analysis was performed to evaluate the predictive influence of different trauma types on EI.

Results: The study found significant negative correlations between childhood trauma scores (including emotional, physical, and sexual abuse, as well as neglect) and EI scores. Hierarchical regression analysis indicated that childhood trauma, particularly emotional and sexual abuse, significantly predicted lower EI scores among university students.

Conclusion: These findings underscore the enduring impact of childhood trauma on emotional development and highlight the importance of early intervention and support to mitigate its negative effects on EI in adulthood. The study emphasizes the need for targeted interventions to enhance emotional competencies among university students with a history of childhood trauma.

Keywords: Childhood trauma, emotional intelligence, university students, predictive role

ÖZ

Amaç: Bu çalışmada üniversite öğrencilerinde duygusal zeka (DZ) yordayıcıları olarak çocukluk çağı travmalarının rolü incelenmiştir. Çalışma bu gelişim döneminde yaşam zorluklarını yönetebilmek ve iyi oluşu artırmak için DZ'nin önemini vurgulamaktadır. Çalışma, bu ilişkileri araştırarak, öğrenciler arasında DZ'yi destekleyebilecek hedefli müdahaleleri belirlemeyi amaçlamaktadır.

Gereç ve Yöntem: Bu çalışmaya katılmak üzere çeşitli akademik bölümlerden yaşları 18 ila 44 arasında değişen toplam 330 üniversite öğrencisi seçilmiştir. Veriler kişisel bilgi formu, duygusal, fiziksel ve cinsel istismar ile duygusal ve fiziksel ihmali ölçen Çocukluk Dönemi Örselenme Yaşantıları Ölçeği-Kısa Formu ile DZ'yi ölçen Duygusal Zeka Özellikleri Ölçeği-Kısa Formu aracılığıyla toplanmıştır. Farklı travma türlerinin DZ üzerindeki yordayıcı etkisi hiyerarşik regresyon analizi ile test edilmiştir.

Bulgular: Çalışmada çocukluk çağı travma puanları (duygusal, fiziksel ve cinsel istismarın yanı sıra ihmal dahil) ile DZ puanları arasında anlamlı negatif ilişki tespit edilmiştir. Hiyerarşik regresyon analizi, çocukluk çağı travmalarının, özellikle duygusal ve cinsel istismarın, üniversite öğrencileri arasında daha düşük DZ puanlarını anlamlı olarak yordadığını göstermektedir.

Sonuç: Bu bulgular, çocukluk çağı travmalarının duygusal gelişim üzerindeki kalıcı etkisinin altını çizmekte ve yetişkinlikte duygusal zeka üzerindeki olumsuz etkileriyle başa çıkmada erken müdahale ve desteğin önemini vurgulamaktadır. Çalışma, çocukluk çağı travması öyküsü olan üniversite öğrencileri arasında duygusal yeterlilikleri artırmak için hedefe yönelik müdahalelere duyulan ihtiyacı vurgulamaktadır.

Anahtar Kelimeler: Çocukluk çağı travmaları, duygusal zeka, üniversite öğrencileri, yordayıcılık

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Introduction

Childhood trauma refers to experiences of severe harm or threat during early developmental stages. These traumatic experiences may involve physical, emotional, and sexual abuse, as well as neglect and family dysfunction, such as domestic violence, substance abuse by a family member, or parental separation.[1] Early exposure to such traumatic events can hinder a child's growth and lead to lasting negative impacts.[2] Thus, it is essential to understand its profound and widespread effects on an individual's psychological, emotional, and physical health across their lifespan. Research has consistently shown that childhood trauma can result in numerous adverse outcomes in adulthood, particularly mental health conditions such as depression, anxiety, and post-traumatic stress disorder.[3-5] For example, a study by Widom et al.[6] discovered that individuals who experienced childhood abuse and neglect had a higher likelihood of developing major depressive disorder and anxiety disorders later in adulthood. Additionally, childhood trauma has been linked to physical health problems, substance abuse, and difficulties in forming and maintaining healthy interpersonal relationships.[7-9]

Emotional intelligence (EI) is the ability to perceive, understand, and manage one's own emotions and those of others.[10] EI is considered crucial for personal and professional success because it influences how individuals handle stress, interact with others, and make decisions. Salovey and Mayer[10] initially conceptualized EI as the ability to monitor both one's own emotions and those of others, to differentiate between them, and to utilize this knowledge to guide thoughts and actions. Building upon this foundation, Goleman[11] characterized EI as the aptitude to identify one's own emotions as well as the emotions of others, to motivate oneself, and to manage emotions effectively in interpersonal interactions. Likewise, Bar-On[12] viewed EI as a blend of interconnected emotional and social abilities, skills, and facilitators that influence how we perceive and express ourselves, interact with others, and handle everyday challenges. Previous research suggested that high levels of EI are related to a variety of positive outcomes, including better mental health, stronger interpersonal relationships, and improved academic and work performance.[13-15] Individuals with high EI are better prepared to manage stress and more inclined to use proactive and adaptive coping strategies.[16,17] The significance of EI is highlighted by its strong connections to a range of positive outcomes, such as academic success,[18,19] job performance,[20] mental health,[21] relationship satisfaction,[22] leadership effectiveness,[23,24] life satisfaction,[25,26] well-being[27-29] and overall psychological adjustment.[30,31]

Research suggests that childhood traumas can impair the development of emotional competencies, potentially leading to lower levels of EI. For instance, a study by Zhang et al.[32] found that childhood trauma was positively associated with general distress among adolescents, with social support and family functioning serving as important mediating factors in this relationship. Another study in young men, exploring the relationship between childhood emotional abuse and the processing of emotional facial expressions, found that higher reported levels of childhood emotional abuse were associated with impaired emotional processing, particularly the recognition of negative facial expressions.[33] Similarly, a study by Rüfenacht et al.[34] found that individuals with a history of childhood maltreatment, particularly emotional abuse, exhibited significant difficulties in managing their emotions, which was marked by increased emotional reactivity and the reliance on maladaptive cognitive emotion regulation strategies. These findings underscore the profound and lasting impact of early maltreatment on emotional functioning in adulthood. The investigation of EI in the context of childhood trauma is particularly valuable, as EI serves as a protective factor that can mitigate the adverse psychological outcomes associated with early maltreatment. Individuals with higher EI are better equipped to regulate emotions, navigate social situations, and employ adaptive coping strategies, potentially buffering the negative impact of trauma on mental health.[10-12] Conversely, deficits in EI may increase trauma-related difficulties, leading to heightened vulnerability to stress, emotional dysregulation, and interpersonal problems.[32,34] As university students face increasing emotional demands and developmental pressures, enhancing EI could serve as a crucial component in trauma-informed support systems designed to promote overall well-being.[10-12]

Given the substantial impact of EI on university students' academic success, career development, and overall well-being,[18,19] this study aims to investigate how different types of childhood trauma—emotional, physical, and sexual abuse—predict EI within this population. University students in a transitional life stage face unique emotional and social challenges, making the development of emotional competencies particularly crucial. While previous research has linked childhood trauma to a variety of psychological outcomes, the specific influence of these traumatic experiences on EI remains underexplored, especially among university students.

Despite growing evidence that childhood trauma negatively affects emotional functioning, it remains unclear how specific types of trauma—such as emotional, physical, and sexual abuse—predict EI in university students. This study addresses a critical gap by examining these distinct relationships, aiming to inform interventions that support the emotional development of students during this formative life stage.

Materials and Methods

Research Design

This study employed the relational survey model, a type of general survey design that explores the co-variation between two or more variables and determines the direction of any observed relationships.[35]

Study Sample

A power analysis was conducted to determine the required sample size. Using G*Power 3.1.9.7 software, an a priori power

analysis indicated that a sample size of 107 would be sufficient for a medium effect size (f^2=0.15; α=0.05; power=0.95). The study sample comprised 330 university students. Among the participants, 182 (55.2%) were female, and 148 (44.8%) were male. The age range of the participants was 18 to 44 years, with a mean age of 20.85 years. The sample was selected from different departments by convenience sampling method.

The Childhood Trauma Questionnaire-Short Form (CTQ-SF)

The CTQ-SF developed by Bernstein et al.,[36] is a retrospective assessment tool designed to review past abuse experiences during childhood. It was adapted into Turkish by Şar et al.[37] Both the original and Turkish versions of the CTQ-SF consist of 28 items. The CTQ-SF is a 5-point Likert scale instrument comprising 28 items organized into 5 subscales: emotional abuse, physical abuse, sexual abuse, emotional neglect, and physical neglect. Responses range from strongly disagree (1), disagree (2), somewhat agree (3), agree (4), to strongly agree (5). A sample item illustrating the instrument's scope is: "I had to wear torn, ripped, or dirty clothes." Cronbach's alpha coefficients for internal consistency were 0.81 for emotional abuse (items: 3, 8, 14, 18, and 25), 0.79 for physical abuse (items: 9, 11, 12, 15, and 17), 0.80 for sexual abuse (items: 20, 21, 23, 24, and 27), 0.81 for emotional neglect (items: 5, 7, 13, 19, and 28), and 0.62 for physical neglect (items: 1, 2, 4, 6, and 26). The Cronbach's alpha for internal consistency measured in this study was 0.81.

Trait Emotional Intelligence Questionnaire-Short Form (TEIQue-SF)

TEIQue-SF was originally developed by Petrides and Furnham[38] and adapted into Turkish culture by Deniz et al.,[39] is designed to assess global trait EI. The TEIQue-SF consists of 30 items, selected from the full form of the TEIQue, and utilizes a 7-point Likert scale ranging from completely disagree (1) to completely agree (7). However, the Turkish form of TEIQue-SF consisted of 20 items because 10 were eliminated after they were found to load on multiple factors. The subscales of the instrument include Emotionality (items: 5, 11, 15, and 19), sociability (items: 3, 7, 8, and 17), well-being (items: 6, 13, 16, and 18), and self-control (items: 2, 4, 10, and 14). A sample item illustrating the instrument's scope is "I have the ability to influence other people's emotions in some way''. The Cronbach's alpha reliability coefficient for the entire scale is 0.81, and the test-retest reliability coefficient is 0.86. In this study, Cronbach's alpha for internal consistency was 0.82.

Statistical Analysis

Data were collected face-to-face from the participants between July 20, 2024 and October 5, 2024. The data collection process adhered to principles of voluntariness and confidentiality, ensuring participants could withdraw from the study at any time. All participants provided informed consent, and the study was conducted in line with the Declaration of Helsinki. Approval for the study was granted by the Social and Human Sciences Ethics Committee of Sakarya University (approval no: 11, date: 18.07.2024). SPSS 25 software was used for data analysis. Prior to analysis, the normality of the data was assessed, revealing that the dependent variable was normally distributed, with Kurtosis and Skewness values ranging from 0.027 to 2.30. The values obtained indicate that the data were normally distributed.[40] Subsequently, assumptions for multiple regression analysis were examined. Specifically, tests were conducted to assess multicollinearity among the predictor variables. Multicollinearity among variables was assessed using variance inflation factors (VIF) and condition indices (CI), with VIF values ranging from 1.001 to 2.279 (VIF<10), tolerance values from 0.439 to 0.999 (tolerance value >0.10), and CI values from 1 to 28 (CI<30), indicating no multicollinearity issues.[41] Autocorrelation was tested using the Durbin-Watson analysis, yielding a value of dw=1.858, which indicates no autocorrelation because it falls within the range of 1.5 to 2.5.[42] The assumption of homogeneity of variance-covariance matrices was tested using Box's M test, yielding p=0.271 (>0.05), indicating that the assumption was met.[41] Following confirmation that the assumptions for multiple regression analysis were met, hierarchical regression analysis was conducted. Within the hierarchical regression model, explanatory variables are introduced into the analysis in a sequence determined by the researcher. The variance explained by each variable in relation to the dependent variable was assessed independently. In this analytical approach, the explanatory variables included earlier in the model function as control variables for those added subsequently.[43]

Results

Descriptive statistics for the variables, including mean, standard deviation (SD), Skewness and Kurtosis, are presented in Table 1.

Table 1 provides descriptive statistics for key study variables, offering insights into the distribution and variability of dimensions of EI and experiences of childhood trauma in the sample of university students. Mean scores indicate that participants scored moderately high on EI dimensions, with the EI total score averaging 93.97 (SD=14.22). Childhood trauma scores varied across subtypes, with childhood physical abuse averaging 0.31 (SD=0.48) and childhood emotional neglect averaging 8.21 (SD=5.11). Skewness and Kurtosis values for all variables fell within acceptable ranges (±2), indicating no severe deviations from normality and supporting the use of parametric analyses.[40]

Table 1. Descriptive statistics

	n	$\bar{X}$	SD	Skewness	Kurtosis
EITS	330	93.97	14.22	0.52	0.03
CPA	330	0.31	0.48	1.44	1.74
CEA	330	1.38	1.32	0.65	-0.15
CSA	330	0.27	0.45	1.58	2.30
CPN	330	3.46	3.48	0.60	-1.23
CEN	330	8.21	5.11	0.89	-0.92

EITS: Emotional intelligence total score, CPA: Childhood physical abuse, CEA: Childhood emotional abuse, CSA: Childhood sexual abuse, CPN: Childhood physical neglect, CEN: Childhood emotional neglect, SD: Standard deviation

Before proceeding with hierarchical regression analysis, an examination of the relationships between variables was conducted, and the results are presented in Table 2.

According to Table 2, the total score of EI is negatively correlated with childhood trauma experiences (r=-0.48, p<0.01) and with its subscales: physical abuse (r=-0.36, p<0.01), emotional abuse (r=-0.40, p<0.01), sexual abuse (r=-0.38, p<0.01), physical neglect (r=-0.49, p<0.01), and emotional neglect (r=-0.52, p<0.01). Results of the hierarchical regression analysis predicting EI from age, gender, and childhood trauma experiences (abuse and neglect subscales) are presented in Table 3.

As seen in Table 3, the hierarchical regression analysis was conducted in three steps. In the first block, age and gender were included in the analysis. In the second block, the sub-dimensions of childhood trauma related to abuse, namely physical, emotional, and sexual abuse, were included in the analysis. In the third block, the sub-dimensions of childhood trauma related to neglect were included in the analysis.

When age and gender were entered in the first block, they did not significantly predict EI [F(2, 327)=0.44; p>0.05; R=0.05; R^2=0.00; ΔR^2=0.00].

In the second block, the sub-dimensions of childhood trauma related to physical, emotional, and sexual abuse were found to be significant predictors of EI [F(5, 324)=20.38; p<0.000, R=0.49; R^2=0.24; ΔR^2=0.24]. These sub-dimensions of childhood trauma explained 24% of the variance in EI. According to standardized regression coefficients, the order of effect sizes of the abuse sub-dimensions on EI was as follows: emotional abuse, sexual abuse, and physical abuse.

In the third block, the sub-dimensions of childhood trauma—physical and emotional neglect—significantly predicted EI [F(7, 322)=21.03; p<0.000, R=0.56; R^2=0.31; ΔR^2=0.07]. The childhood trauma sub-dimensions of physical and emotional neglect explained 7% of the variance in EI. According to standardized regression coefficients, the order of effect sizes of the neglect sub-dimensions on EI was as follows: emotional neglect, followed by physical neglect.

Table 2. The correlational analysis between study variables

	EITS	CPA	CEA	CSA	CPN	CEN
EITS	1					
CPA	-0.36**	1				
CEA	-0.40**	0.44**	1			
CSA	-0.38**	0.49**	0.35**	1		
CPN	-0.49**	0.56**	0.43**	0.66**	1	
CEN	-0.52**	0.60**	0.43**	0.68**	0.88**	1

**p<0.01, EITS: Emotional intelligence total score, CPA: Childhood physical abuse, CEA: Childhood emotional abuse, CSA: Childhood sexual abuse, CPN: Childhood physical neglect, CEN: Childhood emotional neglect

Table 3. Hierarchical regression analysis on the prediction of emotional intelligence by age, gender, and sub-dimensions of childhood trauma, abuse, and neglect

Variable	B	SD	β	t	p	Dual R	Partial R
Constant	90.32	5.47		16.50	0.000		
Age	0.21	0.24	0.05	0.88	0.378	0.05	0.05
Gender (male)	-0.56	1.58	-0.02	-0.36	0.722	-0.02	-0.02
1st block: R=0.05; R^2=0.00; ΔR^2=0.00; $F_{(2, 327)}$=0.44; p>0.65							
Constant	95.42	4.88		19.52	0.000		
Age	0.22	0.21	0.05	1.04	0.301	0.05	0.06
Gender	0.63	1.40	0.02	0.45	0.653	-0.02	0.03
CPA	-4.19	1.74	-0.14	-2.40	0.017	-0.36	-0.13
CEA	-2.70	0.59	-0.25	-4.56	0.000	-0.40	-0.25
CSA	-7.08	1.77	-0.23	-3.99	0.000	-0.38	-0.22
2nd block: R=0.49; R^2=0.24; ΔR^2=0.24; $F_{(5, 324)}$=20.38; p<0.000							
Constant	95.42	4.78		20.51	0.000		
Age	0.31	0.20	0.07	1.55	0.123	0.05	0.09
Gender	1.01	1.35	0.04	0.75	0.455	-0.02	0.04
CPA	-0.55	1.77	-0.02	-0.31	0.757	-0.36	-0.02
CEA	-2.09	0.575	-0.19	-3.63	0.000	-0.40	-0.20
CSA	-0.63	2.02	-0.02	-0.31	0.757	-0.38	-0.02
CPN	-0.46	0.41	-0.11	-1.12	0.263	-0.49	-0.06
CEN	-0.89	0.29	-0.32	-3.08	0.002	-0.52	-0.17

3rd block: R=0.56; R^2=0.31; ΔR^2=0.07; $F_{(7, 322)}$=21.03; p<0.000. CPA: Childhood physical abuse, CEA: Childhood emotional abuse, CSA: Childhood sexual abuse, CPN: Childhood physical neglect, CEN: Childhood emotional neglect, SD: Standard deviation

With the inclusion of the sub-dimensions of neglect in the third stage, the total explained variance in EI increased to 31%.

These findings suggest that experiences of childhood trauma, particularly emotional and sexual abuse, are associated with significantly lower EI in adulthood, highlighting the enduring impact of early life adversities on psychological outcomes.

Discussion

This study underscores the significant influence of childhood trauma on EI among university students. Findings indicate that experiences of childhood abuse and neglect—particularly emotional abuse, sexual abuse, and emotional neglect—strongly predict lower EI levels. Additionally, the study found that demographic factors such as age and gender did not significantly predict EI, suggesting that experiential factors related to childhood trauma play a more critical role in predicting EI. These results align with previous research highlighting the detrimental effects of early traumatic experiences on emotional and psychological development.[29,33,44-46]

The negative correlation between childhood trauma and EI, found in this study, is consistent with the existing literature. Childhood trauma, including physical, emotional, and sexual abuse and neglect, disrupts the normal development of emotional competencies. This disruption can result in difficulties in recognizing, understanding, and managing emotions, both in oneself and in interactions with others.[33,34] The current findings extend this body of knowledge by demonstrating that childhood trauma significantly predicts EI in a sample of university students, a population for whom emotional competencies are crucial for academic and social success.

Emotional abuse emerged as a significant predictor of lower EI, aligning with existing research that underscores the profound influence of emotional maltreatment on emotional functioning. For instance, Liu et al.[33] found that emotional abuse during childhood is associated with impaired emotional processing and increased emotional reactivity in adulthood. Similarly, Rüfenacht et al.[34] highlighted that individuals with a history of emotional abuse struggle with emotion regulation, often resorting to maladaptive coping strategies. These findings suggest that the internalized negative messages associated with emotional abuse may hinder the development of adaptive emotion-regulation strategies and impair interpersonal relationships, thereby diminishing EI among affected individuals.

Sexual abuse was also a significant predictor of lower EI. This is in line with research by Copeland et al.,[47] which demonstrated that individuals exposed to sexual abuse in childhood are more likely to experience psychiatric disorders and social difficulties in adulthood. The trauma of sexual abuse can severely disrupt emotional development,[48] leading which are key components of EI.

Furthermore, emotional neglect significantly predicted lower EI, emphasizing the importance of nurturing emotional environments for healthy emotional development. Emotional neglect, characterized by a lack of emotional support and attention, can lead to difficulties in understanding and expressing emotions, as well as problems in interpersonal relationships.[49] This finding aligns with the works of Lo et al.[50] and Zhang et al.,[32] who found that emotional neglect negatively impacts emotional well-being and social functioning.

Our finding that age and gender did not significantly predict EI in this study contributes to a nuanced understanding of the factors influencing EI. Recent research has shown mixed results regarding the impact of these demographic variables on EI. For instance, a study by Öztimurlenk[51] found that while some aspects of EI may improve with age, the overall relationship between age and EI was not significant, suggesting that other factors play a more critical role. Furthermore, a recent study by Sergi et al.[52] confirmed that while gender differences in EI exist, they are not consistent across all contexts and populations, indicating that situational factors may be more influential than demographic characteristics. Additionally, research by Almajali et al.[53] found no significant differences in EI based on age or gender among adolescents, highlighting the complexity of these relationships. Collectively, these findings suggest that situational factors may play a more critical role than do demographic characteristics alone.

Understanding the predictive role of childhood trauma on EI has important implications for interventions aimed at addressing the adverse effects of early traumatic experiences. Interventions should focus on enhancing emotional competencies and providing support for individuals with a history of childhood trauma. One prominent example is trauma-informed therapy, which acknowledges the pervasive effects of trauma on individuals' lives. This approach prioritizes a safe therapeutic environment—physically, psychologically, and emotionally—to help clients regain a sense of empowerment and control by addressing trauma-related symptoms and equipping individuals with skills essential for resilience and long-term healing.[54]

Programs that promote emotional awareness, regulation, and social skills can help improve EI and, consequently, overall well-being and success in university students. Interventions also involve connecting individuals with supportive networks, including therapists, counselors, support groups, and community resources. These networks can provide ongoing support, validation, and encouragement, which are essential for healing from childhood trauma and developing EI.

Study Limitations

While this study provides valuable insights, it has several limitations. The use of self-report measures may introduce bias, and the cross-sectional design limits the ability to draw causal inferences. Future research should employ longitudinal designs to better understand the temporal relationship between childhood trauma and EI. Additionally, exploring the mechanisms through which different types of trauma impact EI can provide a deeper understanding of these relationships. The sample consisted solely of university students, which may limit the generalizability of the findings to non-students or individuals from different educational or cultural contexts. Variations in

emotional competencies across different demographic groups may not be captured in this study.

Conclusion

This study highlights the significant impact of childhood trauma on the EI of university students. The findings underscore the need for targeted interventions to support individuals with a history of trauma, promoting emotional competencies that are essential for overall well-being. By addressing the lasting effects of childhood trauma, we can better support the emotional and psychological development of university students, aiding their transition into adulthood.

Ethics

Ethics Committee Approval: Approval for the study was granted by the Social and Human Sciences Ethics Committee of Sakarya University (approval no: 11, date: 18.07.2024).

Informed Consent: All participants provided informed consent, and the study was conducted in line with the Declaration of Helsinki.

Footnotes

Authorship Contributions

Concept: İ.T., E.G.T., Design: İ.T., Data Collection or Processing: İ.T., E.G.T., Analysis or Interpretation: İ.T., Literature Search: E.G.T., Writing: İ.T., E.G.T.

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Aile Duyguları Envanterinin Türkçe Uyarlamasının Geçerlik ve Güvenirliğinin İncelenmesi

Investigating the Reliability and Validity of the Turkish Version of the Inventory of Family Feelings

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ÖZ

Amaç: Aile Duyguları Envanteri (ADE), sadece belirli aile üyelerine karşı değil, farklı yakınlık düzeylerindeki pek çok aile üyesine karşı duygusal yakınlığın değerlendirilmesinde kullanılan bir ölçme aracıdır. Bu çalışmanın temel amacı, ADE'nin Türkçe adaptasyonunun geçerlik ve güvenirliğini incelemektir.

Gereç ve Yöntem: Araştırma kapsamında, 394 üniversite öğrencisi, annelerine ve babalarına yönelik duygusal yakınlıklarını online bir form aracılığıyla ayrı ayrı değerlendirmiştir. Ölçeğin, ölçüt geçerliğini incelemek için Yakın İlişkilerde Yaşantılar Envanteri-II ve Beck Depresyon Envanteri kullanılmıştır.

Bulgular: Elde edilen bulgular, bireyin diğer aile üyesine yönelik öznel duygularına (Öznel Duygular Ölçeği) ve diğer aile üyesinden kendisine yönelik algıladığı duygusal yakınlığa (Algılanan Duygular Ölçeği) işaret eden ADE maddelerinin iki ayrı faktöre yüklendiğini göstermiştir. Ölçeğin toplam puanı ve faktörlerine dair gerçekleştirilen analizler, ölçeğin geçerlik ve güvenilirliğinin oldukça yüksek olduğuna işaret etmiştir. Yapı geçerliğine yönelik incelemeler, alan yazınla tutarlı şekilde ölçekten elde edilen puanların, romantik bağlanma kaygısı, kaçınması ve depresif belirti şiddeti ile negatif yönde anlamlı ilişkiler gösterdiğini ortaya koymuştur. Son olarak, anneye yönelik ADE puanlarının, babaya yönelik olandan anlamlı olarak daha yüksek olduğu gözlenmiştir.

Sonuç: Elde edilen bulgular, ölçeğin gelecekteki kullanımının iyileştirilmesi, duygusal deneyimlerin kültürler arası farklılaşmasına ek olarak, anne ve babaya yönelik duyguların farklılığı açısından tartışılmıştır.

Anahtar Kelimeler: Aile Duyguları Envanteri, romantik bağlanma, depresif belirti, geçerlik, güvenirlik

ABSTRACT

Objectives: The Inventory of Family Feelings (IFF) serves as a measure for gauging emotional proximity, not solely to specific family members, but also to family members across various levels of intimacy. The principal aim of this study is to investigate the validity and reliability of the Turkish adaptation of the IFF.

Materials and Methods: Within the context of this research, 394 university students engaged in evaluating their feelings toward their mothers and fathers separately, utilizing an online questionnaire. To ascertain the scale's criterion validity, the Experiences in Close Relationships Inventory-II and the Beck Depression Inventory were employed.

Results: The results revealed a two-factor solution of the IFF scale, reflecting an individual's subjective sentiments directed at other family members (Subjective Feelings Scale) and the perceived emotional proximity from other family members (Perceived Feelings Scale), each loading onto different factors. Analyses of both the total scores and the subscales of the IFF underscored the scale's robust validity and reliability. Further exploration of criterion validity demonstrated consistent results with existing literature, revealing negative correlations between the

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ABSTRACT

IFF scores and romantic attachment anxiety, avoidance, and the severity of depressive symptoms. Notably, the IFF scores for mothers were significantly higher than those for fathers.

Conclusion: These findings are discussed in terms of enhancing future applications of the scale, delving into cross-cultural disparities in emotional experiences, and elucidating distinctions in emotions towards mothers and fathers.

Keywords: Inventory of Family Feelings, romantic attachment, depressive symptoms, validity, reliability

Giriş

Hayatımızdaki anlamlı kişilerle kurulan olumlu ilişkiler; stresle başa çıkma, duygusal dengeyi koruma ve dünyamızı daha güvenli ve daha az kaygılı bir şekilde keşfetme kapasitemizi destekleyebilir.[1] Aile içi ilişkilerin ve bu ilişkileri çevreleyen duyguların, bireyin psikolojik iyi oluşu ve gelişimsel sonuçları üzerindeki rolünü anlamaya yönelik çok sayıda araştırma bulunmaktadır.[2-4] Devam etmekte olan bu incelemeler, temel bakım verene bağlanma,[1,5,6] ebeveynler arası ilişki örüntüleri[7] ile aile bütünlüğü ve uyumluluğuna[8] ek olarak, ailenin duygusal yapısı veya duygusal ikliminin[9] aile işleyişinin önemli yönleri olduğunu vurgulamaktadır. Ailenin duygusal yapısı; üyeler arasındaki iletişimin kalitesi, çatışmaların düzeyi ve bireylerin birbirlerine sağladıkları duygusal ve araçsal desteğin (örneğin; ekonomik yardım) kapsamı gibi çeşitli faktörlerin bir yansımasıdır. Kuşaklar arası ilişkiler, araçsal destek ve şefkat sağlamak için benzersiz olsa da kardeşler, kayınvalide-kayınpederler ve diğer akrabalar da hem duygusal hem de araçsal destek sağlayarak bireylerin hayatlarında önemli olabilmektedir. Dolayısıyla, daha geniş aile bağlamı ve bunun bireyler üzerindeki etkisinin daha kapsamlı bir şekilde anlaşılabilmesi için sadece ebeveyn-çocuk ilişkileri değil, diğer aile üyeleriyle olan ilişkilerin de incelenmesi önemlidir. Ancak aile içi ilişkilerin değerlendirilmesi amacıyla geliştirilen ölçme araçlarının neredeyse tamamı spesifik olarak ebeveyn-çocuk ilişkilerinin incelenmesini hedeflemektedir ve farklı aile üyeleri arasındaki ilişkilerin incelenmesi amacıyla kullanılabilecek ölçme araçlarına ihtiyaç duyulmaktadır. Bu doğrultuda bu araştırma, herhangi bir spesifik yakınlık bağı sınırlaması olmaksızın tüm aile üyeleri arasındaki duygusal yakınlığın incelenmesine izin veren Aile Duyguları Envanterinin (ADE) Türkçe uyarlamasının psikometrik özelliklerinin incelenmesini amaçlamaktadır.

ADE, aile üyelerinin birbirlerine karşı hissettiği olumlu duyguların gücünü veya yakınlık düzeyini değerlendirmede kullanılan bir ölçme aracıdır. Ölçek, yalnızca ebeveyn ya da partner gibi belirli ilişki partnerlerine değil, diğer aile üyelerine yönelik duyguların değerlendirilmesine de olanak tanımaktadır. Bu esnek kullanımından dolayı, birlikteliği devam eden ya da ayrılmış partnerler, üvey ebeveynler ve çocukları, ceza infaz kurumlarındaki ebeveynler ve dışarıdaki çocuklarının temel bakım verenleri arasındaki ilişkilerin duygusal yakınlığına odaklanan çalışmalarda kullanılmıştır.[3,10-14] Tüm bu çalışmalar, ADE'nin güvenirlik ve geçerliğinin yüksek olduğuna işaret etmektedir. Ölçek neredeyse tüm görgül araştırmalarda tek faktörlü yapıda kullanılmaktadır.[3,12] Ancak ölçeğin orijinal geliştirilme makalesi kapsamında gerçekleştirilen faktör analizleri, ölçeğin iki faktörlü yapıda da kullanılabileceğini göstermektedir. Bu faktörlerden birincisi, bireyin diğer aile üyesine yönelik öznel duygularına işaret eden maddelerin yüklendiği Öznel Duygular Ölçeği (ÖDÖ) (*Subjective Feelings Scale*)'dir. Ölçeğin ikinci faktörü ise bireylerin diğer aile üyesinden kendilerine yönelik olarak algıladıkları duygusal yakınlığa odaklanan maddelerin yüklendiği Algılanan Duygular Ölçeği (ADÖ) (*Perceived Feelings Scale*)'dir. Ancak orijinal makalede, ölçeğin tek faktörlü yapıda kullanılmasının oldukça uygun olduğu belirtilmekte ve tek faktörlü kullanım önerilmektedir. Ölçeğin hem uluslararası[3,12] hem de ulusal[13] alan yazında kullanıldığı çalışmalarda da tek faktörlü yapı daha uygun bulunmuştur. Özetle, ölçeğin hem tek faktörlü hem de iki faktörlü yapıda kullanılabildiği ancak tek faktörlü yapıda kullanıldığı örnek araştırmaların daha yaygın olduğu gözlenmektedir.

Aile üyeleriyle kurulan olumlu ilişkiler, bireylerin pek çok stres faktörü ile mücadele ettiği erken yetişkinlik yıllarındaki psikolojik belirti şiddetleri[15] ve anlamlı romantik ilişkiler kurabilme becerileri[16] açısından oldukça kritik öneme sahiptir. Bununla tutarlı olarak, alan yazında gerçekleştirilen çalışmalar, ADE puanlarının bireylerin psikolojik iyiliği ve sosyal destek miktarı ve bu destekten tatmin olma düzeyleri ile pozitif[3,13] yönde ilişkiliyken psikolojik belirti şiddetleri[13] ile negatif yönde ilişkili olduğunu göstermiştir. Bu doğrultuda bireylerin psikolojik belirti şiddeti bu çalışmada ADE'nin ölçüt geçerliğinin değerlendirilmesi amacıyla kullanılmıştır. Psikolojik belirti şiddetine ek olarak, ADE'nin aile ilişkilerindeki duyguların değerlendirilmesi amacıyla kullanıldığı dikkate alındığında, ADE puanlarının bireylerin bağlanma puanlarıyla da ilişkili olabileceği düşünülmektedir. Yakın ilişkilerde güvenli bağlanma sergileyen bireylerin, bağlılık kurmayı destekleyen ilişki pratikleri benimsedikleri;[17,18] buna karşılık, güvensiz bağlanmış bireylerin ise partnerinin ihtiyaçlarına duyarlı olma ve gerektiğinde partnerini destekleme becerilerinin daha düşük olabileceği gözlenmektedir.[19] Bu doğrultuda, bu çalışmada bireylerin romantik ilişkilerdeki bağlanma temsilleri, ADE'nin ölçüt geçerliğinin belirlenmesi amacıyla kullanılan bir diğer değişkendir.

Araştırmanın Temel Amacı ve Hipotezleri

Bu araştırma, ADE'nin Türkçe uyarlamasının psikometrik özelliklerini incelemeyi amaçlamaktadır. Araştırma kapsamında, üniversite öğrencileri annelerine ve babalarına yönelik duygularını ayrı ayrı değerlendirmiştir. Bu kapsamda ilk olarak, ADE'nin Türkçe versiyonunun hem anne hem de babalar için yanıtlanan formlarının faktör yapılarının incelenmesi hedeflenmiştir. Ölçeğin güvenirlik düzeyinin değerlendirilmesi için madde-toplam test korelasyonları, Cronbach alfa iç tutarlık

katsayıları ve Guttman iki yarım güvenirliklerinin hesaplanması planlanmaktadır. Son olarak, ölçeğin ölçüt geçerliğinin incelenmesi için kaygılı ve kaçınmacı romantik bağlanma ve depresif belirti puanları ile arasındaki korelasyonların hesaplanması amaçlanmaktadır. Bu amaçlar doğrultusunda, ADE'nin orijinalinde olduğu gibi iki faktörlü bir yapıda (öznel ve algılanan duygular) gözlenmesi beklenmektedir (H1). İkinci olarak, ölçeğin madde-toplam korelasyonları, Cronbach alfa ve Guttman güvenirlik katsayılarının kabul edilebilir düzeyde olması öngörülmektedir (H2). Üçüncü olarak, ADE puanlarının romantik ilişkilerdeki kaygılı ve kaçınmacı bağlanma puanları ve depresyon belirtisi düzeyleriyle negatif yönde anlamlı ilişkiler göstermesi beklenmektedir (H3). Son olarak, yetişkin bireylerin kendilerini annelerine, babalarından daha yakın hissettiklerini gösteren araştırma bulgularına[20] dayanarak, katılımcıların annelerine yönelik ADE puanlarının, babalarına yönelik puanlardan daha yüksek olacağı öngörülmektedir (H4).

Gereç ve Yöntem

Katılımcılar

Araştırma örneklemi, birinci (%31,9), ikinci (%32,1), üçüncü (%25,0) ve dördüncü (%11,0) sınıfa devam eden 394 üniversite öğrencisinden oluşmaktadır (%78,2 kadın). Yakın zamanda gerçekleştirilen ve nicel ölçek geliştirme çalışmalarına odaklanan bir sistematik incelemeye[21] göre genel popülasyon örneklemlerinde 375-500 arası katılımcı yaygın olarak kullanılmaktadır. Bu doğrultuda, 394 kişilik örneklemin, çalışmada gerçekleştirilen analizler için yeterli düzeyde temsiliyet ve güvenirlik sağladığı değerlendirilmektedir. Katılımcıların yaş ortalamaları 21,3'tür [standart sapma (sd)=1,7, ranj=17,9-29,7]. Çoğunluğu (%51,3) psikoloji okumaktayken dil ve konuşma terapisi (%14,0), beslenme ve diyetetik (%9,4) gibi diğer lisans programlarında eğitimine devam eden öğrenciler de katılımcılar arasında bulunmaktadır. Çoğunluğu (%95,2) biyolojik ebeveynleri tarafından büyütülmüştür ve ebeveynleri hala birliktedir (%87,0). Çoğunun bir (%43,4), iki (%26,8) veya üç (%10,2) kardeşi bulunmaktadır. Katılımcıların herhangi bir fiziksel, psikolojik ve biyolojik rahatsızlığı bulunmamaktadır. Araştırma verileri, Haziran 2021 ila Nisan 2022 tarihleri arasında Google Forms aracılığıyla çevrimiçi olarak toplanmıştır.

Ölçme Araçları

Demografik Bilgi Formu

Katılımcıların yaş, cinsiyet, eğitim durumu ve aile ile yaşama durumu gibi değişkenlere ilişkin bilgilerin toplandığı demografik bilgi formu, araştırmacılar tarafından oluşturulmuştur.

Aile Duyguları Envanteri

Katılımcıların ebeveynlerine yönelik duygularının değerlendirilmesi amacıyla ADE[9] kullanılmıştır. Katılımcılar, annelerine ve babalarına yönelik duygularını ayrı ayrı rapor etmiştir. Daha önce de belirtildiği gibi ADE aile üyeleri arasındaki kişiler arası duyguları değerlendirmek için geliştirilmiş olup çatışmalı ilişki ve ittifak örüntülerine işaret etmektedir. Ölçek 38 maddeden oluşmaktadır (örneğin; "Kendimi bu aile üyesine yakın hissediyorum.") ve ölçek maddelerinin 22'si ters kodlanmaktadır (örneğin; "Bu aile üyesi bana çok fazla ilgi göstermiyor."). Orijinal ölçekte maddeler 3'lü Likert tipi bir ölçek üzerinden derecelendirilmektedir (0=Katılmıyorum, 1=Kararsızım, 2=Katılıyorum). Bu çalışmada ölçek maddelerinin ölçüm hassasiyetini artırmak için hiç katılmıyorum ve tamamen katılıyorum arasında değişen 5'li Likert tipi bir derecelendirme kullanılmıştır. Ölçeğin toplam güvenirlik katsayısı 0,96 olarak hesaplanmıştır. Ölçekten alınan yüksek puanlar, değerlendirmeye konu olan aile üyesine karşı daha olumlu duygular beslendiğine işaret etmektedir. Lowman,[9] ölçeğin ÖDÖ (23 madde) ve ADÖ (15 madde) olmak üzere iki faktöre sahip olduğunu belirtmiş ancak iki faktöre ait sonuçlar neredeyse özdeş olduğu için analiz sonuçlarını sadece toplam duygu puanları üzerinden raporlamıştır. Buna paralel olarak, ölçme aracı alan yazında çoğunlukla tek faktörlü yapıda kullanılmaktadır.[3,14]

ADE, daha önce farklı bir çalışma kapsamında Türkçeye çevrilmiştir (anonim). Yazar, anketi İngilizceden Türkçeye çevirmiştir. Çevirinin ardından, İngilizce konusunda uzman olan ve anadili Türkçe olan iki akademisyen psikolog, çevrilen maddeleri orijinalleriyle karşılaştırmıştır. Bu ikinci adımdan sonra, İngilizce mütercim tercümanlık bölümünden bir öğretim üyesi, çevrilen maddeleri İngilizce orijinal maddelerle karşılaştırarak ikinci adımı tekrarlamıştır. Farklı alanlarda çalışan tüm bu uzmanların geri bildirimlerine dayanarak ADE'nin Türkçe versiyonuna son hali verilmiştir.

Yakın İlişkilerde Yaşantılar Envanteri-II (YİYE-II)

Katılımcıların romantik bağlanma temsilleri, YİYE-II kullanılarak ölçülmüştür.[22] Ölçek Selçuk ve ark.[23] tarafından Türkçeye çevrilmiştir. YİYE-II, 18'i romantik ilişkilerde kaygılı (örneğin; "Romantik ilişkide olduğum kişilerin beni, benim onları önemsediğim kadar önemsemeyeceklerinden endişe duyarım.") ve diğer 18'i kaçınmacı (örneğin; "Birlikte olduğum kişiler benimle çok yakınlaştığında gergin hissederim.") bağlanma değerlendiren toplam 36 maddeden oluşmaktadır. Ölçek maddelerinden 14'ü ters kodlanmaktadır (örneğin; "Özel duygu ve düşüncelerimi birlikte olduğum kişiyle paylaşmak konusunda kendimi rahat hissederim."). Maddeler, 1 (kesinlikle katılmıyorum) ile 7 (kesinlikle katılıyorum) arasında değişen Likert tipi bir ölçek kullanılarak değerlendirilmektedir. Faktör analizleri iki faktörlü bir çözümü doğrulamıştır. Kaygılı (α=0,87) ve kaçınmacı (α=0,90) bağlanma alt ölçeklerinin iç tutarlılık katsayıları kabul edilir sınırlar içindedir. Kaygılı ve kaçınmacı bağlanma boyutlarından alınan yüksek puanlar, sırasıyla kaygılı ve kaçınmacı bağlanma profillerine benzer özellikler sergilendiğine işaret etmektedir.

Beck Depresyon Envanteri

Katılımcıların depresif belirti şiddetini değerlendirmek için Beck Depresyon Envanteri (BDE) kullanılmıştır.[24] Ölçme aracı Hisli[25] tarafından Türkçe kullanım için uyarlanmıştır. Ölçek 21 maddeden oluşmaktadır ve ölçek maddeleri 0 (semptom yok) ile 3 (yoğun semptom) arasında değişen 4'lü Likert tipi bir ölçek üzerinden değerlendirilmektedir. Ölçek maddeleri duygusal durum, suçluluk duyguları, karamsarlık, başarısızlık, sosyal geri çekilme, kendinden

memnuniyetsizlik, intihar düşünceleri, ağlama ve öfkeli olma hali gibi psikolojik iyi oluş boyutlarına odaklanmaktadır. Faktör analizleri, ölçeğin tek faktörlü yapıda olduğuna işaret etmektedir ve ölçeğin iç tutarlık katsayısı (α=0,88) istenir sınırlar içindedir. Ölçekten elde edilen yüksek puanlar, depresif belirtilerin daha şiddetli olduğuna işaret etmektedir.

İşlem

Çalışmanın etik olarak uygulanabilir oluşu, Kapadokya Üniversitesi Etik Kurulu tarafından onaylanmıştır (karar no: 23.16, tarih: 16.11.2023). Anketin web sitesi bağlantısı sosyal medya aracılığıyla katılımcılarla paylaşılmış ve katılımcılardan araştırma bağlantısını diğer lisans öğrencilerine iletmeleri istenerek kartopu örnekleme yöntemi kullanılmıştır. Ayrıca, bazı üniversite hocaları çalışma linkini tüm sınıflarıyla paylaşmıştır. Çalışmanın ayrıntılı açıklamasını içeren bilgilendirilmiş onam, anketin ilk sayfasında sunulmuştur ve katılımcıların ankete erişim sağlayabilmeleri için çalışmaya gönüllü olarak katılmayı kabul ettiklerini belirtmeleri gerekmiştir.

Veri Temizleme ve Analiz Planı

İstatistiksel Analiz

Tüm istatistiksel analizler SPSS 21 ve JASP (Sürüm 0.17.1; JASP Team, 2023) ile gerçekleştirilmiştir. İlk olarak veri setinde rastgele işaretleme yapan katılımcılar olup olmadığı incelenmiş ve inceleme sonunda dört kişi veri setinden çıkarılmıştır. Analizler kalan 390 kişiyle yapılmıştır. Yapılan bütün analizlerde, ADE Anne ve Baba formları ayrı ayrı kullanılmıştır. ADE'nin Türkçe versiyonunun Lowman[9] tarafından önerilen iki faktörlü modele sahip olup olmadığını belirlemek için açımlayıcı faktör analizi (AFA) ve doğrulayıcı faktör analizi (DFA) yapılmıştır. Güvenirlik için ADE'nin ve faktörlerinin madde-toplam test korelasyonları, Cronbach alfaları ve Guttman iki yarım güvenirlikleri; ölçüt geçerliği için ADE'nin toplam puanı ve faktörlerinden elde edilen puanların, YİYE II'nin kaygılı ve kaçınmacı bağlanma boyutları ve BDE ile korelasyonları hesaplanmıştır. Son olarak katılımcıların annelerine yönelik bildirdikleri ADE puanlarının, babalarına yönelik bildirdikleri ADE puanlarından daha yüksek olup olmadığı, tekrarlı ölçüm t-testi ile incelenmiştir.

Bulgular

Açımlayıcı Faktör Analizi

AFA öncesinde örnekleme yeterliğini belirlemek için Keiser-Meyer-Olkin (KMO) testi ve maddelerin faktörlenebilir olup olmadığını belirlemek için Bartlett'ın küresellik testi, anne ve baba formları için ayrı ayrı gerçekleştirilmiştir. KMO değerleri (anne formu =0,95; baba formu =0,97) örneklemenin faktör analizi için oldukça uygun olduğuna işaret etmektedir.[26] Bartlett'ın küresellik testi[27] ise maddelerin ilişkili ve faktörlenebilir olduğunu göstermiştir, anne ve baba formları için sırasıyla, $c^2(703)=8576{,}203$, $p<0{,}001$; $c^2(703)=13442{,}004$, $p<0{,}001$. AFA, ölçeğin özgün versiyonu iki faktörlü olduğu için iki faktöre zorlanarak ve korelasyon matrisi temelinde temel eksenler analizi ve Promax rotasyonu kullanılarak gerçekleştirilmiştir. AFA için ortak varyans (*communality*) değeri kesme noktası 0,20,[28] faktör yükü kesme noktası ise 0,35 olarak belirlenmiştir. İlk olarak anne formu için AFA yapılmış, daha sonra baba formu anne formundan elde edilen sonuçlar temel alınarak analiz edilmiştir.

Anne Formu

Analiz sonucunda faktör yükü kesme noktasının altında kalan 6 madde (8., 10., 14., 27., 30. ve 33. maddeler), her iki faktöre de yüklenen 2 madde (4. ve 22. maddeler), yanlış faktöre yüklenen 2 madde (9. ve 13. maddeler) ve ortak varyans değeri 0,20'nin altına olan 1 madde (17. madde) olduğu görülmüş ve bu maddeler çıkarılarak analiz tekrar edilmiştir. İkinci AFA sonrasında maddelerin ortak varyans değerlerinin 0,26 ile 0,66 arasında, faktör yüklerinin ise 0,91 ile 0,41 arasında değiştiği bulunmuştur. Birinci faktör (ÖDÖ) varyansın %27,1'ini, ikinci faktör (ADÖ) ise varyansın %20,1'ini açıklamaktadır. Açıklanan toplam varyans ise %47,2'dir. Anne formu için AFA sonuçları Tablo 1'de sunulmuştur.

Baba Formu

Ölçeğin iki formu arasında tutarlılık olması amacıyla, anne formunda atılan maddeler baba formu için de analizlerden çıkarılmıştır. AFA sonucunda, maddelerin ortak varyans değerlerinin 0,38 ile 0,76 arasında, faktör yüklerinin ise 0,98 ile 0,41 arasında değiştiği gözlenmiştir. Birinci faktör (ÖDÖ) varyansın %38'ini, ikinci faktör (ADÖ) ise varyansın %23'ünü açıklamaktadır. Açıklanan toplam varyans ise %61'dir. AFA sonuçları Tablo 2'de sunulmuştur.

Doğrulayıcı Faktör Analizi

ADE'nin iki faktörlü yapısı ile tek faktörlü yapısının model uyumlarını ve iki yapının model uyumları arasında anlamlı bir farklılık olup olmadığını test etmek için maksimum olabilirlik yöntemi kullanılarak, anne ve baba formları için ayrı DFA'lar yürütülmüştür. Modellerin uyum iyiliğinin incelenmesinde kullanılan kesme değerleri: $c^2/sd \leq 3$; karşılaştırmalı uyum indeksi (CFI)≥0,90; Tucker-Lewis indeksi (TLI)≥0,90; yaklaşık hataların ortalama karekökü (RMSEA)≤0,08 ve standartlaştırılmış ortalama hata kareleri karekökü (SRMR)≤0,08.[29,30] Ayrıca, model iyileştirme girişimlerinin anlamlı ölçüde daha iyi bir uyum sağlayıp sağlamadığını belirlemek için χ^2 fark testleri yapılmıştır.

Anne Formu

İlk olarak iki faktörlü yapının model uyumu test edilmiştir. DFA sonucunda bütün maddelerin kendi faktörlerine anlamlı olarak yüklendiği görülmüştür. Model uyumunu güçlendirmek için modifikasyon indeksleri incelenmiş ve en yüksek modifikasyon indeksine sahip olan ve aynı faktör altındaki 2. ve 5., 23. ve 24. ile 3. ve 20. maddelerin hataları ilişkilendirilmiştir. Her ilişkilendirme sonrası c^2 fark testi yapılmış ve ilişkilendirmeler sonucunda modelin anlamlı olarak daha uyumlu hale geldiği görülmüştür. Üç hata ilişkilendirmesi sonucunda elde edilen uyum indeksleri, $c^2(320)=815{,}14$, $p<0{,}001$, $c^2/sd=2{,}55$, uyum iyiliği indeksi (GFI)=0,99, CFI=0,92, TLI=0,91, RMSEA=0,06 ve SRMR=0,04 olarak bulunmuştur. Her analiz sonrasında elde edilen uyum indeksleri ve c^2 fark testi sonuçları Tablo 3'te sunulmuştur.

Tablo 1. ADE anne formunun AFA sonuçları, madde-toplam korelasyonları, ortalamaları, standart sapmaları ve Cronbach alfa değerleri

ADE maddeleri	Faktör yükleri			Madde-toplam korelasyonları	Ort.	SS
	1	2	h^2			
Faktör 1: Öznel Duygular Ölçeği						
3. Bu aile üyesini çok severim.	0,91		0,56	0,59	4,92	0,35
20. Bu kişiye çok değer veriyorum.	0,83		0,52	0,60	4,91	0,36
38. Bu kişiye oldukça düşkünümdür.	0,81		0,59	0,68	4,64	0,78
7. Bu aile üyesine kendimi çok yakın hissederim.	0,74		0,64	0,73	4,61	0,73
36. Bu aile üyesine karşı oldukça sıcak/samimi duygular beslerim.	0,73		0,47	0,60	4,75	0,64
1. Bu aile üyesine kendimi yakın hissediyorum.	0,68		0,58	0,70	4,76	0,59
16. Bu aile üyesine karşı genellikle olumlu şeyler hissederim.	0,59		0,48	0,65	4,71	0,68
26. Genellikle bu kişiye karşı çok cömertimdir.	0,58		0,31	0,50	4,63	0,70
5. Bu aile üyesinin yaptığı pek çok şeyi beğenirim.	0,58		0,50	0,67	4,43	0,77
2. Bu kişiye dair pek çok şeyi beğenirim.	0,57		0,55	0,71	4,46	0,71
25. Bu kişiyi her zamankinden daha az gördüğümde çok özlerim.	0,54		0,35	0,55	4,51	0,92
*34. Bu aile üyesine karşı genellikle soğuk hissederim.	0,53		0,66	0,79	4,59	0,83
*24. Bu aile üyesine dinlemekten keyif almıyorum.	0,49		0,39	0,62	4,43	1,02
*35. Bu kişiyle birlikte olduğum zamanlarda nadiren keyif alırım.	0,47		0,30	0,52	4,33	1,12
*29. Bu kişiye çok fazla saygı duymuyorum.	0,45		0,31	0,54	4,65	0,78
*18. Kendimi bu kişiye pek sadık hissetmiyorum.	0,45		0,40	0,62	4,54	0,92
*23. Bu kişiyle konuşmaktan keyif almıyorum.	0,40		0,26	0,50	4,36	1,13
Faktör 2: Algılanan Duygular Ölçeği						
*21. Bu aile üyesi bana önem verdiğini pek göstermez.		0,79	0,55	0,65	4,42	1,04
*31. Bu kişinin genellikle bana karşı bencilce davrandığını hissederim.		0,76	0,66	0,74	4,52	0,91
*6. Bu aile üyesi benimle çok fazla ilgilenmez.		0,73	0,40	0,53	4,36	1,05
*19. Bu kişinin onun için yaptığım şeyleri takdir etmediğini hissediyorum.		0,71	0,49	0,63	4,07	1,26
*15. Bazen bu aile üyesinin beni, istediği şeyi elde etmek için kullandığını hissederim.		0,69	0,48	0,62	4,55	0,90
*32. Bu kişinin yapabileceği halde bana yardım etmeye istekli olmadığını hissederim.		0,67	0,52	0,66	4,65	0,77
*12. Bu aile üyesi bana sevgi gösterirken zorlanır.		0,65	0,44	0,60	4,40	1,12
*28. Bu kişi bana karşı genellikle kibar değil.		0,62	0,43	0,60	4,35	1,00
*37. Bu kişi beni mutlu etmek için pek fazla bir şey yapmaz.		0,58	0,46	0,63	4,55	0,86
11. Bu aile üyesi bana karşı genellikle cömerttir.		0,41	0,48	0,66	4,76	0,61
Açıklanan varyans yüzdesi	27,1	20,1				
Cronbach alfa – Alt boyutlar	0,92	0,90				
Cronbach alfa – Toplam test	0,94					

*Ters kodlanmış maddeleri göstermektedir. Ort.: Ortalama, SS: Standart sapma, ADE: Aile Duyguları Envanteri, AFA: Açımlayıcı faktör analizi

Tablo 2. ADE baba formunun AFA sonuçları, madde-toplam korelasyonları, ortalamaları, standart sapmaları ve Cronbach alfa değerleri

ADE maddeleri		Faktör yükleri			Madde-toplam korelasyonları	Ort.	SS
		1	2	h^2			
Faktör 1: Öznel Duygular Ölçeği							
20. Bu kişiye çok değer veriyorum.		0,98		0,76	0,79	4,66	0,87
3. Bu aile üyesini çok severim.		0,97		0,73	0,77	4,68	0,85
38. Bu kişiye oldukça düşkünümdür.		0,84		0,74	0,82	4,21	1,19
1. Bu aile üyesine kendimi yakın hissediyorum.		0,79		0,76	0,84	4,22	1,06
2. Bu kişiye dair pek çok şeyi beğenirim.		0,78		0,69	0,80	3,92	1,12
16. Bu aile üyesine karşı genellikle olumlu şeyler hissederim.		0,78		0,76	0,84	4,37	1,04
7. Bu aile üyesine kendimi çok yakın hissederim.		0,78		0,72	0,82	4,02	1,18
36. Bu aile üyesine karşı oldukça sıcak/samimi duygular beslerim.		0,77		0,70	0,80	4,41	1,04
5. Bu aile üyesinin yaptığı pek çok şeyi beğenirim.		0,76		0,67	0,79	3,97	1,10
26. Genellikle bu kişiye karşı çok cömertimdir.		0,75		0,55	0,70	4,40	1,00
25. Bu kişiyi her zamankinden daha az gördüğümde çok özlerim.		0,72		0,58	0,73	4,13	1,20
*29. Bu kişiye çok fazla saygı duymuyorum.		0,60		0,51	0,69	4,47	1,01
*24. Bu aile üyesini dinlemekten keyif almıyorum.		0,60		0,51	0,70	4,11	1,29
*18. Kendimi bu kişiye pek sadık hissetmiyorum.		0,56		0,50	0,69	4,24	1,20
*34. Bu aile üyesine karşı genellikle soğuk hissederim.		0,55	0,35	0,73	0,85	4,01	1,36
*23. Bu kişiyle konuşmaktan keyif almıyorum.		0,49		0,45	0,66	4,02	1,34
*35. Bu kişiyle birlikte olduğum zamanlarda nadiren keyif alırım.		0,41		0,38	0,61	4,07	1,28
Faktör 2: Algılanan Duygular Ölçeği							
*21. Bu aile üyesi bana önem verdiğini pek göstermez.			0,88	0,69	0,73	4,04	1,32
*19. Bu kişinin onun için yaptığım şeyleri takdir etmediğini hissediyorum.			0,83	0,57	0,65	3,82	1,38
*12. Bu aile üyesi bana sevgi gösterirken zorlanır.			0,78	0,59	0,69	3,82	1,49
*37. Bu kişi beni mutlu etmek için pek fazla bir şey yapmaz.			0,76	0,62	0,72	4,24	1,16
*31. Bu kişinin genellikle bana karşı bencilce davrandığını hissederim.			0,70	0,70	0,79	4,15	1,26
*32. Bu kişinin yapabileceği halde bana yardım etmeye istekli olmadığını hissederim.			0,68	0,61	0,73	4,36	1,13
*15. Bazen bu aile üyesinin beni, istediği şeyi elde etmek için kullandığını hissederim.			0,59	0,34	0,52	4,45	1,04
*6. Bu aile üyesi benimle çok fazla ilgilenmez.			0,59	0,50	0,67	3,90	1,31
*28. Bu kişi bana karşı genellikle kibar değil.			0,56	0,54	0,71	3,95	1,26
11. Bu aile üyesi bana karşı genellikle cömerttir.			0,46	0,57	0,73	4,56	0,96
Açıklanan varyans yüzdesi		38,0	23,0				
Cronbach alfa	Alt boyutlar	0,96	0,93				
	Toplam test	0,97					

*Ters kodlanmış maddeleri göstermektedir. Ort.: Ortalama, SS: Standart sapma, ADE: Aile Duyguları Envanteri, AFA: Açımlayıcı faktör analizi

İkinci olarak tek faktörlü yapının model uyumu test edilmiştir. DFA sonucunda bütün maddelerin kendi faktörlerine anlamlı olarak yüklendiği görülmüştür. Model uyumunu güçlendirmek için modifikasyon indeksleri incelenmiş ve en yüksek modifikasyon indeksine sahip olan 3. ve 20., 2. ve 5. ile 23. ve 24. maddelerin hataları ilişkilendirilmiştir. Her ilişkilendirme sonrası ki-kare fark testi yapılmış ve ilişkilendirmeler sonucunda modelin anlamlı olarak daha uyumlu hale geldiği görülmüştür. Üç hata ilişkilendirmesi sonucunda elde edilen uyum indeksleri, $c^2(347)=1221,17$, $p<0,001$, $c^2/sd=3,52$, GFI=0,99, CFI=0,86, TLI=0,84, RMSEA=0,08 ve SRMR=0,06 olarak bulunmuştur. Her analiz sonrasında elde edilen uyum indeksleri ve χ^2 fark testi sonuçları Tablo 3'te sunulmuştur. DFA sonuçlarından görüldüğü gibi, ADE'nin anne formunun sadece iki faktörlü yapısı için elde edilen uyum indeksleri kabul edilebilirlik kriterlerini karşılamaktadır.

Baba Formu

İki faktörlü yapı için gerçekleştirilen DFA sonucunda bütün maddelerin kendi faktörlerine anlamlı olarak yüklendiği görülmüştür. Model uyumunu güçlendirmek için modifikasyon indeksleri incelenmiş ve en yüksek modifikasyon indeksine sahip olan ve aynı faktör altındaki 3. ve 20., 23. ve 24. ile 1. ve 7. maddelerin hataları ilişkilendirilmiştir. Her ilişkilendirme sonrası c^2 fark testi yapılmış ve ilişkilendirmeler sonucunda modelin anlamlı olarak daha uyumlu hale geldiği görülmüştür. Üç hata ilişkilendirmesi sonucunda elde edilen uyum indeksleri, $c^2(320)=960,664$, $p<0,001$, $c^2/sd=3,00$, GFI=0,96, CFI=0,93, TLI=0,92, RMSEA=0,07 ve SRMR=0,04 olarak bulunmuştur. Her analiz sonrasında elde edilen uyum indeksleri ve χ^2 fark testi sonuçları Tablo 4'te sunulmuştur.

İkinci olarak tek faktörlü yapının model uyumu test edilmiştir. DFA sonucunda bütün maddelerin kendi faktörlerine anlamlı olarak yüklendiği görülmüştür. Model uyumunu güçlendirmek için modifikasyon indeksleri incelenmiş ve en yüksek modifikasyon indeksine sahip olan 3. ve 20., 23. ve 24. ile 1. ve 7. maddelerin hataları ilişkilendirilmiştir. Her ilişkilendirme sonrası c^2 fark testi yapılmış ve ilişkilendirmeler sonucunda modelin anlamlı olarak daha uyumlu hale geldiği görülmüştür. Üç hata ilişkilendirmesi sonucunda elde edilen uyum indeksleri, $c^2(347)=1500,21$, $p<0,001$, $c^2/sd=4,32$, GFI=0,93, CFI=0,88, TLI=0,87, RMSEA=0,09 ve SRMR=0,05 olarak bulunmuştur. Her analiz sonrasında elde edilen uyum indeksleri ve c^2 fark testi sonuçları Tablo 4'te sunulmuştur. DFA sonuçları, anne formu bulgularıyla benzer şekilde, ADE'nin baba formunun da sadece iki faktörlü yapısı için elde edilen uyum indekslerinin kabul edilebilirlik kriterlerini karşıladığını göstermiştir.

ADE'nin Güvenirliği

ADE'nin güvenirliğini belirlemek için ilk olarak madde-toplam test korelasyonlarına ek olarak, ADE'nin toplam puanı ve alt faktörleri (ÖDÖ ve ADÖ) arasındaki korelasyonlar hesaplanmıştır. Anne formu için madde-toplam test korelasyonları 0,50 ile 0,79 arasında değişmektedir (Tablo 1). ADE ile ÖDÖ ve ADÖ arasındaki korelasyonlar ise sırasıyla 0,95 ve 0,91'dir. ÖDÖ ve ADÖ arasındaki korelasyon ise 0,73 olarak hesaplanmıştır. Baba formu içinse madde-test korelasyonları 0,52 ile 0,85 arasında değişmektedir (Tablo 2). ADE ile ÖDÖ ve ADÖ arasındaki korelasyonlar ise sırasıyla 0,97 ve 0,93'tür. ÖDÖ ve ADÖ arasındaki korelasyon ise 0,81 olarak hesaplanmıştır. İkinci olarak ADE, ÖDÖ ve ADÖ'nün Cronbach alfa katsayıları ve Guttman iki yarım güvenirlikleri hesaplanmıştır. Anne formu için Cronbach alfa katsayıları sırasıyla, 0,94, 0,92 ve 0,90; baba formu için ise sırasıyla, 0,97, 0,96 ve 0,93 olarak hesaplanmıştır. Anne formu için Guttman iki yarım güvenirlikleri sırasıyla, 0,95, 0,92 ve 0,90; baba formu içinse 0,97, 0,96 ve 0,93 olarak hesaplanmıştır.

Tablo 3. ADE anne formunun uyum indeksleri

Model	c^2	sd	c^2/sd	Δc^2	GFI	CFI	TLI	RMSEA	SRMR
Tek faktörlü model	1564,96*	350	4,47	-	0,99	0,80	0,79	0,09	0,06
Tek faktörlü model (1 hata ilişkilendirmesi)	1445,56*	349	4,14	119,4*	0,99	0,82	0,81	0,09	0,06
Tek faktörlü model (2 hata ilişkilendirmesi)	1331,73*	348	3,83	113,83*	0,99	0,84	0,83	0,08	0,06
Tek faktörlü model (3 hata ilişkilendirmesi)	1221,17*	347	3,52	110,56*	0,99	0,85	0,84	0,08	0,06
İki faktörlü model	1123,42*	323	3,48	-	0,99	0,86	0,85	0,08	0,05
İki faktörlü model (1 hata ilişkilendirmesi)	1015,48*	322	3,15	107,94*	0,99	0,88	0,87	0,07	0,05
İki faktörlü model (2 hata ilişkilendirmesi)	906,45*	321	2,82	109,03*	0,99	0,90	0,89	0,07	0,05
İki faktörlü model (3 hata ilişkilendirmesi)	815,14*	320	2,55	91,31*	0,99	0,92	0,91	0,06	0,04

*p<0,001. sd: Standart sapma, ADE: Aile Duyguları Envanteri, CFI: Karşılaştırmalı uyum indeksi, TLI: Tucker-Lewis indeksi, RMSEA: Yaklaşık hataların ortalama karekökü, SRMR: Standartlaştırılmış ortalama hata kareleri karekökü, GFI: Uyum iyiliği indeksi

ADE'nin Ölçüt Geçerliği

Ölçüt geçerliği için ADE'nin toplam puanı, alt faktörleri (ÖDÖ ve ADÖ) kaygılı, kaçınmacı bağlanma ve BDE ile ilişkisi anne ve baba formları için ayrı ayrı hesaplanmıştır. Tablo 5'te yer aldığı üzere anne formundaki ADE ile YİYE-II'nin kaçınmacı bağlanma alt boyutu ile ÖDÖ ile YİYE-II'nin kaçınmacı bağlanma alt boyutu arasındaki korelasyonlar dışındaki bütün korelasyonlar anlamlıdır.

Son olarak, katılımcıların annelerine yönelik bildirdikleri ADE puanlarının, babalarına yönelik bildirdikleri ADE puanlarından daha yüksek olup olmadığını belirlemek için tekrarlı ölçüm t-testi yapılmıştır. Analiz sonuçları hem ADE hem de alt faktörlerinin (ÖDÖ ve ADÖ) puanlarının anne formunda, baba formuna kıyasla anlamlı olarak daha yüksek olduğunu göstermiştir (Tablo 6).

Tablo 4. ADE baba formunun uyum indeksleri

Model	c^2	sd	c^2/sd	Δc^2	GFI	CFI	TLI	RMSEA	SRMR
Tek faktörlü model	2006,22*	350	5,73	-	0,92	0,83	0,82	0,11	0,06
Tek faktörlü model (1 hata ilişkilendirmesi)	1729,73*	349	4,96	276,49*	0,92	0,86	0,85	0,10	0,05
Tek faktörlü model (2 hata ilişkilendirmesi)	1605,70*	348	4,61	124,03*	0,93	0,87	0,86	0,10	0,05
Tek faktörlü model (3 hata ilişkilendirmesi)	1500,21*	347	4,32	105,49*	0,93	0,88	0,87	0,09	0,05
İki faktörlü model	1419,15*	323	4,39	-	0,95	0,88	0,87	0,09	0,04
İki faktörlü model (1 hata ilişkilendirmesi)	1161,10*	322	3,61	258,05*	0,95	0,91	0,90	0,08	0,04
İki faktörlü model (2 hata ilişkilendirmesi)	1041,54*	321	3,24	119,56*	0,96	0,92	0,92	0,08	0,04
İki faktörlü model (3 hata ilişkilendirmesi)	960,66*	320	3,00	80,88*	0,96	0,93	0,92	0,07	0,04

*p<0,001. sd: Standart sapma, ADE: Aile Duyguları Envanteri, CFI: Karşılaştırmalı uyum indeksi, TLI: Tucker-Lewis indeksi, RMSEA: Yaklaşık hataların ortalama karekökü, SRMR: Standartlaştırılmış ortalama hata kareleri karekökü, GFI: Uyum iyiliği indeksi

Tablo 5. Ölçekler arasındaki korelasyonlar

Değişken	Ort.	SS	1	2	3	4	5	6	7	8
1. Kaygılı bağlanma	3,24	1,08	—							
2. Kaçınmacı bağlanma	3,90	1,06	0,29***	—						
3. BDE	1,68	0,46	0,23***	0,46***	—					
4. ÖDÖ-anne	4,60	0,53	-0,05	-0,15**	-0,22***	—				
5. ADÖ-anne	4,46	0,70	-0,11*	-0,18***	-0,21***	0,73***	—			
6. ADE-anne	4,55	0,55	-0,08	-0,18***	-0,24***	0,95***	0,91***	—		
7. ÖDÖ-baba	4,23	0,90	-0,12*	-0,15**	-0,24***	0,47***	0,36***	0,45***	—	
8. ADÖ-baba	4,13	0,96	-0,13**	-0,22***	-0,25***	0,43***	0,58***	0,54***	0,81***	—
9. ADE-baba	4,19	0,88	-0,13**	-0,18***	-0,26***	0,48***	0,47***	0,51***	0,97***	0,93***

*p<0,05, **p<0,01, ***p<0,001, n=390. BDE: Beck Depresyon Envanteri, ÖDÖ: Öznel Duygular Ölçeği, ADÖ: Algılanan Duygular Ölçeği, Ort.: Ortalama, SS: Standart sapma, ADE: Aile Duyguları Envanteri

Tablo 6. Tekrarlı ölçüm t-testi sonuçları

	Anne formu		Baba formu		t(389)	p	Cohen d
	Ort.	SS	Ort.	SS			
ÖDÖ	4,60	0,53	4,23	0,90	9,17	<0,001	0,46
ADÖ	4,46	0,70	4,13	0,96	8,24	<0,001	0,42
ADE	4,55	0,55	4,19	0,88	9,20	<0,001	0,47

ÖDÖ: Öznel Duygular Ölçeği, ADÖ: Algılanan Duygular Ölçeği, Ort.: Ortalama, SS: Standart sapma, ADE: Aile Duyguları Envanteri

Tartışma

ADE, spesifik aile üyeleri (örneğin; ebeveyn ve çocuk) dışında, çeşitli aile üyelerinin (örneğin; mahkum ebeveyn ve çocuğuna bakmakta olan kardeşi) birbirlerine yönelik duygularının değerlendirilmesine izin veren bir ölçme aracıdır. Buna ek olarak, aynı anda birden fazla aile üyesine yönelik duyguların değerlendirilmesine uygun olması, bireysel puanların yanında genel aile iklimi skoru da vermesi gibi özellikleri sayesinde oldukça farklı değerlendirmeler yapılabilmesine imkan sağlamaktadır. Bu doğrultuda bu araştırmanın temel amacı, ADE'nin Türkçe geçerlik ve güvenirliğinin incelenmesidir. Araştırmada üniversite öğrencilerinin hem anneleri hem de babalarına yönelik ADE düzeyleri değerlendirilmiş ve ölçeğin anne ve baba formlarının geçerlik ve güvenirlik analizleri ayrı ayrı yürütülmüştür.

Ölçeğin yapı geçerliğinin incelenmesi için ilk olarak AFA ve ardından DFA gerçekleştirilmiştir. AFA sonrasında 11 madde ölçekten çıkarılmış ve kalan maddelerin faktör yüklerinin, alan yazında kabul edilen 0,40 ve üzeri faktör yükü sınırının[31-33] üzerinde olduğu bulunmuştur (anne formu için 0,91 ile 0,41 arasında; baba formu için 0,98-0,41 arasında). AFA'nın ardından, DFA toplam 27 madde ile gerçekleştirilmiş ve her iki form için yalnızca iki faktörlü yapının psikometrik özelliklerinin kabul edilebilir uyum kriterlerini karşıladığı gözlenmiştir.[29,30] Sonuç olarak faktör analizleri, ölçeğin ÖDÖ ve ADÖ olmak üzere iki faktörlü bir yapıda olduğuna ve bu iki faktörlü yapının yeterli psikometrik özelliklere sahip olduğuna işaret etmiştir. Yapı geçerliği incelemelerinin ardından ölçme aracının güvenirliği ilk olarak madde-toplam test korelasyonları hesaplanarak değerlendirilmiştir. Madde-test korelasyonlarının anne formu için 0,50 ile 0,79 arasında, baba formu için 0,52 ile 0,85 arasında değiştiği bulunmuştur. Bu değerler alan yazında genel olarak alt sınır olarak kabul edilen 0,30'un oldukça üzerindedir.[31] Buna paralel olarak ölçeğin ve iki faktörlü yapısında yer alan alt faktörlere ait Cronbach alfa iç tutarlılık katsayıları ile Guttman iki yarım güvenirlik katsayılarının hem anne hem de baba formu için 0,90 ve üzerinde olması, ölçeğin güvenirliğinin oldukça yüksek olduğuna işaret etmektedir.[34] Son olarak, kaygılı ve kaçınmacı ve romantik bağlanma ve depresyon puanları ile gösterdiği korelasyonlar hesaplanarak ölçme aracının ölçüt geçerliği incelenmiştir. Korelasyonların neredeyse tamamının beklenir yönde anlamlı olduğu gözlenmiş ve ölçeğin ölçüt geçerliğinin de yüksek olduğu sonucuna ulaşılmıştır.

ADE'nin faktör analizi sonuçlarını ayrıntılı olarak raporlayan çalışmaların sayısı oldukça sınırlı olmasına rağmen daha önceki çalışmaların, ADE'yi tek faktörlü yapıda kullanmış olduğu gözlenmektedir.[3,12,14,35,36] Ancak bu çalışmanın hem anne hem de baba formlarının faktör analizi sonuçları ölçeğin iki faktörlü bir yapıda olduğuna işaret etmektedir. Ölçme aracının ilk alt ölçeği olan ÖDÖ, bireyin diğer aile üyesine yönelik beslediği öznel duygulara işaret eden maddelerden (örneğin; "Bu kişiye çok değer veriyorum." ve "Bu kişiyi her zamankinden daha az gördüğümde çok özlerim.") oluşmaktadır. İkinci faktör olan ADÖ ise bireyin diğer aile üyesinden algıladığı sıcaklığa yönelik maddelerden (örneğin; "Bu kişinin onun için yaptığım şeyleri takdir etmediğini hissediyorum." ve "Bu kişinin yapabileceği halde bana yardım etmeye istekli olmadığını hissederim.") oluşmaktadır. ADE'nin tek faktörlü yapıda kullanıldığı tüm çalışmalar, bireyci kültürlerde gerçekleştirilmiştir. Duygular bireyci kültürlerde sınırlı ve öznel olarak tanımlanırken, toplulukçu kültürlerde, benliğin diğerleri ile ilişkisi bağlamında, diğer bireyler ve ait olunan topluluklar ile ilişkilendirilerek tanımlanma ve anlamlandırılmaktadır.[37] Duyguların, toplulukçu kültürlerde dış dünya hakkında bilgi kaynakları olarak kullanılma eğilimleri daha yüksektir.[38] Batılı kültürlerdeki katılımcıların daha bireyci ve kendi öznel benliklerini odağa alan değerlendirmeler yapma eğilimine karşın, toplulukçu bir kültür olan ülkemizde bireylerin öznel duygusal ve diğeri ile bağlantılı olan duygusal değerlendirmelerinin daha keskin bir şekilde ayrıştırıldığı ileri sürülebilir. Gelecek çalışmalarda ülkemizdeki duygu deneyimleme ve algılama biçimlerinin daha ayrıntılı olarak ele alınması, bu konudaki tartışmayı destekleme potansiyeline sahiptir.

Kültürümüzde, duyguların diğerleri ile ilişki içinde tanımlandığı, deneyimlendiği ve yorumlandığına yönelik bir diğer kanıt, bağlanma ve depresyon değişkenlerinin, algılanan duyguları ifade eden ADÖ ile öznel duyguları ifade eden ÖDÖ'ye kıyasla daha güçlü ilişkiler göstermiş olmasıdır. Diğer bir deyişle, katılımcıların ebeveynlerine yönelik öznel duygularından ziyade, ebeveynlerinden kendilerine yönelik algıladıkları duygusal yakınlığın düşük olması, romantik ilişkilerinde daha fazla kaygılı ve kaçınmacı eğilimler sergilemeleri ve depresif semptomlarının daha şiddetli olmasıyla ilişkili bulunmuştur. ADÖ'nün neredeyse tüm çalışma değişkenleri (kaygılı, kaçınmacı bağlanma ve depresif belirti) ile sergilediği ilişkiler, ÖDÖ'nün aynı değişkenlerle ilişkilerine kıyasla daha güçlüdür (Tablo 5). Örneğin; anneye yönelik bildirilen ADÖ romantik bağlanma kaçınması ile ilişkili bulunurken ÖDÖ'nün aynı bağlanma boyutu ile anlamlı olarak ilişkili olmadığı gözlenmiştir. Toplulukçu kültürlerdeki ebeveynlerin çocuklarının ihtiyaçlarına bireyci kültürlerdeki ebeveynlere kıyasla daha hızlı, hatta bazen çocuğun ihtiyaç sinyali vermesinden bile önce (*proactive sensitivity*) tepki verdiği ve çocuğu çok daha yakından takip ettiği bilinmektedir.[39] Bu doğrultuda, kültürümüzdeki gençlerin özellikle ebeveynlerinden algıladıkları duygusal yakınlığın düşük olmasının, romantik bağlanmalarda güvensiz eğilimler sergilemeleri ve depresif semptomlarının daha şiddetli olmasıyla ilişkili olması beklenir bir bulgudur. Elde edilen bu yöndeki bulgular, özellikle kültürel normlara uygun olmayan ebeveynlik uygulamalarının, bireylerin daha olumsuz sonuçları ile ilişkili olduğunu gösteren araştırma bulgularıyla tutarlılık göstermektedir.[40]

ADE'nin ölçüt geçerliğini değerlendirmek amacıyla gerçekleştirilen analizler, ölçeğin tek faktörlü ve iki faktörlü yapısındaki faktörlerin kaygılı ve kaçınmacı romantik bağlanma ile negatif yönde anlamlı olarak ilişkili olduğunu göstermiştir. Bu yöndeki bulgular, aile iklimi ve ebeveynlerle deneyimlenen etkileşimlerin, bireyin kişiler arası ilişkilerde sergilediği problem çözme gibi becerilerini ve şiddet içerikli eylemlere daha az başvurmasını, dolayısıyla da romantik ilişkilerdeki başarısını

yordadığını gösteren bulgularla tutarlılık göstermektedir.[41] Erken gelişim yıllarında deneyimlenen uygun olmayan ebeveynlik uygulamaları ve olumsuz aile ikliminin, ilerideki romantik ilişkilerde uygun olmayan (örneğin; saldırganca) davranışlara zemin oluşturduğu, boylamsal araştırmalar tarafından ortaya konan bir bulgudur.[16] Romantik bağlanma boyutlarına ek olarak, depresif belirti şiddetinin de ADE ve alt boyutlarının hem anne hem de baba formundan elde edilen puanlarla negatif yönde anlamlı ilişkiler sergilediği gözlenmiştir. Elde edilen bu bulgular, olumlu aile ikliminin, bireyin psikolojik iyi oluşunun yüksek olması ile ilişkili olduğunu gösteren araştırma bulguları ile tutarlılık göstermektedir.[42] Alan yazınla oldukça uyumlu bir şekilde, hem romantik bağlanma kaçınması ve kaygısı hem de depresif belirti şiddeti ile negatif yönde anlamlı ilişkiler göstermesi, ADE'nin ölçüt geçerliğinin yüksek olduğuna işaret etmektedir.

Katılımcıların anne ve baba formuna verdikleri yanıtlar arasındaki farklar incelendiğinde, annelere yönelik bildirilen ADE puanlarının, babalara yönelik puanlardan anlamlı olarak daha yüksek olduğu gözlenmiştir. Elde edilen bu yöndeki bulgular, genellikle anneye yönelik sıcaklığın daha yüksek olduğuna işaret eden araştırma bulguları ile tutarlılık göstermektedir.[20] Neredeyse tüm toplumlarda olduğu gibi ülkemizde de geleneksel olarak babaya ailenin ekonomik geçimini sağlama görevi verilirken anneden, çocukların birincil bakım vereni görevini üstlenmesi ve evde çocuklarla daha fazla zaman geçirmesi beklenmiştir.[43] Günümüz toplumlarında hem anne hem de babanın evin geçimi ve çocukların bakımı sorumluluklarını eşit olarak paylaşma eğiliminde artış olmasına rağmen hala babaların, çocuğun duygusal iyiliğine katkı sağlayan rolü annelere kıyasla daha düşüktür. Araştırmalarda baba-çocuk ilişkilerini değerlendirmede kullanılan ölçme araçlarının, anne-çocuk ilişki dinamikleri dikkate alınarak oluşturulmuş olması ve baba-çocuk ilişki dinamiklerinin biricik boyutlarını gözden kaçırması, gözlenen bu farklılığın nedenlerinden biri olarak düşünülmektedir.[43] Örneğin; bir araştırma, çocuğun olumsuz duygulanımı ile ebeveyn kaynaklarının düşük olmasının (örneğin; yüksek evlilik çatışması) yalnızca babaların çocuğun olumsuz duygularına yönelik destekleyici olmayan duygu sosyalleştirme davranışları ile ilişkili olduğunu, annelerde ise bu ilişkinin anlamsız olduğunu göstermiştir.[44] Dolayısıyla ilerideki araştırmalarda, anneler ve babaların ebeveynlik pratiklerinin farklılıklarının incelenmesi, bu farklılığa uygun değerlendirmeler yapılmasına izin verecek ölçme araçlarının geliştirilmesi, anne ve babaya duyulan duygusal yakınlıktaki farklılıkların daha ayrıntılı olarak incelenmesine imkan sağlayacaktır. Buna ek olarak, bireyin anne ve babasıyla arasındaki ilişki dinamikleri ve bu ilişkilere eşlik eden duyguların farklı yapılarda olduğu dikkate alındığında, ADE'nin kültürümüzdeki kullanımının daha ayrıntılı olarak anlaşılabilmesi için farklı aile üyelerine karşı duyguların değerlendirildiği çalışmalarda da kullanılması oldukça önemlidir.

Çalışmanın Sınırlılıkları

Araştırma, bulguların değerlendirilmesinde dikkate alınması gereken bazı sınırlılıklara sahiptir. İlk olarak, katılımcılara kolay ve hızlı bir şekilde ulaşılabilmesi için kartopu örnekleme kullanılmıştır. Bundan dolayı, örneklemin popülasyonu temsil etme gücünün sınırlandığı vurgulanmalıdır. Üniversite öğrencilerinin, ülkenin pek çok farklı bölgesinden gelmesi ve çeşitli sosyoekonomik gruplara mensup olması bu sınırlılığı azaltmakla birlikte ilerideki çalışmalarda, daha çeşitli şehirlerde ve farklı üniversitelerde okuyan üniversite öğrencilerine ulaşılması, örneklemin popülasyonu temsil ediciliğini destekleyecektir. Veri toplama sürecinde hazırlanan ölçek bağlantısının yalnızca kapalı gruplarla değil, sosyal medya platformları aracılığıyla da paylaşılmış olması, çalışma katılımcılarının tamamının hedef gruba dahil olan bireylerden oluşması konusundaki kontrolü azaltmaktadır. Bu durumun yanlı bir örneklem oluşturmasını engellemek amacıyla demografik sorular oldukça geniş tutulmuş ve demografik özellikleri dahil edilme kurallarına uygun olmayan bireylerden elde edilen veriler analizlere dahil edilmemiştir. Buna ek olarak, çevrimiçi anketin ilk sayfasında dahil edilme kriterleri açıkça belirtilmiş ve anket, katılımcıların tüm dahil olma kriterlerini sağladıklarına dair ifadeyi onaylamadan ilerlemelerine izin vermeyecek şekilde tasarlanmıştır. Buna ek olarak, ADE ülkemizde daha önce tutuklu/hükümlü annelerin dışarıdaki çocuklarının temel bakım verenlerine yönelik duygularını değerlendirmede kullanılmış, dolayısıyla bireyin pek çok farklı yakınlık düzeyindeki aile bireyine dair duygularının değerlendirildiği bir çalışmada işlevselliğini kanıtlamıştır. Ancak, ölçeğin bu çalışmadaki son halinin yalnızca anneye ve babaya yönelik duyguların değerlendirilmesinde kullanılmış olması bir sınırlılık olarak değerlendirilebilir. İlerideki çalışmalarda ölçeğin son halinin diğer aile üyelerine yönelik kullanımının incelenmesi de oldukça önemlidir. Buna ek olarak, bu çalışmada ölçeğin yalnızca bireysel puan üretme özelliği kullanılmış ve genel aile iklimi puanı üretme özelliği incelenememiştir. Gelecek çalışmaların bu açıdan bir inceleme gerçekleştirmesi, ölçeğin kullanım alanlarını genişletmesi açısından önemlidir. Ölçeğin normlarının oluşması açısından, klinik örneklemlerle, farklı yaş gruplarıyla, farklı sosyoekonomik düzeylere ve eğitim düzeylerine sahip bireylerle gerçekleştirilen çalışmalarda kullanılması önemlidir. Bu çalışmada ölçeğin anne ve baba formlarına verilen yanıtlar arasında anlamlı bir fark bulunmasına rağmen katılımcı sayısının sınırlılığı nedeniyle, yanıtlayıcının cinsiyetinin de analizlere dahil edildiği etkileşim analizleri yürütülememiştir. Gelecek çalışmalarda hem yanıtlayıcının hem de kendisine karşı duyguların rapor edildiği aile üyesinin cinsiyetinin dikkate alındığı etkileşim analizleri yapılarak ölçeğin yanıtlanmasında her iki tarafın da cinsiyetinin rolü olup olmadığı incelenmelidir.

Sonuç

Sonuç olarak, bu çalışmadan elde edilen bulgular, ADE'nin aile bireylerine yönelik duyguların değerlendirildiği çalışmalarda geçerli ve güvenilir olarak kullanılabilecek bir ölçme aracı olduğunu göstermektedir. Gerçekleştirilen analizler, ADE'nin bireyin hissettiği öznel duyguları (ÖDÖ) ve diğer aile üyesinden algıladığı duygusal yakınlığı (ADÖ) ifade eden iki boyuta sahip olduğunu ortaya koymuştur. Elde edilen

bulgular, özellikle bizimki gibi toplulukçu, duyguların diğer bireylerle ilişki içinde tanımlandığı kültürlerde, ÖDÖ'ye kıyasla ADÖ'nün diğer araştırma değişkenleri ile daha güçlü ilişkiler gösterdiğine işaret etmiştir. İlerideki çalışmalarda, bu noktanın daha ayrıntılı olarak incelenmesi, kültürümüzdeki duygusal deneyimlerin tanımlanması ve ikili ilişki dinamikleri içinde anlamlandırılmasının anlaşılması açısından kritiktir. Anne ve babalara yönelik duygu puanlarının anlamlı olarak farklılaşması, baba-çocuk ilişkilerinin, anne-çocuk ilişki dinamiklerinden farklı olabileceği ve değerlendirilmesinde daha farklı yaklaşımlar, özellikle bu ilişkinin biricik özelliklerini dikkate alarak geliştirilmiş ölçme araçlarının kullanılmasının uygun olabileceğine yönelik tartışmaları desteklemektedir.

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Dipnotlar

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Parental and Sociodemographic Factors Associated with Problematic Screen Use in Children

Çocuklarda Problemli Ekran Kullanımı ile İlişkili Ebeveynlere Ait ve Sosyodemografik Faktörler

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ABSTRACT

Objectives: Problematic screen use among children is increasing globally. Information regarding problematic screen use during childhood and the factors that may be associated with it is limited. We aimed to investigate the potential factors in problematic screen use in children. Our study examines the associations of sociodemographic and screen-related factors, digital parenting awareness, parents' screen addiction, and parental self-efficacy on screen use of children.

Materials and Methods: The study was conducted in Türkiye and involved 295 children aged 4-11 years. The sociodemographic and screen use-related questions, Problematic Media Use Measure (PMUM)-short form, Digital Parenting Awareness Scale, Perceived Parental Self-Efficacy Scale (PPSES), and Multiple Screen Addiction Scale (MSAS) were utilized.

Results: It was found that 51.2% of the children spent 2 hours or more in front of screens daily. There was a correlation between PMUM scores and the frequency of using screen during family meals (r=0.286), and screen use within one hour before bedtime (r=0.311). A linear regression analysis was conducted to examine variables that could influence PMUM scores. Significant factors found to increase PMUM scores included being male, having a psychiatric disorder, increased screen time, higher digital neglect scores, lower PPSES scores, and higher MSAS scores.

Conclusion: Understanding the associated factors of problematic screen use in children could help mitigate the long-term risks related to this behavior. Emphasizing the parents' role and ensuring their involvement in potential interventions appears crucial.

Keywords: Problematic screen use, children, self-efficacy, digital awareness, parental screen use

ÖZ

Amaç: Çocuklarda sorunlu ekran kullanımı küresel olarak artmaktadır. Çocukluk döneminde sorunlu ekran kullanımı ve bununla ilişkili olabilecek faktörler hakkında bilgiler sınırlıdır. Çocuklarda sorunlu ekran kullanımındaki potansiyel faktörleri araştırmayı amaçladık. Çalışmamız sosyodemografik ve ekranla ilişkili faktörler, dijital ebeveynlik farkındalığı, ebeveynlerin ekran bağımlılığı ve ebeveyn öz yeterliliğinin çocukların ekran kullanımı üzerindeki ilişkilerini incelemektedir.

Gereç ve Yöntem: Çalışma Türkiye'de yürütülmüş olup, 4-11 yaş aralığındaki 295 çocuk çalışmaya dahil edilmiştir. Çalışmada sosyodemografik ve ekran kullanımına ilişkin sorular, Problemli Medya Kullanım Ölçeği (PMKÖ)-Kısa Form, Dijital Ebeveynlik Farkındalık Ölçeği, Algılanan Ebeveyn Yetkinlik Ölçeği (EYÖ) ve Çoklu Ekran Bağımlılığı Ölçeği (ÇEBÖ) kullanılmıştır.

Bulgular: Çocukların %51,2'sinin günlük olarak ekranların önünde 2 saat veya daha fazla zaman geçirdiği bulundu. PMKÖ puanları ile aile yemekleri sırasında ekran kullanma sıklığı (r=0,286) ve uykudan önceki bir saat içinde ekran kullanımı (r=0,311) arasında bir korelasyon vardı. PMKÖ puanlarını etkileyebilecek değişkenleri incelemek için lineer regresyon analizi yapıldı. PMKÖ puanlarını artırdığı bulunan önemli faktörler arasında erkek olmak, psikiyatrik bir rahatsızlığa sahip olmak, artan ekran süresi, daha yüksek dijital ihmal puanları, daha düşük EYÖ puanları ve daha yüksek ÇEBÖ puanları yer aldı.

Sonuç: Çocuklarda sorunlu ekran kullanımının ilişkili faktörlerini anlamak, bu davranışla ilişkili uzun vadeli riskleri azaltmaya yardımcı olabilir. Ebeveynlerin rolünü vurgulamak ve olası müdahalelere katılımlarını sağlamak hayati önem taşımaktadır.

Anahtar Kelimeler: Problemli ekran kullanımı, çocuklar, öz yeterlilik, dijital farkındalık, ebeveyn ekran kullanımı

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Introduction

With the rapid development of technology, screen devices have become more prevalent in our lives. Accordingly, there has been a significant increase in the use of these devices recently.[1] A review investigating screen time in children aged 6-14 years found that approximately 47.0% had two or more hours of screen time per day. Evaluations in similar regions indicated an increase in screen use from 41.3% to 59.4% during the COVID-19 pandemic.[2]

Given these concerning trends in children's screen exposure, understanding parental approaches to managing screen use becomes increasingly important. Parents may struggle to determine limits regarding screens, which are integral to children's daily lives. Various institutions provide information and recommendations on screen use. The Royal College of Psychiatrists advises parents to model appropriate technology use for their children, pay attention to online security, set screen time limits, and encourage balanced activities.[3] Despite these recommendations, compliance is low, with reports indicating that only 1 in 3 children aged 2-5 years adhere to screen guidelines.[4] Excessive screen use in children may be linked to various physical and psychological issues, such as obesity, sleep disorders, anxiety, and depression.[5]

To understand these complex parenting challenges in the digital environment, this study draws upon Bandura's social cognitive theory, which suggests that human behavior stems from the dynamic interaction between individual, behavioral, and environmental factors.[6] In the context of children's screen use, this theoretical lens helps us examine how the digital environment parents create (through digital parenting practices), parents' beliefs about their own capabilities (self-efficacy), and children's observational learning from parental screen behaviors collectively might influence screen use patterns. Within Bandura's framework, the environmental factor-represented by digital parenting practices-becomes particularly crucial. Parents need to develop comprehensive digital parenting skills. In today's digital world, being a "digital parent" involves responding to digital environment needs, being proficient with digital tools, recognizing opportunities, protecting children from risks, and instilling respect for personal rights in the virtual environment as in real life.[7] Parental behaviors in the digital sphere can significantly impact children's problematic screen use.[8] For example, not modeling appropriate screen use can contribute to this problem. Digital neglect (DN), a form of digital parenting, can also be associated with children's problematic screen use. Parental neglect is significantly associated with smartphone addiction in adolescents.[9] Additionally, parents' awareness of the efficient use (EU) of digital media, including the advantages and risks of technology, may be linked to children's problematic use. One study found a negative relationship between parental awareness of efficient digital media use and children's digital game addiction scores.[10] Another aspect of digital parenting awareness is protecting children from screen-related risks.[11] Monitoring children's screen use and content can reduce screen use during childhood.[12]

While digital parenting practices provide the framework for managing children's screen use, parents' confidence in implementing these practices-their parental self-efficacy-represents another crucial factor. Parental self-efficacy is defined as a parent's expectations and beliefs about their ability to parent effectively.[13] Higher parental self-efficacy is associated with reduced screen time in children.[14] Additionally, parental self-efficacy can predict children's screen use.[15] Beyond digital parenting and parental self-efficacy, parents' screen behaviors serve as powerful models for their children. Parental screen use was linked to problematic screen use,[16] increased screen time, and problematic media and video game use.[17]

Problematic screen use in children may differ from that in adolescents because children's access to screens is more dependent on their parents.[18] Based on this understanding and social cognitive theory, our research group focused on children aged 4-11 years. Environmental effects are particularly strong in this age group, with parents serving simultaneously as environmental architects (through digital parenting practices), behavioral models (through their own screen use), and sources of efficacy beliefs (through their confidence in managing digital parenting). In the literature, these parenting-related factors are often investigated separately, but the number of studies examining them in a holistic manner is limited. Understanding their combined and interactive effects may provide more comprehensive insights into preventing and addressing problematic screen use in childhood. Furthermore, understanding how well parents implement practices related to sleep and eating-areas that receive limited emphasis in many studies-as well as screen time limitations, which are emphasized in guidelines, could provide valuable information. Our research can contribute to advancing knowledge in this area.

Therefore, this study aims to examine how sociodemographic variables, child screen use characteristics, and multiple parental factors-including digital parenting awareness, parental self-efficacy, and parental screen use behaviors- collectively influence problematic screen use in children aged 4-11 years.

Materials and Methods

Participants and Procedure

The study population comprises parents with children aged between 4 and 11. All participants who had children within this age range and agreed to take part in the study were included. The study sample was collected online. An online form consisting of 71 questions—covering sociodemographic and screen use-related questions, the Digital Parenting Awareness Scale, the Perceived Parental Self-Efficacy Scale (PPSES), the Problematic Media Use Measure (PMUM)-short form, and the Multiple Screen Addiction Scale (MSAS) was created on a survey platform. We used snowball sampling for reaching the participants. Before starting the study, a power analysis was performed to determine the required sample size for this type of research. Reference findings from a study examining the correlation between a parent's and child's screen addiction

revealed a moderate effect.[19] Assuming a smaller effect size (r=0.2), it was determined that 90.0% power could be achieved with a 95.0% confidence level (5.0% type 1 error rate) when a minimum of 255 participants were included in the study.

The data collection began on November 2, 2022, and lasted for a duration of three months. The survey form was distributed to 477 individuals, of whom 472 agreed to participate. Forty-two children were not included in the study since their age was not in the evaluated age group. Out of the remaining 430 participants, 295 completed the research forms.

The Non-Interventional Clinical Research Ethics Committee of Pamukkale University approved the study with the decision dated October 18, 2022, and numbered E-60116787-020-279007. All participants provided informed consent, and the study was conducted in line with the Declaration of Helsinki.

Measures

Sociodemographic and Screen Use-Related Questions: In the form created by the researchers, questions are asked about the child's age, gender, family composition, parental education level, and family income. It also assessed whether the child had any psychiatric disorders or chronic physical diseases. In addition, there are questions to understand the child's screen use, such as screen time, the purpose of screen use, parental content monitoring, whether there are limitations related to screen use, whether screen use occurs during meals, and whether screen use occurs before sleep.

Problematic Media Use Measure-Short Form: It was developed by Domoff et al.[18] This scale assesses problematic screen usage in children aged 4-11 years. It consists of 9 items; each rated on a 5-point Likert scale ranging from 1 (never) to 5 (always). The total score is derived by summing the item scores and dividing by 9. Higher scores indicate more problematic media use. Furuncu and Öztürk[20] performed the validity and reliability of the scales' Turkish version.

Digital Parenting Awareness Scale: Manap and Durmuş[21] created the scale, which includes 16 questions and four sub-dimensions: negative modeling (NM), which measures parents demonstrating poor digital habits that children may imitate; DN, which assesses using digital devices as a substitute for parenting or avoiding active interaction with children; EU, which measures intentional and appropriate use of digital tools with children; and protection from risks (PR), which evaluates proactive measures to protect children from online dangers and harmful content. Questions are scored on a Likert scale ranging from 1 to 5, with sub-dimension scores ranging from 4 to 20. Each sub-dimension is evaluated separately. Higher scores on the NM and DN sub-dimensions are linked to lower digital parenting awareness, while higher scores on the PR and EU sub-dimensions are linked to higher digital parenting awareness.[21]

Perceived Parental Self-Efficacy Scale: Caprara et al.[22] developed the scale. The scale measures parents' competencies in supporting and communicating openly with their children, managing parent-child conflicts, maintaining self-confidence, and effectively coping with new situations. The Turkish adaptation of the scale was validated and tested for reliability by Demir and Gündüz.[23] The original version consists of 12 items, whereas the Turkish version includes 11 items. Each item is rated on a 7-point scale ranging from 1 (highly inadequate) to 7 (highly adequate). Higher scores indicate greater parental self-efficacy.[23]

Multiple Screen Addiction Scale: Sarıtepeci[24] developed the scale to assess addiction to multiple screens (TV, computer, tablet, phone, etc.). The scale contains 15 items across three sub-dimensions: compulsive behavior, loss of control, and excessive screen time. Items are scored on a 5-point scale ranging from 1 (never) to 5 (always). The total scale score is used to evaluate addiction status, with higher scores indicating a greater risk of multiple screen addiction.[24]

Statistical Analysis

Statistical analyses were conducted using SPSS 25.0 (IBM SPSS Statistics 25; Armonk, NY: IBM Corp.). Continuous variables were reported as the mean, standard deviation, median [interquartile range (IQR): 25^{th}-75^{th} percentiles], and minimum and maximum values, while categorical variables were reported as the number and percentage. Normality was assessed using the Shapiro-Wilk and Kolmogorov-Smirnov tests. The Mann-Whitney U test and Kruskal-Wallis variance analysis (post hoc: Mann-Whitney U test with Bonferroni correction) were performed for group comparisons. The Spearman correlation coefficient was utilized to examine the relationship between continuous variables. Univariate and multivariate linear regression models were used to investigate the effects of independent factors on the PMUM. First, univariate analyses were conducted using sociodemographic and child screen use variables, digital parenting awareness subscales, the PPSES, and the MSAS. Then, multivariate analyses were performed with the variables found to be statistically significant in the univariate analyses. Multicollinearity was assessed using variance inflation factors. Statistical significance was considered at $p<0.05$.

Results

Sample Characteristics and Screen Usage Patterns

The number of females slightly exceeded that of males, accounting for 52.2% of the children. The mean age of the children was 7.85 years [standard deviation (SD)=2.11]. The mean age of the mothers of these children was 38.19 years (SD=4.61), and the fathers were 40.98 years (SD=5.35). A significant majority, 87.1%, of families were nuclear families. Most parents had achieved higher education, with 62.7% of mothers and 61.7% of fathers being university graduates. Over half of the families, 54.6%, identified themselves as middle class. The percentage of children with chronic physical diseases was 13.2%, and that of those with psychiatric disorders was 6.4%.

In terms of screen usage, 51.2% of children spent two or more hours daily in front of a screen. Specifically, 30.4% spend exactly 2 hours, 11.9% spend 3 hours, 5.1% spend 4 hours, and 3.8% spend more than 5 hours daily. Notably, 87.8% of families set

limitations on screen use, and 96.6% monitored the content of the screen usage. The main purposes for children's screen use were watching videos (55.3%), playing games (47.1%), and watching TV (44.4%). When screen use during family meals and 1 hour before bedtime was examined, the majority of families reported some level of screen use for their children. For family meals, 51.2% reported occasional screen use ("sometimes"), while 13.2% reported "often" using screens and 6.8% reported "always" using screens during meals, meaning 71.2% of families used screens during family meals to some degree. Similarly, for the hour before bedtime, 63.1% reported "sometimes" using screens, 19.0% reported "often," and 5.4% reported "always," with 87.5% of families reporting some level of screen use before bedtime (Table 1).

The participants' scores on the PMUM, Digital Parenting Awareness Scale, MSAS, and PPSES are presented in Table 2.

Problematic Media Use Analysis

When the PMUM scores were compared according to sociodemographic variables, males had significantly higher scores than females [Median (Mdn)=2.00, IQR=1.56-2.78 vs. Mdn=1.67, IQR=1.22-2.47, p=0.001]. Children with reported psychiatric disorders also demonstrated significantly higher scores compared to those without psychiatric disorders (Mdn=2.78, IQR=1.56-3.56 vs. Mdn=1.89, IQR=1.44-2.56, p=0.013). No significant differences were found in comparisons according to family composition (p=0.485) or chronic disease status of children (p=0.403). Additionally, no significant correlations were found between PMUM scores and maternal and paternal age (p=0.077 and p=0.093), maternal and paternal education level (p=0.368 and p=0.212), or family income level (p=0.954).

Although no statistical difference was observed between participants who reported setting screen time limits and those who did not (p=0.701), children whose screen content was not monitored by parents demonstrated significantly higher PMUM scores than those whose content was monitored (Mdn=2.83, IQR=1.94-3.22 vs. Mdn=1.89, IQR=1.44-2.56, p=0.022). Daily screen time of children, the frequency of screen use during family meals and frequency of screen use within 1 hour before bedtime had significant positive correlations with PMUM scores (r=0.499, r=0.286, and r=0.311, respectively; p<0.001 for all three).

Table 3 shows that PMUM scores correlated positively with screen time, screen use during meals, screen use within 1 hour before bedtime, NM, DN, and MSAS scores and negatively with PR, EU, and PPSES scores.

Linear regression analysis was conducted to examine the factors influencing the PMUM scores, with univariate model results presented in Table 4. The analysis began with univariate analyses before moving to multivariate analyses, including variables significant in the univariate analysis.

Child's gender, father's age, the child's psychiatric disorder, screen time, content monitoring, using screens during meals, screen use within 1 hour before bedtime, and the NM, EU, PR, DN, PPSES, and MSAS scores were associated with PMUM scores on univariate analyses. The multivariate model included only those factors that showed statistical significance in the univariate analysis presented in Table 5. The presence of a psychiatric disorder, an increase in screen time, an increase in DN scores, a decrease in PPSES scores, an increase in MSAS scores, and gender (male) were all found to have a significant impact on PMUM scores.

Table 1. Sample characteristics and participants' screen usage data

Baseline characteristics	Full sample	
	n	%
Gender		
Female	154	52.2
Male	141	47.8
Family composition		
Nuclear family	257	87.1
Extended family	22	7.5
Parents divorced	15	5.1
One or more parents died	1	0.3
Maternal education		
Non-educated	1	.3
Primary-middle school	13	4.4
High school	35	11.9
University	185	62.7
Post graduate and higher	61	20.7
Paternal education		
Primary-middle school	8	2.7
High school	42	14.2
University	182	61.7
Post graduate and higher	63	21.4

Table 1. Continued

Baseline characteristics	Full sample	
	n	%
Income		
Low	8	2.7
Middle	161	54.6
High	126	42.7
Chronic disease of the child		
No	256	86.8
Yes	39	13.2
Psychiatric disorder of the child		
No	276	93.6
Attention-deficit hyperactivity disorder	11	3.7
Learning disorder	3	1.0
Anxiety disorder	3	1.0
OCD	1	0.3
ASD	1	0.3
How much time does your child spend in front of a screen per day?		
None	5	1.7
0-1 hour	72	24.6
1 hour	66	22.5
2 hours	89	30.4
3 hours	35	11.9
4 hours	15	5.1
More than 5 hours	11	3.8
Do you limit your child's screen		
No	36	12.2
Yes	259	87.8
Do you monitor the content of your child's screen use?		
No	10	3.4
Yes	285	96.6
Do you use any screens when you eat meals as a family?		
Never	85	28.8
Sometimes	151	51.2
Often	39	13.2
Always	20	6.8
Does your child use screens in the hour before sleep?		
Never	37	12.5
Sometimes	186	63.1
Often	56	19.0
Always	16	5.4
Screen usage purpose		
Watching TV	131	44.4
Watching video	163	55.3
Games	139	47.1
Education	77	26.1
Communication	19	6.4
Socializing	9	3.1

OCD: Obsessive compulsive disorder, ASD: Autism spectrum disorder

Table 2. Participants' scores on the scales

	Mean ± SD	Median (IQR)	Min-max
PMUM	2.04±0.79	1.89 (1.44-2.67)	1-4.78
Negative modelling	8.32±2.53	8 (7-10)	4-19
Digital neglect	8.79±2.88	8 (7-11)	4-18
Efficient use	15.92±2.38	16 (14-18)	7-20
Protecting from risks	14.84±3.14	15 (13-17)	6-20
MSAS	30.73±9.65	29 (23-38)	15-63
PPSES	60.22±8.69	60 (55-66)	19-77

SD: Standard deviation, IQR: Interquartile range, Min-max: Minimum-maximum, PMUM: Problematic Media Use Measure, MSAS: Multiple Screen Addiction Scale, PPSES: Perceived Parental Self Efficacy Scale

Table 3. Associations of the PMUM with other scales and sociodemographic and screen-related variables

		PMUM
Age	r	0.081
	p	0.167
Mother's age	r	0.103
	p	0.077
Father's age	r	0.098
	p	0.093
Maternal education	r	-0.053
	p	0.368
Paternal education	r	-0.073
	p	0.212
Income	r	-0.003
	p	0.954
How much time does your child spend in front of a screen per day?	r	0.499*
	p	<0.001
Do you use any screens when you eat meals as a family?	r	0.286*
	p	<0.001
Does your child use screens in the hour before sleep?	r	0.311*
	p	<0.001
Negative modelling	r	0.332*
	p	<0.001
Digital neglect	r	0.562*
	p	<0.001
Efficient use	r	-0.227*
	p	<0.001
Protecting from risks	r	-0.209*
	p	<0.001
PPSES	r	-0.335*
	p	<0.001
MSAS	r	0.491*
	p	<0.001

*p<0.05 statistically significant. PMUM: Problematic Media Use Measure, PPSES: Perceived Parental Self Efficacy Scale, MSAS: Multiple Screen Addiction Scale

Discussion

This research examined the characteristics of screen usage among preschool and elementary school-aged children, the association between problematic media use of children and parental self-efficacy, digital parenting awareness, parental multiple-screen addiction, and the factors influencing problematic media use among children.

The study results indicated that about 50.0% of children spent 2 hours or more per day in front of screens. According to the Australian physical activity guidelines, children aged 5-17 years should not exceed 2 hours of screen time per day.[25] Increased screen time has been associated with sleep problems, overweight, or obesity.[26] In our study, it is concerning that approximately 50.0% of the children exceeded the recommended screen time, particularly given the potential health issues that may arise. Although 87.8% of the participating parents indicated that they set limitations on screen use, considering the 50.0% rate of exceeding recommended screen time, it may be appropriate to provide parents with information about screen use and strategies for appropriate approaches.

Another finding was that increased screen time had an increasing effect on PMUM scores. Rega et al.[27] noted that the amount of time spent on media is a risk factor for developing problematic media use in children under 10. Our study aligns with this literature, though it should be remembered that screen time may contribute to problematic media use alongside many other factors.[28] Our study also found that families who did not monitor screen content had higher PMUM scores. Not monitoring screen content contributes to problematic screen use.[29] Lack of content monitoring may reflect a general parental style regarding screen use, leading to unsupervised and problematic screen use by the child. This relationship requires further investigation.

Nearly three-quarters of children were found to use screens during family meals. Jusienė et al.[30] reported that more than half of children are exposed to screens during meals. Exposure to screens during meals may increase food consumption.[31] The high prevalence of screen use and its association with increased food consumption may pose a risk to children's health, highlighting the need to raise awareness at the societal level.

Table 4. PMUM scores univariate linear regression analysis

Univariate models	Std. beta	t	p	95% CI lower	95% CI upper
Age	0.072	1.239	0.217	-0.016	0.07
Gender (ref: female)	0.182	3.166	0.002*	0.109	0.468
Mother's age	0.105	1.802	0.073	-0.002	0.038
Father's age	0.129	2.224	0.027*	0.002	0.036
Maternal education	-0.046	-0.782	0.435	-0.174	0.075
Paternal education	-0.071	-1.217	0.225	-0.216	0.051
Family composition (ref: nuclear family)	-0.048	-0.83	0.407	-0.386	0.157
Income	-0.007	-0.114	0.909	-0.178	0.158
Chronic disease of the child (ref: no disease)	0.091	1.558	0.12	-0.056	0.48
Psychiatric disorder of the child (ref: no disorder)	0.186	3.238	0.001*	0.235	0.964
How much time does your child spend in front of a screen per day?	0.51	10.112	<0.001*	0.24	0.356
Do you limit your child's screen use? (ref: no limit)	-0.052	-0.885	0.377	-0.403	0.153
Do you monitor the content of your child's screen use? (ref: no monitor)	-0.144	-2.491	0.013*	-1.128	-0.132
Do you use any screens when you eat meals as a family?	0.29	5.185	<0.001*	0.171	0.381
Does your child use screens in the hour before sleep?	0.325	5.873	<0.001*	0.241	0.484
Negative modelling	0.343	6.249	<0.001*	0.074	0.141
Digital neglect	0.587	12.399	<0.001*	0.136	0.188
Efficient use	-0.224	-3.933	<0.001*	-0.112	-0.037
Protecting from risks	-0.219	-3.836	<0.001*	-0.084	-0.027
PPSES	-0.304	-5.465	<0.001*	-0.038	-0.018
MSAS	0.507	10.07	<0.001*	0.034	0.05

*p<0.05 statistically significant. CI: Confidence interval, ref: reference class, PMUM: Problematic Media Use Measure, PPSES: Perceived Parental Self Efficacy Scale, MSAS: Multiple Screen Addiction Scale, Std: Standard

Table 5. PMUM scores multivariate linear regression analysis

Multivariate model	Std. beta	t	p	95% CI lower	95% CI upper	VIF
Gender	0.098	2.364	0.019*	0.026	0.286	1.039
Father's age	0.052	1.213	0.226	-0.005	0.02	1.102
Psychiatric disorder of the child	0.177	4.255	<0.001*	0.305	0.831	1.037
How much time does your child spend in front of a screen per day?	0.215	4.094	<0.001*	0.065	0.186	1.653
Do you monitor the content of your child's screen use?	-0.056	-1.318	0.189	-0.611	0.121	1.093
Do you use any screens when you eat meals as a family?	0.032	0.682	0.495	-0.057	0.117	1.295
Does your child use screens in the hour before sleep?	0.042	0.854	0.394	-0.061	0.155	1.460
Negative modelling	-0.075	-1.356	0.176	-0.058	0.011	1.849
Digital neglect	0.287	5.154	<0.001*	0.049	0.109	1.857
Efficient use	-0.057	-1.142	0.254	-0.051	0.014	1.474
Protecting from risks	0.04	0.8	0.424	-0.015	0.035	1.503
PPSES	-0.096	-1.998	0.047*	-0.017	0	1.377
MSAS	0.32	5.883	<0.001*	0.017	0.035	1.781

*p<0.05 statistically significant. Model R^2: 0,535. CI: Confidence interval, PMUM: Problematic Media Use Measure, PPSES: Perceived Parental Self Efficacy Scale, MSAS: Multiple Screen Addiction Scale, VIF: Variance inflation factor, Std: Standard

Our study also found that as screen use during meals increased, so did PMUM scores. Longer daily screen time increases the likelihood of children eating in front of screens.[30] Children who consume their meals in front of screens may exhibit prolonged daily screen usage, contributing to higher PMUM scores. The percentage of children who reported using screens within 1 hour before bedtime was 87.5%. As the frequency of screen use before bedtime increased, so did PMUM scores. Increased PMUM scores with higher pre-bedtime screen use suggest that screen usage, even close to bedtime, likely correlates with overall daily usage. High frequency of screen use may also indicate low-level parental awareness in this regard.

In the regression analysis, the child's gender (male) was a significant factor in the multivariate model. Husárová et al.[32] found that boys used screens more than girls in Slovak children. Another study also found that boys had higher rates of screen addiction.[33] Our findings are consistent with this literature. Our study also found that having a psychiatric disorder was associated with higher PMUM scores. A study in Türkiye found that children with psychiatric disorders had longer screen times than those without and that increased screen time may relate to impaired functionality.[34]

Another factor found to increase PMUM scores in the regression analysis was an increase in DN subscale scores. A study in Japan found that children's screen time was associated with their parents' digital media awareness.[35] Additionally, children from families with neglectful parenting styles are more likely to exhibit problematic internet use.[36] Increased parental DN or low digital parental awareness may indicate that parents allow their children to use digital devices instead of engaging with them, especially during challenging times. This may lead to higher problematic media use scores among children.

Our study also found that higher parental self-efficacy scores decreased PMUM scores. High parental efficacy is associated with meeting children's needs throughout childhood, exhibiting warm and compassionate parenting behaviors, and greater involvement in daily learning and play activities.[37] A review found that high task-specific self-efficacy in parents was associated with reduced screen time for children.[38] High parental self-efficacy may enable parents to effectively guide their children towards non-screen activities, such as learning and play, thereby reducing their PMUM scores.

Finally, our study found that an increase in parental MSAS scores increased PMUM scores. Nagata et al.[17] showed that parental screen usage correlated with prolonged screen time in adolescents. A study examining parental modeling effects on children's screen time revealed that children tend to emulate their parents' screen behaviors.[39] Our finding may be related to this modeling behavior.

The findings of this study can be interpreted within Bandura's social cognitive theory, which emphasizes the interplay between personal, behavioral, and environmental factors in shaping human behavior.[6] From an environmental perspective, our results highlight the importance of digital parenting practices-particularly DN-in influencing children's media habits. Parents with higher digital parenting awareness may exert a protective influence against problematic media use, consistent with social cognitive theories principle that environmental contexts and behavioral patterns mutually influence one another.[6] At the behavioral level, the relationship between parents' own screen use (i.e., multiple screen addiction) and children's problematic media use reflects the process of observational learning of social cognitive theory.[40] Children may tend to imitate screen-related behaviors modeled by their parents.[39] From a personal perspective, the link between parental self-efficacy and children's problematic screen use aligns with Bandura's assertion that perceived self-efficacy influences behavior through its effects on the selection of activities and environments.[41] Parents with higher self-efficacy may be better able to regulate their children's screen exposure and promote alternative, non-digital activities. Taken together, these findings offer insights into how personal (self-efficacy), behavioral (parental screen use), and environmental (digital parenting) factors dynamically interact to shape children's screen use patterns. Accordingly, interventions designed to prevent problematic media use in childhood may benefit from strategies that strengthen parental self-efficacy, promote mindful modeling of media behaviors, and foster consistent, informed digital parenting practices.

Study Limitations

Although our study contributes to the understanding of problematic screen use in children, it has some limitations. First, the use of a snowball sampling method may have limited the inclusion of families from lower socioeconomic backgrounds. Second, the cross-sectional design and the uncertainty regarding the data collection locations limit the generalizability of the findings. Third, as the study focused on children, only parents' opinions were sought. Reliance on parent-reported measures may have introduced social desirability bias, as parents could have underreported or overreported their own or their child's screen-related behaviors. Finally, children's psychiatric disorder status was based on parental reports without clinical verification, which should be considered when interpreting the observed associations.

Conclusion

Our study highlighted several factors associated with problematic screen use in children. These factors include being male, spending more time in front of screens, having a psychiatric disorder, higher DN scores, lower parental self-efficacy scores, and higher parental screen addiction scores. Parental factors especially stand out in relation to problematic screen use in children. Efforts to increase parental awareness and improve societal understanding would be beneficial. Parental involvement in children's daily activities and taking a more active role outside of screens could mitigate problematic screen use in children.

Ethics

Ethics Committee Approval: The Non-Interventional Clinical Research Ethics Committee of Pamukkale University approved the study with the decision dated October 18, 2022, and numbered E-60116787-020-279007.

Informed Consent: All participants provided informed consent, and the study was conducted in line with the Declaration of Helsinki.

Footnotes

Authorship Contributions

Concept: A.B., M.A.T., Design: A.B., M.A.T., Data Collection or Processing: A.B., M.A.T., H.Ş., Analysis or Interpretation: A.B., H.Ş., Literature Search: A.B., M.A.T., Writing: A.B., M.A.T., H.Ş.

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Differences Between Mother-Toddler and Father-Toddler Interaction and Psychiatric Clinical Utility of Parent-Toddler Interaction Multiaxial Assessment (PTI-MAXA) Scale

Anne-Bebek ve Baba-Bebek Etkileşimi Arasındaki Farklılıklar ve Ebeveyn-Bebek Etkileşimi Çok Eksenli Değerlendirme (PTI-MAXA) Ölçeğinin Psikiyatrik Klinik Kullanımı

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ABSTRACT

Objectives: The Parent-Toddler Interaction Multiaxial Assessment (PTI-MAXA) was developed to evaluate the interaction between a parent and their 1-3-year-old toddler and to score dimensions of interaction quality. In this study, we aimed to assess the differences in interaction dimensions between mother-toddler and father-toddler dyads. In addition, we aimed to examine the distinctive utility of PTI-MAXA with respect to psychiatric and neurodevelopmental morbidity in toddlers.

Materials and Methods: Participants were 105 children aged 13-40 months [mean: 27.28±6.7 months; (male, n=63; female, n=42)] and their mothers aged 22-46 (mean: 31.5±4.8) years and fathers aged 26-47 (mean: 34.7±4.7) years. Various psychometric measures, including the Brief Infant and Toddler Social Emotional Assessment Scale, Aberrant Behavior Checklist, Brief Symptom Inventory, and Beck Depression Inventory, were employed alongside the PTI-MAXA assessment. Toddlers participated significantly more in interactions with their mothers than with their fathers, and mothers had substantially higher reciprocity scores than fathers.

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ABSTRACT

Results: Regardless of autism status, boys had significantly lower PTI-MAXA scores, particularly when assessed with their mothers. PTI-MAXA discriminated among clinical diagnostic groups, particularly the autism spectrum. Mothers demonstrated more participatory and reciprocal interactions with their 1-3-year-old children than did fathers. Moreover, mother-toddler and father-toddler interactions differed significantly, especially between genders. The PTI-MAXA demonstrated reliable global ratings of mother-toddler and father-toddler interactions during 40-50 minutes of videotaped play in a laboratory setting.

Conclusion: These findings underscore the usefulness, validity, and reliability of PTI-MAXA for clinical applications.

Keywords: Mother-toddler, father-toddler, interaction, PTI-MAXA

ÖZ

Amaç: Ebeveyn-Bebek Etkileşimi Çok Eksenli Değerlendirme (PTI-MAXA), anne/baba ve 1-3 yaş arası bebekleri arasındaki etkileşimi değerlendirmek ve etkileşim kalitesinin farklı boyutlarını puanlamak için geliştirilmiştir. Bu çalışmada, anne-çocuk ve baba-çocuk çiftleri arasındaki etkileşim boyutlarındaki farklılıkların değerlendirilmesi amaçlanmıştır. Ayrıca, bu değerlendirmenin erken dönemde çocuğun psikiyatrik ve nörogelişimsel morbiditesi açısından ayırt edici özelliğinin incelenmesi amaçlanmıştır.

Gereç ve Yöntem: Katılımcılar 13-40 aylık [ortalama: 27,28±6,7 ay; (erkek, n=63; kız, n=42)] 105 çocuk ve 22-46 (ortalama: 31,5±4,8) yaşlarındaki anneleri ve 26-47 (ortalama: 34,7±4,7) yaşlarındaki babalarından oluşmaktadır. PTI-MAXA değerlendirmesinin yanı sıra Kısa Bebek/Çocuk Sosyal ve Duygusal Değerlendirme Ölçeği, Anormal Davranış Kontrol Listesi, Kısa Semptom Envanteri ve Beck Depresyon Envanteri gibi çeşitli psikometrik ölçümler kullanılmıştır.

Bulgular: Otizmden bağımsız olarak, erkek çocukların özellikle annelerinde PTI-MAXA skorları anlamlı derecede düşük bulunmuştur. PTI-MAXA'nın başta otizm spektrumu olmak üzere klinik tanı grupları açısından ayırt edici olduğu görülmüştür. Anneler, babaların aksine 1-3 yaşındaki çocuklarıyla daha katılımcı ve karşılıklı etkileşimler sergilemiştir. Ayrıca, anne-çocuk ve baba-çocuk etkileşimleri özellikle cinsiyetler arasında önemli farklılıklar göstermiştir. PTI-MAXA, laboratuvar ortamında videoya kaydedilen 40-50 dakikalık oyun sırasında anne/baba-çocuk etkileşimlerinin güvenilir genel derecelendirmeler ile ortaya çıkmıştır.

Sonuç: Bu bulgular, PTI-MAXA'nın klinik uygulamalar için kullanışlılığını, geçerliliğini ve güvenilirliğini vurgulamaktadır.

Anahtar Kelimeler: Anne-çocuk, baba-çocuk, etkileşim, PTI-MAXA

Introduction

The early years of life are fundamentally important for healthy development across all areas of functioning (emotional, linguistic, cognitive, and sensory). In terms of early childhood brain development and mental health, the importance of the quality of the toddlers' interaction with their primary caregivers, especially parents, has been emphasized for many years.[1-3] Research indicates that parental psychopathology and genetic predispositions for psychiatric disorders heighten the risk of developmental challenges, stemming from parental conflicts, disruptions in parent-child relationships, and elevated interpersonal stress levels.[4] In particular, it is stated that the mother's ability to respond to the toddler's cues/messages in an appropriate, finely-tuned manner is pivotal for the toddler's emotional control.[5,6] And emotional sharing/empathy.[7] For the toddler to achieve autonomy and safely explore their environment, both the mother and father must possess adequate parenting skills during this process.[8,9]

Parents are regarded as the primary socializers of children's emotions, especially for toddlers.[10,11] Through responsive parent-child interactions - particularly by their capacity for mentalization - parents help children recognize, understand and resolve negative emotional experiences.[12] Emotional regulation and adaptation in early childhood are influenced by the emotional climate within the family.[11] Social learning theory relates to play in various ways, but the most important of these is the way parents may use "play as practice". Essentially, through play, parents can impart cognitive and social skills such as communication and language, turn-taking, and autonomy development to their young child.[13,14] Evidence suggests that toddlers learn through their parents' play. For instance, cross-cultural findings have shown that toddlers tend to engage in similar types of play when their parents emphasize specific types of play.[15,16] Lamb[17] has emphasized the importance of parental warmth, support, accessibility, and responsiveness during interactions. Higher levels of caregiver sensitivity have been consistently associated with more positive child development.[18]

Children exhibiting high levels of irritability, negative mood, and irregular behavioral and biological patterns appear to engage in lower-quality interactions with their parents.[19] Parental sensitivity is defined as the parent's ability to perceive and interpret the child's signals and needs accurately, and respond appropriately and promptly.[20] Parental sensitivity is considered a fundamental parenting behavior and serves as a key antecedent in establishing a secure caregiver-child attachment relationship.[20,21]

On the other hand, "new fathers" are increasingly striving to establish close relationships with their children from the earliest stages of development and are actively involved in parenting responsibilities.[22] Recent findings from a study[23] indicate that father-child, but not mother-child, synchrony was associated with less distress in toddlers and that reported interparental relationship satisfaction by fathers was significantly associated with children's coping skills. Positive father-toddler interactions contribute positively to children's cognitive and socio-emotional development directly[24] and indirectly (e.g., by influencing mother-toddler interactions).[25-27] Fathers who are highly involved (in terms of time spent with their children) are likely to have more empathetic sons and daughters showing more internal locus of control.[28,29] The interaction style of fathers with young children differs from that of mothers and is characterized by more physical contact and rough-and-tumble play.[30-32]

Support and responsiveness from fathers during stimulating play activities are also associated with higher father-child attachment security.[33] Additionally, paternal responsiveness during play is related to a child's self-regulation and language skills.[34-36]

A number of structured assessment methods are available to evaluate mother/father-toddler interactions using objective criteria. The Parental Playfulness Scale,[25] the Rough and Tumble Play Questionnaire[37] and the Père-En-Jeux Questionnaire[38] are some of the self-report measures available.[18] However, self-report measures may be considered for ensuring the validity of scientific data. Another method used to evaluate mother-toddler interaction is "emotional availability," but it does not address the mother and child separately, and no structured format is recommended in this assessment method.[39] Another assessment method is the "Parent-Child Interaction Teaching Task".[40] Parents are asked to teach their children how to perform an activity, which lasts between 1 and 7 minutes. In the "Frustration Task,"[41] the researcher presents the child with 3 toys, and the child chooses one to play with for one minute. This method evaluates the child's interaction with the parent in a single situation. The Play Scale[42] is a global rating scale developed to assess mother-toddler/child play interactions. Recently, Olofson and Schoppe-Sullivan[43] developed a coding system for measuring the quality of parenting behavior to examine associations with children's social-emotional development.

As previously Gardner,[44] and recently Funamoto and Rinaldi[45] and Dishion et al.[46] addressed the methodological issues in the direct observation of parent-child interactions, and there are several instruments to assess the interaction between parent and toddler, there is a limited number of recommended structured interview/play formats for interpreting these dimensions. In addition, parents and their child are not assessed separately in these evaluations. The ratings obtained may sometimes be subjective and oversimplified. In terms of clinical assessment, it seems very important to observe parent-toddler/child interactions not only in environments where the child and/or parent is distressed but also in environments where activities may be enjoyable.[47-49] There is evidence that observation settings such as free play enhance the validity of the interpretation of general observations.[42,50] Developing a standardized set of measurement tools, consistently employed across studies, would significantly bolster the field's advancement with heightened confidence.[18]

The Parent-Toddler Interaction Multiaxial Assessment (PTI-MAXA) developed by Karabekiroğlu et al.[51] is an original method designed to evaluate the quality of the interaction between toddlers aged 1-3 years and their mothers in a laboratory setting and scoring the components of the interaction. As the dyad is observed in different semi-structured interaction settings and toddlers and parents are scored separately on different dimensions of interaction and attachment, PTI-MAXA is termed a multiaxial assessment. Subsequently, this method also showed robust validity-reliability outcomes for father-toddler dyads as well.[52] This method addresses parent-toddler interaction across various dimensions, observes the child's attachment pattern, and offers the opportunity to work with parents to improve parent-toddler interaction constructively and functionally. In this study, we aimed to assess differences in dimensions of interaction between mother-toddler and father-toddler couples. In addition, we aimed to examine the distinctive utility of PTI-MAXA in terms of toddlers' psychiatric and neurodevelopmental morbidity, such as differences between autism cases, language development, and social and emotional problem scores. In this study, we aimed to investigate the differences between mothers and fathers in the quantity and quality of interactions with their toddlers. In addition, we aimed to assess the clinical utility of PTI-MAXA scores, including their capacity to differentiate typically developing children from children with neurodevelopmental disorders.

Materials and Methods

Participants

The required sample size for each group was calculated to be a minimum of 40, with 95% power and a 5% Type 1 error, using the Minitab 17.0 program. However, since various subgroup analyses were planned, the aim was to include a total of 100 children and their parents, with backups for potential data loss (110 mother-father-toddler triads included). A total of 11 centers, involving 105 children aged 13-40 months and their mothers and fathers, participated in the study. The participants were recruited from pediatric and psychiatry clinics to enable the inclusion of individuals with psychiatric conditions and control subjects. The subjects were randomly selected. The evaluators were blinded to the clinical symptoms and/or developmental problems of the toddlers and their parents. Both coders of PTI-MAXA at each center were specialists in child and adolescent psychiatry and/or residents, and they underwent training in scoring the scales to ensure consistency and accuracy.

Measures

1. Sociodemographic and Clinical Data Form (SCDF)

This form, created by the researchers, records sociodemographic information such as age, gender, children's developmental stages, educational status, medical history, presence of past or current psychiatric disorders, use of psychotropic medication, and history of psychiatric illness among close relatives. This was completed by the researcher during the clinical interview.

2. Assessment Tools for Parents

2.1. Brief Symptom Inventory (BSI)

BSI is a 53-item self-report version derived from the 90-item revised symptom checklist, developed by Derogatis and Melisaratos[53] to assess psychiatric problems across various medical conditions. Using a 5-point Likert-type scale, participants are instructed to select one of the following options: "not at all," "a little bit," "moderately," "quite a bit," and "extremely," corresponding to scores of 0, 1, 2, 3, and 4, respectively. Both mothers and fathers completed this inventory.

2.2. Beck Depression Inventory (BDI)

The BDI consists of 21 items assessing symptoms over the past week. Each item is scored on a scale of 0 to 3, with 0 indicating the absence of depressive symptoms and 3 indicating severe depressive symptoms.[54] The Turkish version has undergone validity and reliability assessments.[55] Both mothers and fathers completed this inventory.

3. Assessment Tools for Children

3.1. Brief Infant and Toddler Social Emotional Assessment (BITSEA)-Turkish

The BITSEA was developed to assess the severity of psychiatric symptoms and psychosocial development issues in children aged 1-3 years.[56] This scale comprises 42 items, with 31 items assessing psychiatric problems and 11 items assessing psychosocial development. Each item is scored using 0 (not true/very rare), 1 (somewhat true/sometimes), or 2 (fairly true/frequently). Higher psychiatric problems scores indicate severe psychiatric problems, whereas higher psychosocial development scores signify better psychosocial development. The Turkish validity and reliability study of BITSEA was established by Karabekiroğlu et al.[57] with subsequent demonstration of its clinical validity.[58] Internal consistencies of the BITSEA–problem (P) and competence (C) scales were good to excellent (Cronbach's α=0.82 and 0.72, respectively). Interrater reliability between parents and test–retest reliability were both good. BITSEA/P scores were significantly correlated with Child Behavior Checklist internalizing, externalizing, and total problem scores ($p<0.001$).

3.2. Aberrant Behavior Checklist (ABC)-Community

The ABC[59] comprises 58 items and is scored on a Likert-type scale ranging from 0 to 3. It encompasses five subscales and a total score: (I) Irritability, agitation, and crying (15 items); (II) Lethargy and social withdrawal (16 items); (III) Stereotypic behaviors (7 items); (IV) Hyperactivity/non-compliance (16 items); and (V) Inappropriate speech (4 items). Clinical validation has been conducted for patients aged 1-4 years.[60] Internal consistency of the Turkish version of the ABC appeared to range from adequate to high. Cronbach's alpha values were as follows: irritability, 0.94; lethargy/social withdrawal, 0.92; stereotypic behavior, 0.87; hyperactivity, 0.65; and inappropriate speech, 0.87.

4. Tools for Assessing the Mother/Father-Child Relationship

4.1. PTI-MAXA

This study aims to investigate the clinical validity of the PTI-MAXA. The PTI-MAXA[51] was developed to assess mother-toddler/child interactions and later adapted for father-toddler interaction and its validity and reliability were reported.[52] The inter-rater reliability of PTI-MAXA scores ranged from good to excellent: mothers (rho=0.33, $p<0.05$), children (rho=0.55, $p<0.001$), and total (Spearman's rho=0.52, $p=0.001$). The internal consistency scores of PTI-MAXA were near-perfect (Cronbach's α scores: mother index =0.94, child index =0.95, total =0.94; control mother =0.94, control child index =0.92, control total =0.94).[51,52] The PTI-MAXA-mother scores were positively correlated with the child's Bayley mental and motor development scores and negatively correlated with the BITSEA problem scores.[51,52] Additionally, PTI-MAXA-child scores showed a significant correlation with BITSEA competence scores and Bayley mental development scores.[51,52] The PTI-MAXA provides reliable global ratings of mother-toddler and father-toddler interactions based on 40-50 minutes of videotaped play in a laboratory setting. Video recordings encompass five segments: free play, clean-up, questionnaire completion, structured play, and separation-reunion. Using a Likert-type scale (1=very poor to 5=highly adequate), two trained raters independently rated both the parents and the child on 10 items: physical involvement, affective expressiveness, pleasure, responsiveness, reciprocity, joint attention, non-intrusiveness, adaptive flexibility, support, and acceptance. In addition to the child total, parent total, and overall total scores, both parent and child are assigned three sub-scores each: involvement (items 1, 2, and 3), reciprocity (items 4, 5, and 6), flexibility-adaptation (items 7, 8, 9, and 10). The details that should be taken into consideration for each item during scoring and the details of the Marmara mother/father-toddler observation, which is recommended for the use of the PTI-MAXA, were presented in the previous article.[52] Parental permission for video recording is obtained in advance. This assessment comprises four parts: (1) free play, (2) questionnaire completion, (3) educational play, and (4) separation-reunion. The internal consistency scores , interpersonal correlations, and construct validity scores of the PTI-MAXA were significantly high for both mother-toddler and father-toddler dyads (both mothers and fathers; child and total scores). After receiver operating characteristic and assessment of sensitivity and specificity, a PTI-MAXA total score of 75 or higher was considered the cut-off point for "healthy" interaction.

Procedure

Parents were informed about the study, and their consent was obtained. The SCDF was completed, along with assessments such as the BSI and BDI for fathers and the BITSEA and ABC for children. Separate appointments were scheduled for mothers and fathers to complete the mother-infant/toddler observation (MITO), a structured assessment. MITO was recorded with a video camera. Two clinicians, blinded to the children's scale scores, independently scored the MITO, Child's Attachment Pattern, and Parent-Toddler Relationship Global Assessment Scale by reviewing the video recordings. Both coders were trained by the first author in scoring the scales to ensure consistency and accuracy. This investigation was approved by the Ondokuz Mayıs University Clinical Research Ethics Committee, with decision number 2019/424 and date 24.05.2019. The study was conducted following the Declaration of Helsinki.

Statistical Analysis

In this cross-sectional study, the Statistical Program for Social Sciences (SPSS) version 22.0 was used. Missing data (maximum

4% for each measurement) were imputed using multiple imputation in SPSS. All scores were determined to be normally distributed using the Kolmogorov-Smirnov test and histograms. Descriptive statistics were given as mean ± standard deviation or median (minimum-maximum) for continuous variables and frequency (percentage) for categorical variables according to the suitability of the data for normal distribution. Results are given with 95% confidence intervals. Analysis of variance (ANOVA) was used to compare scale scores between groups.

Chi-square (X^2) tests were used to compare categorical data, and Student's t, Mann-Whitney U, or Wilcoxon tests were used to compare continuous data. Correlations between scales were analyzed using parametric (Pearson) or non-parametric (Spearman) tests. The scores determined by the first coder were taken as the index scores for the PTI-MAXA. Validity measures included correct classification rate, sensitivity, specificity, positive predictive value, negative predictive value, detection rate, and area under the curve. p-values <0.05 were considered statistically significant. All values are reported as either percentage or mean ± standard deviation.

We performed multivariate ANOVA (MANOVAs) to examine the quality of interaction patterns between fathers and their children and between mothers and their children. For all MANOVA results, subsequent univariate analyses were performed on significant effects, and contrasts were evaluated using the Duncan test with Bonferroni correction. We also aimed to assess additional factors predicting higher PTI-MAXA scores. Therefore, we applied multiple regression models; potential predictors included gender, age, maternal and paternal BDI and BSI scores, maternal and paternal educational levels, and the presence of autism.

Results

A total of 11 centers, involving 105 children aged 13-40 months [mean: 27.28±6.7 months; (boys, n=63; girls, n=42)] and their mothers aged 22-46 years (mean: 31.5±4.7) and fathers aged 26-47 years (mean: 34.7±4.7) participated in the study. The participants' demographic and scale data are presented in Table 1.

The mothers had significantly higher BDI and BSI scores than fathers (Table 1). In addition, mothers scored their children's BITSEA-competence significantly higher than fathers did (Table 1).

The comparison of the mother-toddler and father-toddler PTI-MAXA scores is presented in Table 2. Toddlers participated significantly more in interactions with their mothers than with their fathers, and mothers had significantly higher reciprocity scores than fathers did (Table 2).

When the children were divided into two age groups, 13-24 months and above 24 months, no significant difference in PTI-MAXA scores was found between the groups. The variation in mother-toddler and father-toddler PTI-MAXA scores by the child's gender, birth order, and parental education level is presented in Table 3. Because boys have a higher likelihood of autism spectrum disorder (ASD) and this could affect PTI-MAXA scores, gender differences were analyzed in the non-ASD group. In mother-toddler interactions, girls scored significantly higher across all domains, whereas in father-toddler interactions, girls scored significantly higher than boys only in participation (Table 3). While the fathers' PTI-MAXA scores did not reveal significant gender differences in any of the sub-parameters, mothers had significantly higher participation scores in their interactions with daughters than with sons (Table 3). Although PTI-MAXA sub-scores and total scores were higher in first-born children, the differences were not significant (Table 3). On the other hand, as the education levels of both mothers and fathers increased, the PTI-MAXA subscores of their children were significantly higher (Table 3).

Table 4 also presents comparisons of PTI-MAXA scores by presence or absence of ASD and by diagnostic subgroup. As expected, children with ASD scored significantly lower in all subtests of the PTI-MAXA. Both mothers and fathers of children in the ASD group also scored significantly lower on all PTI-MAXA subscores (Table 4).

Significant differences were also found among psychiatric and developmental diagnostic subgroups. Mother-toddler PTI-MAXA (mother, child, and total) scores were significantly lower in those with ASD and cognitive developmental delay (CDD) than in those with language delay or no diagnosis (Table 4). In addition, father-toddler PTI-MAXA (father, child, and total) scores significantly differentiated those with ASD from those with CDD (Table 4). Tukey honestly significant difference tests showed that mother-toddler PTI-MAXA scores significantly differentiated the groups with no diagnosis and with language impairment only from the group with CDD and ASD. Father-toddler PTI-MAXA scores additionally discriminated between the CDD and ASD groups. The correlations of all scale scores with the PTI-MAXA scores are presented in Table 5. Almost all subscores of both mother-toddler and father-toddler PTI-MAXA showed a significant correlation with the child's ABC scores and BITSEA-competence subscores.

We conducted multiple regression analyses to identify cofactors predictive of higher PTI-MAXA scores. Means, standard deviations, and correlations are presented in Tables 6 and 7. Not all factors are presented in the tables, as some are highly and/or statistically significantly correlated with each other. The combination of variables presented significantly predicted the PTI-MAXA-total scores [mother: R^2=0.42, F(9,85)=8.63, p<0.001]. The adjusted R-squared value is 0.42. These results indicate that the model explained 42% of the variance in the total (mother-toddler) PTI-MAXA scores. In terms of mother-toddler interaction quality, the child's BITSEA competence score, gender, presence of autism, and age were the main predictors (Table 6). In terms of father-toddler interaction quality, the child's ABC total score and the presence of autism stood out as the main predictors [father: R^2=0.50, F(9,86)=11.53, p<0.001] (Table 7).

Table 1. Demographic data and scale scores		
Gender (boy/girl) (n)		63/42
Age of the child (months) (mean ± SD)		13-40 (27.7±6.7)
	Firstborn (n/%)	63/60.0
Is there sentence formation/speaking?	Yes (n/%)	74/70.5
Basic psychiatric diagnosis in the child	None (n/%)	57/54.2
	Autism spectrum disorder	22/21.0
	Language impairment	15/14.3
	Mental developmental delays	11/10.5
Age of the mother (years) (mean ± SD)		22-46 (31.5±4.8)
Maternal education (>12 years) (%)		(61.0%)
Does the mother work?	Yes (n/%)	49/46.7
Father's age (years) (mean ± SD)		26-47 (34.7±4.7)
Father's education (>12 years) (%)		(61.0%)
Maternal BDI [med (25-75%)]		**10 (5-15)**[*]
Father BDI [med (25-75%)]		**7 (3-12)**[*]
Maternal BSI [med (25-75%)]		**34 (17-75)**[**]
Father BSI [med (25-75%)]		**23 (13-44)**[**]
(Mother) BITSEA-problem (mean ± SD)		15.2±7.8
(Father) BITSEA-problem (mean ± SD)		15.3±8.6
(Mother) BITSEA-competence (mean ± SD)		**15.3±4.7**[***]
(Father) BITSEA-competence (mean ± SD)		**14.0±5.1**[***]
(Mother) ABC-total (mean ± SD)		24.6±20.8
(Father) ABC-total (mean ± SD)		24.9±22.8

Missing data were excluded. [*]p=0.004 (between mother and father scores) (Wilcoxon test), [**]p<0.001(between mother and father scores) (Wilcoxon test), [***]p=0.02 (between mother and father scores) (t-test), SD: Standard deviation, BDI: Beck Depression Inventory, BITSEA: Brief Infant and Toddler Social Emotional Assessment, BSI: Brief Symptom Inventory, ABC: Aberrant Behavior Checklist

Table 2. Comparison of PTI-MAXA-father and PTI-MAXA-mother scores				
(mean±sd)	**Mother**	**Child (with mother)**	**Father**	**Child (with father)**
1. Physical participation	**4.41±0.9**[a]	**4.21±0.9**[d]	**4.16±0.9**[a]	**3.96±1.1**[d]
2. Affective expressiveness	4.16±1.0	3.85±1.0	4.34±3.0	3.76±1.2
3. Pleasure	3.89±1.0	3.87±1.1	3.79±1.0	3.87±1.2
4. Responsiveness	4.31±0.8	3.80±1.1	4.15±0.9	3.78±1.2
5. Reciprocity	**4.10±0.9**[b]	3.64±1.1	**3.95±0.8**[b]	3.71±1.2
6. Joint attention	4.23±0.8	3.81±1.2	4.12±0.9	3.85±1.2
7. Non-intrusiveness	4.13±0.9	3.87±1.0	4.08±0.9	3.77±1.1
8. Adaptive flexibility	4.22±0.8	3.69±1.1	4.16±0.9	3.69±1.2
9. Support	4.30±0.9	3.67±1.2	4.24±0.8	3.68±1.2
10. Acceptance	4.36±0.8	3.91±1.1	4.27±0.9	3.83±1.2
Involvement	12.46±2.7	**11.92±2.8**[e]	12.30±3.7	**11.59±3.3**[e]
Reciprocity	**12.64±2.4**[c]	11.26±3.2	**12.23±2.3**[c]	11.34±3.5
Flexibility-adaptation	17.01±3.0	15.13±3.7	16.74±3.1	14.96±4.4
Total	42.11±7.5	38.31±9.3	41.27±7.7	37.90±10.7
PTI-MAXA-total	80.42±15.0		79.16±17.0	

[a]: p=0.007 (between mother and father scores) (Wilcoxon test), [b]: p=0.05 (between mother and father scores) (Wilcoxon test), [c]: p=0.03 (between mother and father scores) (Wilcoxon test), [d]: p=0.002 (child; between scores with mother and scores with father) (Wilcoxon test), [e]: p=0.024 (child; between scores with mother and scores with father) (Wilcoxon test), SD: Standard deviation, PTI-MAXA: Parent-Toddler Interaction Multiaxial Assessment Scale

Table 3. Variation of PTI-MAXA scores with child gender, birth order and parental education

	(mean ± sd)	Mother	Child (with mother)	Father	Child (with father)
Boy (No autism) (n=48)	Involvement	**12.31±2.6[a]**	**12.38±2.0[b]**	12.83±4.6	**12.25±2.7[g]**
	Reciprocity	12.88±2.3	**11.74±2.7[c]**	12.52±2.1	12.04±2.8
	Flexibility-adaptation	16.98±2.9	**15.40±3.1[d]**	16.96±2.8	15.69±3.9
	Total	42.17±7.1	**39.52±7.0[e]**	42.31±7.3	39.99±8.7
	PTI-MAXA-total	**81.69±12.3[f]**		82.29±14.6	
Girl (No autism) (n=35)	Involvement	**13.55±1.5[a]**	**13.55±2.0[b]**	12.60±2.0	**13.37±2.2[g]**
	Reciprocity	13.45±1.5	**13.03±2.2[c]**	13.06±1.6	13.23±2.0
	Flexibility-adaptation	18.09±1.9	**17.12±3.1[d]**	17.77±2.2	17.14±2.9
	Total	45.09±4.2	**43.70±6.6[e]**	43.43±5.1	43.74±6.6
	PTI-MAXA-total	**88.79±9.6[f]**		87.17±10.7	
First born	Total	43.26±6.7	39.64±8.6	42.43±7.2	39.46±10.0
	PTI-MAXA-total	82.93±13.6		81.89±15.6	
Not first	Total	40.5±8.3	36.49±9.9	39.52±8.1	35.55±11.4
	PTI-MAXA-total	77.00±16.2		75.07±18.3	
Parent education					
(More than 12 years)	Total	42.53±6.9	**39.85±8.8[h]**	41.89±6.3	**39.47±10.0[i]**
	PTI-MAXA-total	82.38±14.0		81.36±15.3	
(Less than 13 years)	Total	41.43±8.4	**35.81±8.7[h]**	40.29±9.5	**35.44±11.4[i]**
	PTI-MAXA-total	77.24±16.2		75.73±19.0	

[a]: p=0.05, [b]: p=0.003, [c]: p=0.023, [d]: p=0.009, [e]: p=0.004, [f]: p=0.007, [g]: p=0.029 (between genders) (Mann-Whitney U tests), [h]: p=0.03 (between mother education groups) (Mann-Whitney U tests), [i]: p=0.05 (between father education groups) (Mann-Whitney U tests), SD: Standard deviation, PTI-MAXA: Parent-Toddler Interaction Multiaxial Assessment Scale

Table 4. Variation of PTI-MAXA scores with the presence of autism spectrum disorder, language delay and cognitive developmental delay

	(mean ± sd)	Mother	Child (with mother)	Father	Child (with father)
ASD (+) (n=22)	Involvement	**11.14±3.5[a]**	**8.59±2.7[b]**	**10.64±2.9[a]**	**7.32±2.4[b]**
	Reciprocity	**10.95±2.8[b]**	**7.68±2.7[b]**	**10.27±2.7[b]**	**6.82±2.6[b]**
	Flexibility-adaptation	**15.45±3.9[a]**	**11.64±3.5[b]**	**14.64±4.1[c]**	**9.91±3.6[b]**
	Total	**37.55±9.7[b]**	**27.95±8.3[b]**	**35.55±9.4[b]**	**24.05±7.8[b]**
	PTI-MAXA-total	**65.45±15.6[b]**		**59.59±15.3[b]**	
ASD (-) (n=83)	Involvement	**12.85±2.3[a]**	**12.89±2.0[b]**	**12.73±3.7[a]**	**12.72±2.5[b]**
	Reciprocity	**13.13±2.0[b]**	**12.31±2.6[b]**	**12.75±1.9[b]**	**12.54±2.6[b]**
	Flexibility-adaptation	**17.47±2.5[a]**	**16.16±3.2[b]**	**17.30±2.6[c]**	**16.30±3.6[b]**
	Total	**43.45±6.1[b]**	**41.36±7.1[b]**	**42.78±6.4[b]**	**41.57±8.1[b]**
	PTI-MAXA-total	**84.81±11.7[b]**		**84.35±13.2[b]**	
Child diagnosis[d]					
(No diagnosis) (A)	Total	**44.11**	**43.08**	**44.23**	**43.42**
	PTI-MAXA-total	**87.17**		**87.55**	
(Language delay) (B)	Total	**46.20**	**42.88**	**41.13**	**40.47**
	PTI-MAXA-total	**87.30**		**81.60**	
(Cognitive development delayed) (C)	Total	**37.73**	**32.73**	**37.55**	**33.45**
	PTI-MAXA-total	**71.00**		**71.00**	
(ASD) (D)	Total	**37.55**	**27.91**	**35.55**	**24.05**
	PTI-MAXA-total	**65.45**		**59.59**	

[a]: p=0.03, [b]: p<0.001, [c]: p=0.23 (with or without autism) (Mann-Whitney U tests), [d]: p<0.001(between diagnosis groups) (Kruskal-Wallis tests), ASD: Autism spectrum disorder [mother in total: A-B>C-D, child (with mother) in total: A-B>C-D, mother-child in total: A-B>C-D, father in total: A>C-D, child (with father) total: A-B>C>D; father-child in total: A-B>C>D], sd: Standard deviation, PTI-MAXA: Parent-Toddler Interaction Multiaxial Assessment Scale

Table 5. Correlations of PTI-MAXA scores with other scale scores

	(Spearman's rho)	Mother	Child (with mother)	Father	Child (with father)
Mother/father BDI score	Involvement	NS	NS	NS	NS
	Reciprocity	NS	NS	NS	NS
	Flexibility-adaptation	NS	NS	NS	NS
	Total	NS	NS	NS	NS
	PTI-MAXA-total	NS		NS	
Mother/father BSI-total score	Involvement	NS	NS	NS	NS
	Reciprocity	NS	NS	NS	NS
	Flexibility-adaptation	NS	NS	NS	NS
	Total	NS	NS	NS	NS
	PTI-MAXA-total	NS		NS	
BITSEA problem score	Involvement	NS	NS	NS	NS
	Reciprocity	NS	**-0.20***	NS	NS
	Flexibility-adaptation	NS	**-0.33****	**-0.21***	NS
	Total	NS	**-0.25***	NS	NS
	PTI-MAXA-total	**-0.26***		**-0.22***	
BITSEA competence score	Involvement	**0.26***	**0.48*****	**0.24***	**0.47*****
	Reciprocity	**0.28****	**0.57*****	**0.34****	**0.52*****
	Flexibility-adaptation	**0.23***	**0.48*****	**0.30****	**0.48*****
	Total	**0.28****	**0.53*****	**0.33****	**0.51*****
	PTI-MAXA-total	**0.48*****		**0.48*****	
ABC total score	Involvement	NS	**-0.27****	NS	**-0.33****
	Reciprocity	**-0.25***	**-0.37*****	**-0.21***	**-0.34****
	Flexibility-adaptation	NS	**-0.40*****	**-0.28****	**-0.40*****
	Total	**-0.22***	**-0.38*****	**-0.24***	**-0.37*****
	PTI-MAXA-total	**-0.35*****		**-0.36*****	

NS: Non-significant, *p<0.05, **p<0.01, ***p<0.001, BDI: Beck Depression Inventory, BITSEA: Brief Infant and Toddler Social Emotional Assessment, BSI: Brief Symptom Inventory, ABC: Aberrant Behavior Checklist, PTI-MAXA: Parent-Toddler Interaction Multiaxial Assessment Scale

Table 6. Simultaneous multiple regression analysis predicting mother-toddler PTI-MAXA total score (n=94)

Variable	B	SEB	β	Sig.
Gender of the child	-5.56	2.50	-0.18	0.029*
Age of the child	0.45	0.19	0.20	0.019*
Presence of ASD	-11.50	3.38	-0.32	0.001**
BITSEA-competence score	0.83	0.38	0.26	0.030*
Constant	79.92	11.9		0.000

R^2=0.42, F(9,85)=8.63, p<0.001, *p<0.05, **p<0.01, Sig: Significance, ASD: Autism spectrum disorder, PTI-MAXA: Parent-Toddler Interaction Multiaxial Assessment Scale, BITSEA: Brief Infant and Toddler Social Emotional Assessment, SEB: Standard error of B

Table 7. Simultaneous multiple regression analysis predicting father-toddler PTI-MAXA total score (n=95)

Variable	B	SEB	β	Sig.
Presence of ASD	-14.84	2.09	-0.58	0.000**
ABC total score	-0.11	0.04	-0.23	0.015*
Constant	48.13	7.29		0.000

R^2=0.50, F(9,86)=11.53, p<0.001, *p<0.05, **p<0.01, Sig: Significance, ASD: Autism spectrum disorder, ABC: Autism Behavior Checklist, PTI-MAXA: Parent-Toddler Interaction Multiaxial Assessment Scale, SEB: Standard error of B

Discussion

We aimed to examine the distinctive characteristics of PTI-MAXA in terms of psychiatric morbidity. In addition, we aimed to assess differences in dimensions of interaction between mother-toddler and father-toddler dyads. To the best of our knowledge, this study represents the first attempt to systematically evaluate and score both the father-toddler and the mother-toddler relationships in a laboratory setting using a multi-axis approach. Furthermore, previous studies and assessment tools to date have not adequately addressed, using clinical data, the elements comprising mother-toddler and father-toddler interaction content or the scoring of different interaction dimensions. In this study, we present the clinical validity —in other words, the clinical usefulness in psychiatry— of the PTI-MAXA, which enables scoring of mother-toddler and father-toddler interactions.

Validity and reliability data for mothers and fathers have been presented previously.[51,52] The Play Scale consists of 32 items (24 parent items and 8 child items). This methodology, at that scale, bears some similarities to that of the PTI-MAXA. Considering all the data, the PTI-MAXA has several advantages over other assessment methods currently used for similar purposes. In addition to the total scores, PTI-MAXA provides sub-scores for fathers and children and for involvement, reciprocity, and flexibility and adaptation, allowing for the assessment of the underlying elements of parent-child interaction and relationship. The standardized approach proposed for the PTI-MAXA assessment has also been highly beneficial for both PTI-MAXA scoring and observing the mother/father-toddler dyad in detail. This approach also enables the evaluation of children's attachment patterns.

This study also examined differences in mother-toddler and father-toddler interactions. Although mothers reported higher BDI and BSI scores, they demonstrated significantly greater interaction with their children. This may reflect a compensatory caregiving pattern, in which psychological distress coexists with heightened relational investment. The overlap between mother-child play and father-child play is likely greater than the differences across many cultures.[18] However, a review of the evidence to date suggests that fathers' play is often more physical than mothers' play and may have important effects on children's self-regulation skills.[32] Our findings indicate that mothers exhibit significantly higher levels of involvement and reciprocity in interactions with their 1-3-year-old children than fathers do, and that children also show significantly greater involvement with their mothers than with their fathers. Numerous studies highlight differences between mothers and fathers in the relationships between parenting and children's emotion regulation, with many showing more robust connections between fathers' behavior and children's emotion regulation than mothers' behavior.[23] For instance, one study found that emotional support and enjoyment of children's autonomy in father-child interactions, but not in mother-child interactions, was associated with better emotion regulation in toddlers.[35] Another study reported that emotional availability of both mothers and fathers during a teaching task was associated with more effortful attention in toddlers, but fathers' parenting was also associated with more positive affect in the toddler.[61] In contrast, some studies found stronger effects for mothers than for fathers. For example, mothers were found to be more emotionally available than fathers,[61] mothers exhibited more positive and less negative parenting compared fathers,[62] mother-child interactions were of higher quality than father-child interactions,[19] and mothers had higher levels of responsiveness.[63,64] While there are studies assessing the quality of fathers' parenting through observational measures, few include observations of both mothers' and fathers' interactions with their children. Nevertheless, the use of dyadic analyses allows for the examination of all data in a single analysis, accounting for the dyad in analyses, and directly measuring the independence of dyad members.[23]

An increasing number of studies have outlined pathways to father involvement, such as fathers' education, occupation, beliefs, and motivations in their role. For instance, more educated fathers engage in direct interaction with their children to a greater extent.[65,66] Our data revealed that, as both mothers' and fathers' education levels decreased, PTI-MAXA-total and PTI-MAXA-parent subscores did not change, while PTI-MAXA-child subscores decreased significantly. In this study, the child's gender was also found to directly affect the quality of parent-child interaction. Because ASD is more prevalent in males, an analysis excluding the ASD group revealed that boys had lower PTI-MAXA scores than girls for each sub-parameter, particularly in their interactions with their mothers. Regarding interaction with the father, only the participation subscores were lower in boys than in girls (Table 3). Our data provide strong evidence of significant gender differences in the quality of interaction between children aged 1-3 years and their parents. Some previous studies have also indicated that fathers tend to treat boys and girls differently.[67,68] Fathers of young children are more sensitive to their daughters' submissive emotional facial expressions[69] and are more likely to show greater attention and express more warmth in their daughters' prosocial behaviors.[70] It should also be noted that when evaluating the role of gender in these interactions, it should not be forgotten that cultural influences may also play a role.[71,72] In a study conducted in our country, an association was found between the diagnosis and severity of depression in mothers of children aged 1-3 years and the internalizing, externalizing, and total psychiatric problem levels in girls. Additionally, a significant relationship was identified between the diagnosis and severity of depression in fathers and externalizing problem levels in boys.[73]

In this study, when parents with children aged 1-3 years were compared, mothers exhibited significantly higher levels of psychopathology than fathers, as reflected by depressive symptoms and overall psychiatric symptom distribution. the rate of mothers diagnosed with depression during interviews was found to be 23.6%, while in fathers, it was 9.5%.[73] These rates are consistent with the results of studies indicating that the prevalence of depression in women is 2-3 times more

frequent than in men.[74] Our regression analyses showed that parental depressive symptoms or psychological symptom levels did not predict PTI-MAXA total scores. On the other hand, it was observed that the child's levels of psychiatric problems and general developmental problems disrupted the quality of the parent-toddler interaction.

Study Limitations

This study has several limitations. For instance, the qualitative aspects of parent-child interaction were not systematically identified when determining the items of the PTI-MAXA. A more detailed scoring could have been performed, followed by a systematic reduction of the number of items through factor analyses. However, because scoring and distinguishing highly similar expressions can be confusing, the aim during the development of PTI-MAXA was to identify items as independently as possible of one another. Future research may utilize more complex statistical analyses and determine, in modeling, which variables moderate or mediate the quality of parent-child interaction. Future studies may benefit from more complex statistical analyses and modeling to determine which variables govern or mediate the quality of parent-child interaction. In subsequent studies, much larger sample sizes can be used to identify relationships between all sub-scores of PTI-MAXA and various psychopathologies in parents or children. On the other hand, considering the possibility that parenting behaviors include socio-cultural differences,[18,71,72] it would also be appropriate to examine the possible influence of cultural processes on the PTI-MAXA assessment. Further research could include the temperament characteristics of children and the attachment patterns of both children and parents.

In this study, parents with children aged 1-3 years showed differences in involvement and reciprocity in their interactions with their children. The quality of parent-child interaction varied significantly with the presence of a clinical psychiatric or developmental diagnosis in the child, especially ASD, but not in the parent. Additionally, gender was found to be a significant variable in this age group, independent of the presence of a clinical diagnosis. Furthermore, the educational levels of the mother and father were also found to be associated with impaired interactional quality in the child.

Conclusion

All findings obtained in this study support the validity and reliability of the PTI-MAXA for assessing mother/father-child interaction and suggest that its use in clinical samples may be highly beneficial. The PTI-MAXA provides reliable global ratings of parent-toddler interactions during a 40-50-minute videotaped play session in a laboratory setting. In future studies, many clinical (e.g., child's developmental problems, psychiatric diagnosis, among others) or socioeconomic factors (e.g., child's gender, parents' age and education level, among others) that predict the global quality and subcomponents of these interactions can be examined using multidimensional regression analyses. Longitudinal study designs could explore whether the sub-dimensions of the parent-toddler interaction assessed by the PTI-MAXA in children aged 1-3 years predict future psychopathologies. Interaction-based parent education models could be developed based on objective observational data. The PTI-MAXA is a highly useful tool for assessing parent-child relationships in psychiatry, pediatrics, and child development clinics. It is also designed to be a highly effective method for identifying the quality of interactions and problem areas for parents, and for providing feedback. The findings of this study indicate that it can serve as a valuable tool in clinical practice in the field of neurodevelopmental disorders. Future research, such as studies examining long-term validity or applications in different cultural contexts, would be appropriate.

Ethics

Ethics Committee Approval: This investigation was approved by the Ondokuz Mayıs University Clinical Research Ethics Committee, with decision number 2019/424 and date 24.05.2019.

Informed Consent: Parents were informed about the study, and their consent was obtained.

Footnotes

Authorship Contributions

Concept: K.K., Design: K.K., Data Collection or Processing: K.K., E.Y., H.A., M.D., A.C., B.Ş., Y.T.T., G.Y.T., C.Ç.O., B.S.Ö., B.Ö.A., O.G., H.S.S., H.A.T., E.P.Y., H.Ö., D.E., Y.Y.G., M.B.U., M.Ç.U., Ş.Y.S., D.Ö., B.G.Ç., A.D.U.Ç., B.Ç., H.G., B.A.S., Analysis or Interpretation: K.K., Literature Search: K.K., Writing: K.K., E.Y., H.A., M.D., A.C., B.Ş., Y.T.T., G.Y.T., C.Ç.O., B.S.Ö., B.Ö.A., O.G., H.S.S., H.A.T., E.P.Y., H.Ö., D.E., Y.Y.G., M.B.U., M.Ç.U., Ş.Y.S., D.Ö., B.G.Ç., A.D.U.Ç., B.Ç., H.G., B.A.S.

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Is Whole Exome Sequencing (WES) Sufficient to Elucidate the Genetic Aetiology of Primary Enuresis Nocturna: The First Molecular-Based Large Family Study and a Brief Literature Review

Tüm Ekzom Dizileme (WES), Primer Enürezis Nokturna'nın Genetik Etiyolojisini Aydınlatmak için Yeterli Midir: İlk Moleküler Temelli Geniş Aile Çalışması ve Kısa Bir Literatür Derlemesi

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ABSTRACT

Objectives: Enuresis nocturna is a condition that negatively affects quality of life in childhood and adulthood. Primary enuresis nocturna (PEN) is a condition in which bedwetting continues after the age of five without a dry period. PEN is called non-monosymptomatic (PNMEN) when lower urinary tract findings are present and monosymptomatic (PMEN) when they are absent. Studies on the etiology of PEN, the 4p, 8q, 12q, 13q, 22q chromosomal regions, *GNAZ, DRD5, D1B, NOS1, DRD4, PRDM13, SIM1, EDNRB, AQP2* genes, rs9376454, rs60721117 variants have been proposed as genetic responsible. Here, it is aimed to clarify the genetics of enuresis by analysing the sociodemographic and genetic findings of a large family with PEN.

Materials and Methods: Detailed anamnesis of the family was taken, physical examinations, ultrasonography, voiding cystourography were examined and enuresis was subtyped. Whole exome sequencing was performed in six individuals with familial segregation, the variants found in these individuals were screened in seven other individuals with PEN.

Results: In our family, PEN was inherited in an autosomal dominant pattern. Six individuals had PMEN, seven individuals had PNMEN. Bladder dysfunction was in three individuals, sleep disorder was in all individuals. Common variants were found in *PIGQ, CLCNKB, NCOR1, MROH2A, CCDC140* genes which may be candidates in the first group, only the c.568_571delinsTGAA (p.Arg190_Glu191delinsTer) variant in *NCOR1* gene was found to be heterozygous in other family members.

Conclusion: When the sociodemographic characteristics of the family were examined, bladder dysfunction and sleep disorder are the main predisposing factors for PEN. Familial PEN cases are rare and whole exome and genome studies to investigate the molecular basis of multifactorial diseases such as PEN are rarely performed. In order to clarify candidate genes in whole genome and exome studies of new PEN cases, it would be a more effective method to perform whole genome or exome studies on independent familial PEN cases.

Keywords: Familial, enuresis nocturna, whole exome sequencing, genetics, incontinence

ÖZ

Amaç: Enürezis nokturna çocukluk ve yetişkinlik döneminde yaşam kalitesini olumsuz etkileyen bir durumdur. Primer enürezis noktürn (PEN), beş yaşından sonra kuru bir dönem olmaksızın yatak ıslatmanın devam ettiği bir durumdur. PEN, alt üriner semptomlar eşlik ettiğinde PEN non-monosemptomatik (PNMEN), eşlik etmediğinde monosemptomatik (PMEN) olarak adlandırılmaktadır. PEN'in etiyolojisi üzerine yapılan çalışmalarda 4p, 8q, 12q, 13q, 22q kromozomal bölgeleri, *GNAZ, DRD5, D1B, NOS1, DRD4, PRDM13, SIM1, EDNRB, AQP2* genleri, rs9376454, rs60721117 varyantları genetik sorumlu olarak öne sürülmüştür. Burada PEN geniş bir ailenin sosyodemografik ve genetik bulguları incelenerek enürezis genetiğinin açıklığa kavuşturulması amaçlanmaktadır.

Gereç ve Yöntem: Ailenin ayrıntılı anamnezi alınmış, fiziksel muayeneleri, ultrasonografi ve voiding sistourografileri incelenmiş ve enürezisin alt tiplendirmesi yapılmıştır. Ailevi segregasyonu gösterilen altı bireyde tüm ekzom dizilemesi yapılmış ve bu bireylerde bulunan varyantlar ailenin PEN'li diğer yedi bireyinde taranmıştır.

Bulgular: Ailemizde tanısını koyduğumuz PEN'in, otozomal dominant geçişli bir durum olduğu, altı bireyin PMEN, yedi bireyin PNMEN ile uyumlu olduğu görülmüştür. Mesane disfonksiyonu üç kişide, uyku bozukluğu ise tüm kişilerde görülmüştür. Birinci grupta aday olabilecek

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ÖZ

PIGQ, CLCNKB, NCOR1, MROH2A, CCDC140 genlerinde ortak varyantlar saptanmış olup sadece *NCOR1* genindeki c.568_571delinsTGAA (p.Arg190_Glu191delinsTer) varyantı diğer aile bireylerinde heterozigot olarak bulunmuştur.

Sonuç: Sosyodemografik özelliklerine bakıldığında, PEN etiyolojisinde sorumlu bulunan mesane disfonksiyonu ve uyku bozukluğu ailedeki başlıca hazırlayıcı faktörledir. Ailesel PEN olguları nadirdir ve PEN gibi multifaktöriyel hastalıkların moleküler temelini araştırmak için tüm ekzom ve genom çalışmaları nadiren yapılmaktadır. Yeni PEN olgularının tüm genom ve ekzom çalışmalarında aday genleri netleştirmek için bağımsız ailesel PEN olgularında tüm genom veya ekzom çalışmaları yapmak daha etkili bir yöntem olacaktır.

Anahtar Kelimeler: Ailevi, enürezis noktürn, tüm ekzom dizileme, genetik, inkontinans

Introduction

The term "enuresis nocturna" denotes recurrent involuntary leakage of urine during sleep at least twice a week for at least three months in children older than five years of age without any organic cause according to International Children's Continence Society guidelines.[1] Enuresis nocturna is divided into primary and secondary subgroups. Primary enuresis nocturna (PEN) is defined as the continuation of urinary incontinence during sleep without a dry period, at the age of five years and above, when bladder control is expected to have developed without underlying lower urinary tract pathology,[2] accounts for 80-90% of all enuresis cases.[3] Enuresis is one of the most common childhood disorders, the worldwide prevalence of PEN ranges from 3.1 to 24.4%[4] and has been found to be 10.5-17.5% in Türkiye.[5]

Enuresis is more common in boys than girls in the early school years, the ratio of affected men and women is stated to be 17:22[6] and continues in adulthood with a rate of 2-3%.[7] PEN is divided into monosymptomatic (PMEN) and non-monosymptomatic (polysymptomatic) (PNMEN) subgroups. PMEN is a condition not accompanied by lower urinary tract pathology and symptoms.[8]

Although many experts have proposed many hypotheses about the causes of enuresis, the aetiology of enuresis nocturna has not been clearly clarified. According to Isola[9] when enuresis nocturna does not represent an epileptic attack, it corresponds to an pollution.

Since the 1950s, when enuresis was thought to be caused by the inability of the muscles to relax, there have been many views that enuretics have a smaller bladder capacity.[10] A molecular link has been demonstrated between the circadian rhythm gene *Per1* and *ENaC*, an epithelial sodium channel in the collecting duct, suggesting that circadian rhythm plays a direct role in diuresis and sodium retention.[11] Nevéus[12] examined the interconnections of three systems involved in urinary control, including nocturnal urine production, bladder storage ability, and arousal threshold.

In the genetics of enuresis nocturna, which has been investigated since 1930s, autosomal dominant inheritance model has been accepted rather than autosomal recessive inheritance model.[13-15] Twin studies gave equal results regarding inheritance from mother or father but; the risk of enuresis nocturna was found to be 3.63 times for maternal inheritance and 1.85 times for paternal inheritance.[16]

Eiberg et al.[6] showed a strong connection between PMEN and D13S291, D73S263 markers in the 13q13-q14.3 chromosome regions. Linkage studies showed the existence of a other locuses for PEN on chromosome 12q13-21[13] and 8q (D8S264).[17] In the study of von Gontard et al.,[18] it was found that 8q (D8S260, D8S257), 12q (D12S80, D12S43), 13q (D13S263, D13S291) chromosome regions were segregated together in families with enuresis. In the genome scanning analysis conducted by Eiberg[19] in 1998 on a family with primary nocturnal enuresis, the candidate region was detected on chromosome 22 (D22S446, D22S343 markers), and the *GNAZ* gene might be a candidate gene for PMEN. von Gontard et al.[20] investigated the linkage of nocturnal enuresis to a locus on chromosome 22 in thirty-five German families and showed that 39.3% of the families were compatible with markers on chromosome 22. In another linkage study by Eiberg et al.,[21] the 4p16.1 region and *DRD5, D1B* genes were thought to be candidate genes for enuresis. In the Loeys et al.'s[22] study on these three loci, thirty-two families with enuresis/incontinence were included, found linkage with chromosome 22q11 in nine families, 13q13-14 in six families and 12q in four families, but no evidence of chromosome 8q was detected. In a study conducted to previously identified loci, chromosomes 12 and 13 of four large families with ten individuals with nocturnal enuresis were genotyped, there was no evidence for linkage to two previously reported loci.[23] The frequency of the C allele in the *DRD4* promoter (-616; rs747302) was found significantly higher in PEN patients.[24] The children with enuresis, carrying the *C* allele in their *DRD4* promoter, had reduced gray matter volumes in their thalamus.[25] The genome-wide association study by Jørgensen et al.[26] identified two loci and risk genes associated with nocturnal enuresis, including *PRDM13, SIM1* and *EDNRB*, could affect sleep, urine production, bladder function, found a significant genetic overlap between nocturnal enuresis and attention deficit hyperactivity disorder, so they detected two candidate variants; rs9376454 (chromosome 6q16.2) and rs60721117 (chromosome 13q22.3) to be leading. A recent genetic study of treatment-resistant PEN cases, has drawn attention to the link between the *AQP2* gene and enuresis.[15]

In this study, it is aimed to elucidate the genetic mechanisms causing enuresis nocturna by genetic analysis of individuals with enuresis nocturna from a family with three generations of isolated enuresis nocturna cases.

Materials and Methods

The study included thirteen individuals with PEN from the same family who were referred to clarify their bedwetting history. When questioning the histories of enuresis nocturna,

the definition of enuresis nocturna in the International Cildren's Continens Society criteria was used.[1] It was learned that six members of the family were followed-up in urology and child psychiatry outpatient clinics. In the history of all symptomatic individuals, time of bedwetting during the day, age at onset and end of symptoms, frequency of wetting during the week and night, constipation, faecal incontinence, drinking water, frequency of urination, difficulty in urination, difficulty in urinary retention, frequency of daily voiding, presence of urinary flow disorder, depth of sleep and characteristics of sleep, history of birth trauma, allergy and parasitic diseases, history of head or pelvic trauma, history of urinary tract infection were questioned. Weight, height, external urinary system examinations were performed by physical examination and the results were recorded. Haemogram, biochemistry, complete urinalysis and urinary system ultrasonography were performed and signs of additional diseases were roughly excluded. Six individuals of the family who were followed up and treated were divided into Group 1 and the remaining seven individuals were divided into Group 2.

Whole exome sequencing (WES) allows the examination of all protein coding sequences (exons), some non-coding sequences (introns) and exon-intron junction regions of defined genes in the entire DNA sequence. When the exact disease-causing gene of a particular condition is not known, the examination of the entire DNA sequence is also used to search for candidate genes for the disease with the deductive method. For clarification of the genetic etiology of enuresis nocturna, venous blood samples of all individuals were collected in 4 mL ethylenediaminetetraacetic acid tubes in order to perform WES. DNA isolation was performed using QIAamp DNA Micro Kit[â]. Standard exome enrichment and library preparation of Group 1 were performed and the library was sequenced on the Illumina HiSeq 4000 with 2x150 bp paired-end sequencing at 50-100X target depth.

Statistical Analysis

All variants were mapped to the human reference genome hg19, those that passed the quality filters were checked on Integrative Genomics Viewer (IGV, https://igv.org/), then low frequency variants according to GnomAD v.4.1.0 (https://gnomad.broadinstitute.org/about) were analyzed using Microsoft Excel filtering. Pseudogenes were eliminated. In silico pathogenicity prediction tools and American Collage of Medical Genetics (ACMG) guidelines were used for variant selection. The variants obtained as a result of WES analysis of Group 1 individuals were filtered for the Human Phenotype Ontology (HPO) genes responsible for the mechanisms accused in the pathophysiology of enuresis nocturne. Rare variants with high pathogenicity and low community frequency detected in Group 1 were analysed in DNA samples isolated from Group 2 individuals by primer design [ENSEMBL-BLAST database (https://www.ensembl.org/Homo_sapiens/Tools/Blast) was used] in Mi-Seq Illumina Next Generation Sequencing device (Illumina Inc., San Diego, CA, USA). Approval certificate dated 30.01.2019 and numbered 20.478.486 was obtained from Manisa Celal Bayar University Faculty of Medicine Health Board Ethics Committee for this study.

Results

Two brothers aged 11 and 14 years with enuresis nocturna and their father who had a history of enuresis in the past were consulted to the department of medical genetics and the pedigree of the family was initially analysed and thirteen individuals had a history of enuresis nocturna in the past. When the inheritance pattern in the pedigree was examined, it was learnt that there was no consanguineous marriage (or same village) between the parents of individuals with a history of enuresis nocturna. It was found that enuresis nocturna was inherited without skipping generations including the father of the proband, his father's siblings and his father's father. Since the ancestral individuals I-1, I-2, who are the ancestors of the inheritance, are currently not alive, no information about their enuresis nocturna history could be obtained. It was learnt that II-3, the mother of III-10 who had a history of enuresis nocturna, could not remember the history of enuresis nocturna. Looking at the general distribution of the pedigree, enuresis nocturna; is not inherited from a particular sex, but is passed on from both mother and father to their children, not inherited to a particular sex, but occurs in both boys and girls. The left part of the pedigree clearly shows vertical inheritance (no generation skipping). The affected male/female ratio was calculated as 8/5 (1.6). As detailed in Table 1, the age of onset of symptoms was questioned to differentiate primary and secondary enuresis nocturna and it was found that the symptoms of all family members continued from birth without a dry period and the mean age at the end was 9.7 years. The complaint of all members of the family is nocturnal, IV-6, IV-7 and III-14 individuals have intermittent daytime incontinence as well as enuresis nocturna. All members of the family have enuresis at least three nights a week. Bedwetting was observed at least one and at most three times in all members of the family on nights when enuresis was observed. None of the family members have complaints of drinking too much water or urinating frequently. Urinary retention manoeuvres (squatting/crossing) were observed in six individuals (IV-6, IV-7, III-10, IV-10, IV-11, III-14). Changes in walking were observed in two individuals (III-10 and IV-10). When the laboratory and imaging results were analysed, the urinary system ultrasonography of IV-11 showed Grade 1 ectasia of both renal pelvic-caliceal system and a post-mictional residual urine volume of 20 cc was measured in the urinary system ultrasonography of IV-6 individual. Among the three individuals whose bladder volume was measured by ultrasonography, the prevoid bladder volume of IV-7 individual was 144 cc (expected bladder volume according to Hjalmas formula was 360 cc) and the prevoid bladder volume of IV-12 individual was 50 cc (expected bladder volume according to Hjalmas formula was 300 cc).[27]

Table 1. Anamnesis findings of individuals

Symptoms	III-5	IV-6	IV-7	III-10	IV-10	IV-11	II-1	III-1	III-4	III-7	II-5	III-14	IV-12
Age (year)	42	14	11	48	20	17	75	50	45	40	61	37	13
Gender	Male	Male	Male	Female	Male	Female	Male	Male	Female	Male	Female	Male	Female
Time of bedwetting	Night	Night and day	Night and day	Night	Night	Night	Night	Night	Night	Night	Night	Night and day	Night
Start time	From birth	From birth	From birth	From birth	From birth	From birth	From birth	From birth	From birth	From birth	From birth	From birth	From birth
End time	7 years	Continuing	Continuing	9 years	9 years	8 years	10 years	8 years	8 years	8 years	11 years	13 years	11 years
Frequency of wetting (days/week)	3-4 nights/week	Every night	3-4 nights/ week	3-4 nights/ month	Every night	Every night	3 nights/ week	3-4 nights/ week	3 nights/ week	3-4 nights/ week	4-5 nights/ week	3-4 nights/ week	3-4 nights/week
Frequency of bed-wetting during the night	1 time	<3 times	<3 times	2 times	1 time	<3 times	1 time	1 time	1 time	1 time	1 time	1 time	<2 times
History of constipation	None	None	None	Yes	None	Yes	None	None	None	None	None	None	Yes
History of faecal incontinence	None	Yes	None	None	Yes	None	None	None	None	None	None	Yes	None
History of drinking too much water	None	None	None	None	None	None	None	None	None	None	None	None	None
Frequent urination	None	None	None	None	None	None	None	None	None	None	None	None	None
Daily frequency of urination	Every 3 hours	Every 2 hours	Every 2 hours	Every 2 hours	Every 2 hours	Every 3-4 hours	Every 2-3 hours	Every 3-4 hours	Every 2-3 hours	Every 2-3 hours	Every 2-3 hours	Every 2 hours	Every 2 hours
History of burning during urination	None	None	None	Yes	Yes	Yes	None	None	None	None	Yes	None	None
Urinary retention and/or difficulty while holding urine (squatting-crossing)	None	Yes	Yes	Yes	Yes	Yes	None	None	None	None	None	Yes (squatting)	None
History of urgent urination	None	Yes	None	Yes	None	Yes	None	None	None	None	None	None	Yes
Disturbance in urine flow	None	None	None	Yes (drop by drop)	None	Yes (discrete)	None	None	None	None	None	None	None
History of gait changes	None	None	None	Yes	Yes	None	None	None	None	None	None	None	None
Difficult awakening from sleep	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Snoring in sleep	None	None	None	Yes	None	None	None	None	None	None	None	None	Yes
History of sleep terrors	Yes	None	None	None	None	None	Yes	Yes	Yes	Yes	Yes	None	Yes
History of low birth weight	None	None	None	None	None	None	None	None	None	None	None	None	None
History of birth trauma	None	None	None	None	None	None	None	None	None	None	None	None	None
Food allergy	None	None	None	None	None	None	None	None	None	None	None	None	None
History of parasites	None	None	None	Yes	None	None	None	None	Yes	None	None	None	None
History of head trauma	None	None	None	None	None	None	None	None	None	None	None	None	None
History of pelvic trauma	None	None	None	None	None	None	None	None	None	None	None	None	None
History of recurrent urinary tract infection	None	None	None	None	None	Yes	None	None	None	None	None	None	None
History of recurrent urinary tract infection	None	None	None	None	None	None	None	None	None	None	None	None	None
Obesity	None	None	None	None	None	None	None	None	None	None	None	None	None
Treatments received	No treatment	Combined therapy	Combined therapy	No treatment	Combined therapy	Combined therapy	No treatment	No treatment	No treatment	No treatment	No treatment	No treatment	Regression with education and advice
History of psychosocial problems/psychological support	None	Yes	Yes	Yes	Yes	Yes	None	None	None	None	None	Yes	None
Socioeconomic and cultural level of the family	Low	Middle	Middle	Low	Middle	Middle	Low	Low	Low	Low	Low	Low	Middle
Behavioural disorder/attention deficit	None	None	Yes	None	Yes	None	None	None	None	None	None	None	None

All individuals described difficulty being awakened by high-frequency sounds and stimuli, but did not report any abnormalities in falling asleep and sleep duration (7-10 hours). Seven individuals described a history of sleep terrors (nightmare, fearful dream) (II-1, II-5, III-1, III-4, III-5, III-7, IV-12). None of the individuals had sleep apnoea. As shown on Figure 1 the findings of II-1, II-5, III-1, III-4, III-5, III-7 members of the family were compatible with PMEN; the findings of III-10, III-14, IV-6, IV-7, IV-10, IV-11 and IV-12 members were compatible with PNMEN.

Four members of the family received pharmacological and supportive treatments for enuresis nocturna. IV-6 was treated with desmopressin and reward therapy and it was observed that the number of wet nights in six months decreased from 56 to 2, after these treatments. IV-7 was treated with desmopressin and reward and punishment (restriction) therapies; it was observed that the number of wet nights in a month decreased from 28 to 2. IV-10 and IV-11 were treated with desmopressin and behavioural therapy together and benefited.

After anamnesis and detailed examination, genetic examination of blood samples was started. In each individual's exome data, firstly, exonic, exonic; splicing, intergenic, downstream, upstream, UTR3, UTR5, coding ribonucleic acid variants were selected in the functional reference gene filter. As a result of the analysis of six individuals who underwent WES variants with an allele fraction above 30%, read quality above 20% (exceeding 20X) in all individuals, considering the prevalence of enuresis nocturna, allele frequency below 18% were filtered. 15927 common variants in 9102 genes that met the ACMG criteria were obtained.

Based on the decreased prevoid bladder volume in two of the family members (IV-7,IV-12) and IV-6 individual's postmixed residual urine volume, the following findings related to overactive bladder in HPO; urinary urgency (HP:0000012), functional abnormality of the bladder (HP:0000009), urinary bladder sphincter dysfunction (HP:0002839), autonomic bladder dysfunction (HP:0005341), spastic/hyperactive bladder (HP:0005340), urinary incontinence (HP:0000020) subgroups, a total of 739 genes were filtered. Three common variants in *GALC, PIGQ*, and *CLCNKB* genes, not classified as benign/likely benign in the Clinvar database and with a gnomAD population frequency below 1% were found. As shown in Table 2, when the tissue expression distributions of the exons in which the variants were detected were analysed, it was observed that exon 17 in the *GALC* gene in which the variant was located was not expressed in any tissue. The exons of the variants in *CLCNKB* and *PIGQ* genes showed moderate expression in the renal medulla and cortex.

Based on the anamnesis of "deep sleep and difficulty in awakening" of all members and "sleep terror" of seven members, sleep disorders in HPO are defined as sleep-wake cycle disturbance (HP:0006979), disturbance during transitions between sleep and wake states (HP:5200293), sleep abnormality (HP: 0002360), abnormal sleep architecture (HP:5200298), sleep-wake inversion (HP:0031849), nocturnal seizures (HP:0031951), parasomnia (HP:0025234), hypersomnia (HP:0100786), sleep-wake cycle disturbance (HP:0006979), sleep terror (HP:0030765), somnambulism (HP:0025236) subgroups in total 747 genes were filtered, 4 missense rare

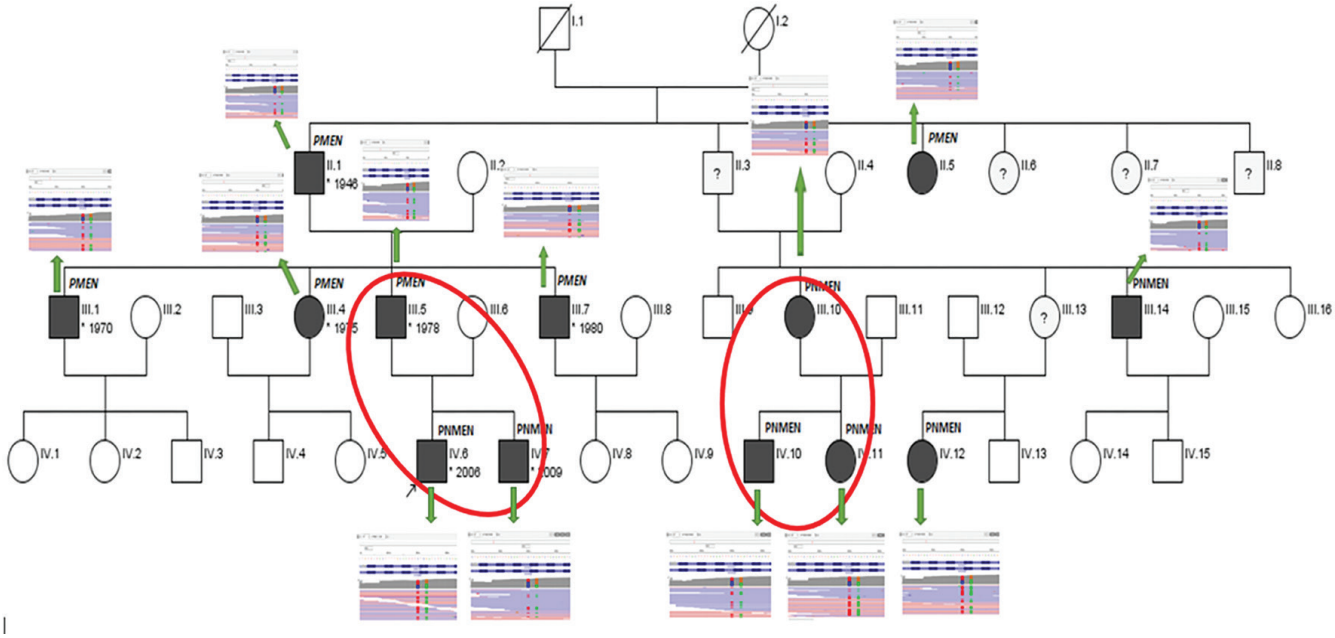

Figure 1. Representation of family aireys with PMEN and PNMEN on pedigree. II-5, IV-6, IV-7 and II-10, IV-10, IV-11 individuals were classified as Group 1 (red circled). The IGV image of the *NCOR1* c.568_571delinsTGAA variant detected in each individual is indicated by a green arrow on the pedigre

PMEN: Primary monosymptomatic enuresis nocturna, PNMEN: Primary non-monosymptomatic enuresis nocturna, IGV: Integrative Genomics Viewer

variants were detected. As shown in Table 3, the exons of *SPIB* and *SIK1* variants were not expressed in brain, pituitary, kidney and bladder tissues in the pathogenesis axis of enuresis nocturna.

In the examination of the 8q, 12q and 13q chromosomal regions, which Eiberg et al.,[6] Arnell et al.,[13] Eiberg,[17] von Gontard et al.[18] and Loeys et al.[22] pointed out for enuresis nocturna in their studies, no variants that could pass the filters were found in these regions. 22q chromosomal region indicated by Eiberg[19] and von Gontard et al.[20] and Loeys et al.[22] *GNAZ* gene in the 22q11 region, pointed by Eiberg[19] were analyzed; all family members were homozygous for the *SCARF2* c.2232delinsGG frameshift variant (22q11.21), whose allele frequency was not found in any pupulation, not included in Clinvar, Likely Patogenic (PM2, PVS1) according to ACMG evaluation, but reputable source recently reports it as benign (BP6). In the examination of 4p chromosome region and *DRD5*, *D1B* genes pointed out by Eiberg et al.,[21] no common rare variant found. No genetic change found in the *DRD4* gene, chr11:636689 locus which Dai et al.[24] emphasized but chr11:637578 G>C benign change found to be heterozygous in three family members (III-10, IV-10, IV-11). Among the risk genes *PRDM13, SIM1* and *EDNRB* that Jørgensen et al.[26] pointed out in their genome-wide association study on enuresis, no variant that could pass the filters was detected. Neither of the two variants of rs9376454, rs60721117 (on chromosome 6q16.2, chromosome 13q22.3) was found none of the individuals. All family members were heterozygous for an intronic variant (c.3600+62del-rs200671404), in the epithelial sodium channel-associated circadian rhythm gene *PER1* that is not located in an intronic non-coding splice site and is not predicted to be the result of a splice modifier (BP7). The *AQP2* c.295 G>A variant of uncertain significance variant, which was detected in one individual (IV-7), was not found in the family in this study and six benign variants of the *AQP2* were homozygous in some individuals and heterozygous in some individuals and the population frequencies of these variants were very high (48-68%).

In the overall analysis, three variants with high pathogenicity common to all family members were remarkable (Table 4). It was observed that these three variants in *NCOR1, MROH2A* and

Table 2. Tissue expression levels of exons of variants associated with overactive bladder and decreased bladder capacity in the Gtex portal

Variant name	Min-max fraction in family	Function	Allele frequency (gnomAD v.4.1.0)	ACMG value	Tissue expression
GALC c.1834+5_1834+9delinsGTGACT (ENST00000261304.7) (Exon17)	0.46-0.73	Splice region	Not found in any population	PM2	No expression*
***PIGQ* c.2002_2003inv (p.Cys668His) (ENST00000026218.5) (Exon 10)**	0.46-1.00	Missense	Not found in any population	PM2	Kidney medulla (MRCPB 2.97)
***CLCNKB* c.641_642delinsGC (p.Ala214Gly) (ENST00000375679.4) (Exon 17)**	1.00-1.00	Missense	Not found in any population	PM2	Kidney medulla, (MRCPB 6.26) Kidney cortex (MRCPB 5.66)

*Exon 17 is not expressed in any tissue, MRCPB: Median read count per base, PM2: Pathogenic moderate-2, ACMG: American Collage of Medical Genetics

Table 3. Tissue expression of exons of variants associated with sleep disorders in Gtex portal

Variant name	Min-max fraction in family	Function	Allele frequency (gnomAD v.4.1.0)	ACMG value	Tissue expression
***PIGQ* c.2002_2003inv (p.Cys668His) (ENST00000026218.5) (Exon 10)**	**0.46-1.00**	**Missense**	**Not found in any population**	**PM2**	**Kidney medulla (MRCPB 2.97)**
SPIB c.309_310delinsCC (p.Ala104Pro) (ENST00000595883.1) (Exon 4)	0.39-1.00	Missense	Not found in any population	PM2	No expression**
***CLCNKB* c.641_642delinsGC (p.Ala214Gly) (ENST00000375679.4) (Exon 7)**	**1.00-1.00**	**Missense**	**Not found in any population**	**PM2**	**Kidney medulla, (MRCPB 6.26) Kidney cortex (MRCPB 5.66)**
SIK1 c.1844_1848delinsTCCCT (p.Ala615Val) (ENST00000270162.6) (Exon 13)	1.00-1.00	Missense	Not found in any population	PM2	No expression***

Only-EBV-transformed lymphocytes, spleen, terminal ileum and transverse colon expression,*There is no expression of exons other than exon 15, MRCPB: Median read count per base, PM2: Pathogenic moderate-2, ACMG: American Collage of Medical Genetics

CCDC140 genes had not been detected previously in population frequency studies. Due to the high variant pathogenicity scores according to ACMG, these variants were included in the next Group 2 study step (Table 4).

Variants in *GALC, SPIB* and *SIK1* genes (exon 17, exon 4 and exon 13), which were found to be mechanism-related in Group 1 analyses, were not included in the Group 2 study because they were not expressed in any tissue according to the Gtex portal. Variants detected in *PIGQ, CLCNKB, NCOR1, MROH2A, CCDC140* genes were analysed in seven individuals in Group 2. Among the variants screened, only the *NCOR1* c.568_571delinsTGAA variant was found to be heterozygous in all family members (Table 5). The variant was read both forward and reverse in the next generation sequencing analysis of all family members as shown in Figures 1 and 2 and its allelic fraction was determined to be 45-53% in all family members, indicating that the variant is inherited heterozygously (Table 5).

Discussion

The most important factor suggesting that enuresis is genetic is the prevalence of family history. Many studies report that approximately half of enuretic children have parents who also experienced this condition. Specific data show that 57% of children with enuresis have parents with the condition, with this rate distributed as 58% in fathers, 36% in mothers, and 6% in both; the presence of this condition in the father is also associated with a high probability ratio of ~5.7.[28] In this study, which aims to investigate genetic factors in the etiology of enuresis, a large family of thirteen cases of PEN from three generations was analysed sociodemographically and genetically. The fact that enuresis does not skip generations in this family in which there is no consanguineous marriage and is transmitted from both mother and father to both girls and boys regardless of gender shows that it is inherited by autosomal dominant inheritance.[12,29] In the first stage of the study, genetic changes in the chromosomal regions 8q,[17] 6q16,[26] 12q,[13] 13q,[6] 4p,[21] and 22q,[19] which were previously predicted to be associated

Table 4. Allele frequency and functions of the three variants with the highest pathogenicity according to ACMG criteria

Variant name	Min-max fraction in family	Function	Allele frequency (gnomAD v.4.1.0)	ACMG value	Tissue expression
NCOR1 c.568_571delinsTGAA (p.Arg190_Glu191delinsTer) (ENST00000268712.3) (Exon 5)	0.26-0.48	Nonsense	Not found in any population	Likely pathogenic (PVS1, PM2)	Brain, hypothalamus (MRCP 0.138) Kidney medulla, (MRCPB 0.261) Bladder (MRCPB 0.233)
MROH2A c.2336T>C (p. Leu779Pro) (NM_001367507.1) (Exon22)	0.47-0.60	Missense	Not found in any population	VUS (PM2)	**Kidney cortex (MRCPB 0.006)**
CCDC140 c.250G>T (p.Gly84Ter) (ENST00000295226.1) (Exon 2)	0.39-0.58	Stop gained	Not found in any population	VUS (PM2)	No expression****

****There is no expression of exons other than exon 3, VUS: Variant of uncertain significance, PM2: Pathogenic moderate-2 (extremely low frequency in gnomAD population databases), PVS1: Patogenic very strong-1 (null variant in a gene where loss of function is a known mechanism of disease), ACMG: American Collage of Medical Genetics

Table 5. Zygosity status of five variants obtained from whole exome sequencing analysis of Group 1 individuals in Group 2 individuals

Variation	Indivisual						
	II-1	**II-5**	**III-1**	**III-4**	**III-7**	**III-14**	**IV-12**
PIGQ c.2002_2003inv (p.Cys668His) (ENST00000026218.5) (Exon 10)	Het	-	Het	-	Hom	-	Het
CLCNKB c.641_642delinsGC (p.Ala214Gly) (ENST00000375679.4) (Exon 7)	-	Het	Hom	Hom	-	Hom	Het
NCOR1 c.568_571delinsTGAA (p.Arg190_Glu191delinsTer) (NM_006311.4) (Exon 5)	**Het**	**Het**	**Het**	**Het**	**Het**	**Het**	**Het**
MROH2A c.2336T>C (p. Leu779Pro) (NM_001367507.1) (Exon22)	Het	Het	-	-	-	-	-
CCDC140 c.250G>T (p.Gly84Ter) (ENST00000295226.1) (Exon 2)	Het	Het	-	-	-	Het	-

Het: Heterozygous, Hom: Homozygous

with enuresis, were filtered for common variants among all individuals, and no common, rare, and disease-related variant was found. Although the coverage of the *PRDM13, SIM1, EDNRB, PER1*, and *AQP2* risk genes was complete, no candidate variants were found in any of them.

Many theories have been put forward since the 1960s that children with enuresis have small bladder volumes. So far, the general opinion on this subject is that nocturnal detrusor overactivity may be effective in enuretic children.[30,31] Bladder dysfunction was detected in three members of the family (IV-7,IV-12,IV-6) and this finding guided the clinical filtering of WES variants. All individuals stated that they had difficulty waking-up from sleep and they were awakened by loud noises or physical stimuli. Some individuals reported that they had fearful dreams and woke up with a distinct scream, and some individuals reported snoring during sleep.

This family situation supports reports in the literature showing that children with enuresis nocturna suffer from uncomfortable sleep.[32,33] In a recent study analysing the global prevalence of enuresis nocturna, it was reported that it was more frequent in patients with low socioeconomic status and positive family history.[34] The three generations of vertical transmission and the middle-low income level in this family we analysed support this information. In this context, it was aimed to analyse the common genetic changes in the largest family that could be found by WES method. All exon sequences and intronic regions were analysed and candidate variants of the family with were considered in the first stage. Three common variants in the *GALC, PIGQ* and *CLCNKB* genes were identified through filtering of genes associated with urinary retention, bladder dysfunction, urinary bladder sphincter dysfunction, autonomic bladder dysfunction, spastic/overactive bladder, and urinary incontinence in HPO. Based on the finding that deep sleep and sleep terror symptoms in family members suggest a connection between enuresis and deep sleep, sleep disorders in HPO include sleep-wake cycle disorder, impaired transitions between sleep and wakefulness states, abnormal sleep architecture, sleep-wake reversal, nighttime seizures, parasomnia, hypersomnia, sleep-wake cycle disorder, sleep terror, and somnambulism. Four missense variants were detected in the *SPIB, SIK1, PIGQ* and *CLCNKB* genes. But three of variants (in the *GALC, SPIB* and *SIK1* genes) were found not to show appropriate tissue expression. The presence of two variants in the two genes *PIGQ* and *CLCNKB*, which are associated with the responsible mechanism, was promising. Group 2 included variants in the *NCOR1, MROH2A,* and *CCDC140* genes, as well as variants in the *PIGQ* and *CLCNKB* genes identified through mechanism filtering. Only the variant in the *NCOR1* gene was found to be heterozygous (allele frequency: 45-53%) in Group 2 individuals. This loss-of-function variant was not found in the gnomAD v.4.1.0 population screen. It was evaluated as PVS1 and PM2 according to in silico prediction tools. Brain and bladder expression of the 5th exon in which the variant is located was found to be expressed in the bladder, brain and hypothalamus. The probability to autosomal dominant score of the gene was 0.9992, indicating a very highly dominant effect. *NCOR1* gene, encodes a transcriptional choregulatory protein involved in the balance between histone acetyltransferases and histone deacetyltransferases. *NCOR1* loss-of-function intolerant (pLI) score of 1.00 indicates that it is a dosage-sensitive gene and the role of truncating mutations in autism spectrum disorder and intellectual disability has been shown.[35,36] The fact that enuresis nocturne is observed more frequently in children with autism spectrum disorder is frequently included in current studies.[37,38]

NCOR1 protein is 2440 amino acids long and has G-protein pathway suppressor 2-interacting and Myb-like DNA-binding functional domains between amino acids 150-238 and 627-670, respectively.[39] *NCOR1* c.568_571delinsTGAA p.(Arg190_Glu191delinsTer) mutation results in a prematurely terminated stubby protein and causes loss of functional domains. As seen in Figure 3, while the wild type (Red) protein has 1 alpha helix structure in the first 190 amino acids, the mutant type (Blue)

Figure 2. IGV image of the NCOR1 c.568_571delinsTGAA variant
IGV: Integrative Genomics Viewer

stubby protein formed as a result of the mutation is predicted to have more alpha helix structures using protein folding models. As a result of the loss of functional regions of the protein and changes in the folding model, it is predicted that this mutation will cause the protein to lose its function. Exon 5 in which the variant is found is expressed in tissues in the pathogenesis pathway of enuresis nocturna,[40] albeit at a low level (Table 4).

The variant screening phase in Group 2 individuals was also performed using the new generation sequencing (Mi-Seq Illumina) method. Since it was not possible to reach the families for new sample collection, confirmation with Sanger could not be performed. The IGV readings of the c.568_571delinsTGAA (p.Arg190_Glu191delinsTer) variant in *NCOR1* gene detected in the family were shown on the pedigree (Figure 1). In the functional analysis of the variant, it was concluded that it changes the protein structure and the exon in which it is located is expressed in the bladder, brain, hypothalamus which have main roles of sleep pathways and enuresis. *NCOR1* forms complexes with many other proteins responsible for neural development. This indirectly suggests that this protein plays an important role in neural development. Heterozygous mutations in the *NCOR1* gene are predicted to be a cause of syndromic intellectual disability/autism spectrum disorder together with neural development proteins.[40]

The family we studied with nocturnal enuresis confirms the mechanisms of nocturnal enuresis with its sociodemographic and genetic characteristics. In short, the fact that nocturnal enuresis does not skip generations and is passed on to both daughters and sons from both the mother and father strongly suggests that the condition is transmitted through autosomal dominant inheritance. The presence of both bladder symptoms and difficulty waking up from sleep in the family history reflects the general history of individuals with nocturnal enuresis in our society and reiterates the need to focus more on these mechanisms.

When considering the etiology of nocturnal enuresis from a broad perspective, the most recent review concluded that familial background is a factor, but a single Mendelian inheritance pattern has not yet been identified, and the matter remains open-ended.[41] The research clearly shows that nocturnal enuresis is caused by genetic factors, but we have found that WES alone may be insufficient in this regard, and that studies need to be conducted with additional tests in larger independent groups. The *NCOR1* gene has opened the door to the possibility that enuresis may result from the immaturation of neurodevelopmental processes, and meaningful changes in this gene could be included in functional studies in future research on this topic.

Study Limitations

The *NCOR1* c.568_571delinsTGAA p.(Arg190_Glu191delinsTer) variant has not been demonstrated in any healthy population in the gnomAD v.4.1.0 (Fraction of individuals with coverage over 30 is 0.7) and the possibility of missing coverage in this range is a disadvantage. Even with good whole exome coverage, the possibility of missing a variant that may be very rare in family members should also be considered. All genetic studies conducted on the family we worked with were performed using next-generation sequencing. One limitation of the study is that confirmation could not be obtained using Sanger sequencing, as it was not possible to contact family members to obtain new samples for confirmation.

A limitation of the study is that whole exome/whole genome sequencing could not be performed on all family members, including individuals without symptoms, and the variant found could not be shown to be absent in healthy individuals. Since enuresis nocturna is a questioning based on the past, there may be error rates due to failure to recall in such voluntary studies. Polymorphic variants predisposing to multifactorial diseases such as enuresis nocturna are known to cause disease together with facilitating factors. In this context, it is more likely to be a polymorphic change that produces a founder effect rather than a rare pathogenic/likely pathogenic change of a single gene.

Bladder symptoms in the family have been recorded in some individuals using voiding cystourethrography, but sleep

Figure 3. Protein modelling of the *NCOR1* c.568_571delinsTGAA variant was performed in I-TASSER v.5.1 (a) and PyMol V.2.5.5 analysis programs (b). The wild-type (Red) protein has one alpha-helical structure, while the mutant type (Blue) protein, which is formed as a result of mutation, exhibits more alpha-helical structures

symptoms are based solely on findings from the medical history and observations and have not been confirmed by a sleep laboratory or sleep electroencephalography. Although most studies conducted to date have strongly emphasized the connection between enuresis and sleep depth, the observations of the parents of the subjects in these studies have been considered a strong finding.[42-45]

Conclusion

Genetic studies in our country are still lacking, both due to the inadequacy of our healthy population studies and for cost reasons. One reason why the underlying causes of conditions such as enuresis, which negatively affect the mental health of children and adolescents, cannot be clarified is the difficulty of conducting high-cost studies such as genetic studies in our society. This study is the first genetic study in the world conducted on a family with three generations of nocturnal enuresis and is unique in the literature.

Ethics

Ethic Committee Approval: Approval certificate dated 30.01.2019 and numbered 20.478.486 was obtained from Manisa Celal Bayar University Faculty of Medicine Health Board ethics committee for this study.

Informed Consent: Written informed consent was obtained from all parents.

Footnotes

Authorship Contributions

Surgical and Medical Practices: F.S.Ç., Concept: A.A.G., F.S.Ç., Design: A.A.G., F.S.Ç., Data Collection or Processing: A.A.G., Analysis or Interpretation: A.A.G., Literature Search: A.A.G., F.S.Ç., Writing: A.A.G., F.S.Ç.

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Bir Üniversite Hastanesi Çocuk ve Ergen Ruh Sağlığı ve Hastalıkları Kliniğinde Sağlık Tedbiri Kararı Kapsamında Takip Edilen Çocuk ve Ergenlerin Sosyodemografik ve Klinik Özellikleri

Sociodemographic and Clinical Characteristics of Children and Adolescents Monitored Under Health Precaution Decisions in A University Child and Adolescent Psychiatry Clinic

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ÖZ

Amaç: Bu çalışma, bir üniversite hastanesi çocuk ve ergen ruh sağlığı polikliniğinde sağlık tedbiri kararı kapsamında takip edilen olguların sosyodemografik ve klinik özelliklerini geriye dönük olarak değerlendirmeyi amaçlamıştır.

Gereç ve Yöntem: Haziran 2020-Haziran 2025 tarihleri arasında Bolu Abant İzzet Baysal Eğitim ve Araştırma Hastanesi, Çocuk ve Ergen Ruh Sağlığı ve Hastalıkları Anabilim Dalı'nda sağlık tedbiri kararı ile takip edilen 48 olgunun dosyaları taranmıştır. Çalışma, Bolu Abant İzzet Baysal Üniversitesi Girişimsel Olmayan Klinik Araştırmalar Etik Kurulu tarafından onaylanmıştır (karar no: 2025/329, tarih: 12.08.2025). Veriler anonimleştirilerek işlenmiş olup istatistiksel analizler SPSS 25.0 programı ile yapılmıştır.

Bulgular: Olguların yaş ortalaması 158,3±41,0 ay (yaklaşık 13,2 yıl) olup %62,5'i ergen, %58,3'ü erkekti. Olguların %56,3'ü parçalanmış ailelerde yaşamakta, %33,3'ünde özel eğitim desteği bulunmaktaydı. Sağlık tedbiri kararlarının en sık gerekçesi bakım veren yetersizliği (%54,3) idi. Psikiyatrik tanı oranı %77,1 olup en sık travma sonrası stres bozukluğu ve dikkat eksikliği hiperaktivite bozukluğu tanılarının alındığı görülmüştür. Ergenlerde psikiyatrik tanı oranı çocuklara göre anlamlı derecede yüksekti (p=0,011).

Sonuç: Bulgular, sağlık tedbiri kapsamındaki olgularda düşük sosyoekonomik düzey, aile yapısındaki bozulma ve yüksek psikiyatrik komorbiditeyi vurgulamaktadır. Erken müdahale, aile destek programları ve çok disiplinli yaklaşım bu olgularda önem taşıyabilir. Çalışma, Türkiye'de bu alandaki literatüre katkı sağlamakta olup çok merkezli ileriye dönük araştırmalar önerilmektedir.

Anahtar Kelimeler: Sağlık tedbiri, çocuk istismarı, ihmal, sosyodemografik özellikler, psikiyatrik tanı, retrospektif çalışma

ABSTRACT

Objectives: This study aimed to retrospectively evaluate the sociodemographic and clinical characteristics of cases followed under health precaution decisions in a university hospital child and adolescent mental health clinic.

Materials and Methods: Files of 48 cases followed under health precaution decisions at Bolu Abant İzzet Baysal Training and Research Hospital Child and Adolescent Mental Health Department between June 2020 and June 2025 were reviewed. The study was approved by the Non-Interventional Clinical Research Ethics Committee of Bolu Abant İzzet Baysal University (decision no: 2025/329, date: 12.08.2025). Data were processed anonymously, and statistical analyses were performed using SPSS 25.0.

Results: The mean age of the cases was 158.3±41.0 months (approximately 13.2 years), with 62.5% adolescents and 58.3% males. 56.3% of the sample lived in broken families, and 33.3% required special education support. The most common reason for health precaution decisions was caregiver inadequacy (54.3%). Psychiatric diagnosis rate was 77.1%, with post-traumatic stress disorder and attention deficit hyperactivity disorder being the most frequent diagnoses. Psychiatric diagnosis rate was significantly higher in adolescents compared to children (p=0.011).

Conclusion: The findings highlight low socioeconomic status, disrupted family structure, and high psychiatric comorbidity in cases under health precaution. Early intervention, family support programs, and multidisciplinary approaches may be important in these cases. The study contributes to the literature in Türkiye and multicenter prospective studies are recommended.

Keywords: Health precaution, child abuse, neglect, sociodemographic characteristics, psychiatric diagnosis, retrospective study

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Giriş

Çocuk istismarı ve ihmali, dünya genelinde önemli bir halk sağlığı sorunu olarak kabul edilir. İstismar ve ihmal çocukların fiziksel, duygusal ve bilişsel gelişimini çocukluk döneminin de ilerisine dek olumsuz yönde etkileyebilmektedir.[1-4] Dünya Sağlık Örgütü'ne göre, 18 yaş altındaki çocukların maruz kaldığı fiziksel ve/veya duygusal kötü muamele, cinsel istismar, ihmal veya sömürü gibi durumlar, genel olarak "*maltreatment*" (istismar/ihmal) olarak tanımlanmaktadır.[4] İhmal, çocukların temel ihtiyaçlarının karşılanmaması anlamına gelirken, istismar kasıtlı zarar verme eylemlerini içermektedir ve çocukların çoğu birden fazla istismar veya ihmal türüne aynı anda maruz kalmaktadır.[3] İhmal/istismarın kısa ve uzun vadeli sonuçları arasında psikopatoloji, gelişimsel gecikmeler, sosyal ve ekonomik dezavantajlar, akademik başarısızlık ile yetişkinlik dönemine uzanan sağlık sorunları sayılabilir.[1,4] Özellikle küçük çocuklarda tanı koyma süreci daha zorlu olup, değerlendirme için daha fazla zaman ve dikkat gerektirmekte; tedavi ise genellikle çok yönlü bir yaklaşımla çocuğun çevresel faktörlerini de kapsamaktadır.[2] Türkiye'de çocukların fiziksel ve ruhsal sağlığını korumaya yönelik yasal düzenlemeler, 5395 sayılı Çocuk Koruma Kanunu ile gerçekleştirilmiştir.[5,6] Bu kanun kapsamında sağlık, danışmanlık, eğitim, bakım ve barınma tedbirleri tanımlanmış olup, sağlık tedbiri 5/1-d bendinde "çocuğun fiziksel ve ruhsal sağlığının korunması ve tedavisi için gerekli geçici veya sürekli tıbbi bakım ve rehabilitasyonuna, bağımlılık yapan maddeleri kullananların tedavilerinin yapılmasına yönelik tedbir" olarak belirtilmiştir.[5] Sağlık tedbiri kararı, çocuğun ebeveynleri veya vasi gibi yasal temsilcileri, Sosyal Hizmetler ve Çocuk Esirgeme Kurumu veya cumhuriyet savcısı talebi üzerine ya da çocuk hakimi tarafından re'sen verilebilmekte; kararın uygulanması il sağlık müdürlükleri tarafından yürütülmekte ve tedbire konu koşullar ortadan kalktığında veya çocuk gelişimini tamamladığında hakim tarafından kaldırılabilmektedir.[7] Sağlık tedbiri kapsamında takip edilen çocukların önemli bir kısmını suça sürüklenen çocuklar (SSÇ) oluşturmakta olup, 5395 sayılı kanuna göre "suç" olarak tanımlanan bir fiili işlediği iddiasıyla hakkında soruşturma veya kovuşturma yapılan ya da işlediği fiilden dolayı güvenlik tedbirine karar verilen çocuklar SSÇ olarak tanımlanmaktadır.[6] Türkiye İstatistik Kurumu verilerine göre, 2023 yılında ülkemizde SSÇ sayısı 178.800 olarak bildirilmiş olup, bu çocuklara en sık "yaralama" (%39,8) ve "hırsızlık" (%20,8) suçları isnat edildiği bildirilmiştir.[8] Yazında, sağlık tedbiri kapsamında takip edilen çocukların sosyodemografik ve klinik özelliklerini inceleyen çalışmalar, bu olguların genellikle düşük sosyoekonomik düzey, aile içi çatışmalar, ebeveyn psikopatolojisi ve madde kullanımı öyküsü gibi risk faktörleriyle ilişkili olduğunu ortaya koymaktadır.[9-14] Örneğin, SSÇ'lerin adli psikiyatrik değerlendirmelerinde dikkat eksikliği hiperaktivite bozukluğu (DEHB), davranım bozukluğu (DB), zeka geriliği ve depresif bozukluk gibi tanılar sıklıkla görülmekte; ebeveyn boşanması veya hapishane öyküsü gibi aile yapısındaki bozulmalar bu bozuklukların şiddetini artırmaktadır.[10,11,14] Benzer şekilde, sağlık tedbiri veya kurum bakımındaki çocuklarda düşük aile eğitim düzeyi, düzenli istihdam eksikliği ve psikiyatrik komorbiditeler ön planda olup, pandemi dönemlerinde artan istismar olguları tedbir kararlarının önemini vurgulamaktadır.[11,12,15,16] Bu olgularda DEHB, DB, madde kullanım bozukluğu, depresif bozukluk, anksiyete bozukluğu, akut stres tepkisi, travma sonrası stres bozukluğu (TSSB), uyum bozukluğu, gelişimsel dil ve konuşma bozukluğu, bilişsel gerilik, psikotik bozukluk, obsesif kompulsif bozukluk gibi psikiyatrik tanıların varlığı ve madde öyküsü sıklıkla vurgulanmakta; düzenli takip ve psikiyatrik tedavinin faydası belirtilmektedir.[11,13,15,17,18] Yazında sağlık tedbiri kapsamında takip edilen çocukların sosyodemografik ve klinik özelliklerini inceleyen çeşitli çalışmalar mevcut olsa da, bu çalışmaların bir kısmı belirli bölgelerle sınırlı kalmakta veya kısıtlı veri setlerine dayanmakta olup, üniversite hastanesi bağlamında kapsamlı bir retrospektif dosya taraması içeren bütüncül yaklaşımlar literatüre daha fazla çeşitlilik katabilecek niteliktedir.[9,11,15,16] Bu bağlamda mevcut çalışma, bir üniversite hastanesinde sağlık tedbiri kararı kapsamında takip edilen olguların dosyalarını geriye dönük olarak tarayarak sosyodemografik ve klinik özelliklerini değerlendirmeyi amaçlamaktadır. Araştırmanın bulguları, çocuk psikiyatri pratiğinde sağlık tedbirlerinin etkinliğini artırmaya, koruyucu bakım modellerinin iyileştirilmesine ve tedavi protokollerinin optimize edilmesine katkı sağlayacaktır.

Gereç ve Yöntem

Bu çalışma, geriye dönük dosya taraması yöntemiyle gerçekleştirilmiş kesitsel bir araştırmadır. Araştırma, Bolu Abant İzzet Baysal Eğitim ve Araştırma Hastanesi Çocuk ve Ergen Ruh Sağlığı ve Hastalıkları Anabilim Dalı'nda Haziran 2020-Haziran 2025 tarihleri arasında 5395 sayılı Çocuk Koruma Kanunu kapsamında sağlık tedbiri kararı ile takip edilen olguların dosyaları üzerinden yürütülmüştür. Çalışma için Bolu Abant İzzet Baysal Üniversitesi Girişimsel Olmayan Klinik Araştırmalar Etik Kurulu tarafından 12.08.2025 tarih ve 2025/329 karar numaralı onay alınmıştır. Retrospektif tasarım nedeniyle olgulardan veya yasal temsilcilerinden ayrıca bilgilendirilmiş onam alınmamıştır; tüm veriler anonimleştirilerek ve gizlilik ilkelerine uygun şekilde işlenmiştir.

Çalışmanın evrenini belirtilen dönemde sağlık tedbiri kararı ile polikliniğe yönlendirilen çocuk ve ergen olguları oluşturmuştur. Dahil etme kriterleri sağlık tedbiri kararı bulunması ve dosyalarda sosyodemografik ile klinik verilerin yeterli düzeyde kayıtlı olması olarak belirlenmiştir. Dosya bilgileri eksik olan veya takip süresi yetersiz olan olgular çalışma dışı bırakılmıştır. Sonuçta toplam 48 olgu çalışmaya dahil edilmiştir.

Veri toplama sürecinde hastane bilgi yönetim sistemi ve fiziksel dosyalar taranarak olguların yaşı, cinsiyeti, eğitim durumu, özel eğitim desteği varlığı ve süresi, sağlık kurulu raporu varlığı ile tanısı, birlikte ikamet ettiği kişiler, ikamet adresinin yerleşim tipi, ebeveynlerin eğitim ve meslek durumu, kardeş sayısı ve kardeşlerde tedbir/psikiyatrik hastalık varlığı, ailede psikiyatrik hastalık, madde kullanımı ve suç öyküsü, aile gelir düzeyi, sağlık tedbiri kararını talep eden kişi, tedbir gerekçesi ve türü, psikiyatrik tanılar (DSM-5 kriterlerine göre), komorbid

durumlar, takip sıklığı, psikotrop ilaç kullanımı ve tedavi uyumu gibi sosyodemografik ve klinik değişkenler kaydedilmiştir. Veri girişi çift kontrol yöntemiyle gerçekleştirilmiş ve olası tutarsızlıklar giderilmiştir.

İstatistiksel Analiz

İstatistiksel analizler SPSS 25.0 (IBM Corp., Armonk, NY, USA) paket programı kullanılarak yapılmıştır. Sürekli değişkenler ortalama ± standart sapma veya medyan (minimum-maksimum) şeklinde, kategorik değişkenler ise sayı ve yüzde olarak ifade edilmiştir. Sürekli değişkenlerin normal dağılıma uygunluğu Kolmogorov-Smirnov testi ile değerlendirilmiş; normal dağılım gösteren değişkenler için Student t-testi, normal dağılım göstermeyenler için Mann-Whitney U testi kullanılmıştır. Kategorik değişkenler arasındaki ilişkiler ki-kare testi veya gerekli durumlarda Fisher'ın kesin testi ile incelenmiştir. Çocuk ve ergen yaş grupları arasındaki karşılaştırmalarda istatistiksel anlamlılık ve etki boyutu hesaplanmıştır. İstatistiksel anlamlılık $p<0,05$ düzeyinde kabul edilmiştir.

Bulgular

Çalışma kapsamında Haziran 2020-Haziran 2025 tarihleri arasında sağlık tedbiri kararı ile takip edilen toplam 48 olgu değerlendirilmiştir. Olguların yaş ortalaması 158,3±41,0 ay (yaklaşık 13,2 yıl) olup %37,5'i (n=18) çocuk (0-12 yaş), %62,5'i (n=30) ergen (13-18 yaş) yaş grubundadır. Cinsiyet dağılımı %58,3 erkek (n=28) ve %41,7 kız (n=20) şeklindedir.

Olguların eğitim durumları incelendiğinde %58,3'ünün (n=28) ilkokul, %31,3'ünün (n=15) lise düzeyinde eğitim aldığı saptanmıştır. Olguların üçte biri (n=16, %33,3) özel eğitim desteği almaktadır (Tablo 1). Olguların %33,3'ünde (n=16) sağlık kurulu raporu mevcut olup en sık tanılar zihinsel yetersizlik (%50, n=8), özgül öğrenme bozukluğu (%43,8, n=7) ve otizm spektrum bozukluğu (%6,3, n=1) idi. Sağlık kurulu raporu olan olgularda özel eğitim alma süresi ortalama 4,13±4,06 yıl olarak saptanmıştır.

Olguların aile ve ikamet özellikleri değerlendirildiğinde %29,2'si (n=14) sadece anne, %27,1'i (n=13) sadece baba ile yaşamaktaydı; %14,6'sı (n=7) kurum bakımındaydı. İkamet adreslerinin %83,3'ü (n=40) şehir merkeziydi. Annelerin %62,5'i (n=30) ilkokul, babaların %66,6'sı (n=32) ilkokul mezunuydu; annelerin %68,8'i (n=33) ev hanımı, babaların %68,8'i (n=33) işçiydi (Tablo 2). Ailede anne tarafında psikiyatrik hastalık oranı %14,6 (n=7), baba tarafında %10,4 (n=5) olarak tespit edilmiştir.

Olguların %85,4'ünde (n=41) kardeşi bulunmakta olup kardeş sayısı medyan 3 (2-13) idi. Kardeşlerin %37,5'inde (n=18) tedbir kararı, %33,3'ünde (n=16) psikiyatrik hastalık (en sık zihinsel yetersizlik, n=7) mevcuttu.

Sağlık tedbiri kararını en sık sosyal hizmet uzmanları (%58,3, n=28) talep etmiş; en sık gerekçe bakım veren yetersizliği (%54,3, n=26) olmuştur. Olguların %47,9'unda (n=23) sadece sağlık tedbiri, kalanlarda ek tedbirler (danışmanlık, eğitim, bakım) eşlik etmiştir (Tablo 3). Tedbir kararının çıkarıldığı yaş ortalaması 10,7± 3,6 yıldır.

Olguların %77,1'ine (n=37) psikiyatrik tanı konulmuştur. En sık tanılar post-travmatik stres bozukluğu ve DEHB (%16,2'şer, n=6) olarak saptanmış ve olguların yaklaşık üçte birine birden fazla psikiyatrik bozukluk tanısı (%27, n=10) konulduğu görülmüştür (Tablo 4). Olguların %58,3'üne (n=28) psikotrop ilaç önerilmiş olup takip sıklığı çoğunlukla aylık (%54,2, n=26) olarak not edilmiştir.

Tablo 1. Bir üniversite hastanesi çocuk ve ergen ruh sağlığı ve hastalıkları kliniğinde sağlık tedbiri kararı kapsamında beş yıllık süre içinde takip edilen olguların eğitim durumları

		n	%
Eğitim durumu	Okul öncesi	1	2,1
	İlkokul	28	58,3
	Lise	15	31,3
	İlkokul terk	3	6,3
	Lise terk	1	2,1
Özel eğitim desteği	Var	16	33,3
	Yok	32	66,7

Tablo 2. Bir üniversite hastanesi çocuk ve ergen ruh sağlığı ve hastalıkları kliniğinde sağlık tedbiri kararı kapsamında beş yıllık süre içinde takip edilen olguların aile durumları, ikamet ettikleri yer, anne-babalarının eğitim ve meslekleri

		n	%
Kimle yaşadıkları	Sadece anne	14	29,2
	Sadece baba	13	27,1
	Anne-baba	11	22,9
	Diğer akraba	3	6,3
	Kurum bakımı	7	14,6
İkamet ettikleri yer	Köy	4	8,3
	İlçe	4	8,3
	Şehir merkezi	40	83,3
Annede psikiyatrik hastalık		7	14,6
Babada psikiyatrik hastalık		5	10,4
Annenin eğitim durumu	Okur yazar değil	6	12,6
	İlkokul	30	62,5
	Lise	10	20,8
	Üniversite	1	2,1
Babanın eğitim durumu	Okur yazar değil	2	4,2
	İlkokul	32	66,6
	Lise	13	27,1
	Üniversite	1	2,1
Anne mesleği	Ev hanımı	33	68,8
	Memur	2	4,2
	İşçi	13	22,9
Baba mesleği	İşçi	33	68,8
	Memur	4	8,3
	Emekli	3	6,3
	Çalışmıyor	8	16,7

Çocuk ve ergen yaş grupları karşılaştırıldığında ergenlerde psikiyatrik tanı oranı anlamlı olarak daha yüksek bulunmuştur (çocuk %55,6, ergen %90,0; p=0,011, etki boyutu 0,397). Psikotrop ilaç kullanımı açısından gruplar arasında anlamlı fark saptanmamıştır (p=0,545).

Tablo 3. Bir üniversite hastanesi çocuk ve ergen ruh sağlığı ve hastalıkları kliniğinde sağlık tedbiri kararı kapsamında beş yıllık süre içinde takip edilen olguların sağlık tedbir kararlarını talep eden kişiler, kararların çıkarılma sebepleri ve tedbir kararı türü

		n	%
Tedbir kararını talep eden	Sosyal hizmet uzmanı	28	58,3
	Hekim/sağlık çalışanı	18	37,5
	Aile	1	2,1
	Sosyal çevre/komşu	1	2,1
Tedbir kararının türü	Sadece sağlık	23	47,9
	Sağlık ve danışmanlık	13	27,1
	Sağlık ve eğitim	2	4,2
	Sağlık ve bakım	1	2,1
	Sağlık, danışmanlık ve eğitim	6	12,5
	Sağlık, bakım ve eğitim	3	6,3
Tedbir gerekçesi	Bakım veren yetersizliği	26	54,3
	Cinsel istismar mağduru	7	14,6
	Fiziksel istismar mağduru	5	10,4
	Tedavi uyumsuzluğu	2	4,2
	Suça sürüklenme	1	2,1
	Madde kullanım bozukluğu	1	2,1
	Kendine zarar verme	1	2,1
	Cinsel ve fiziksel istismar mağduru	2	4,2

Tablo 4. Bir üniversite hastanesi çocuk ve ergen ruh sağlığı ve hastalıkları kliniğinde sağlık tedbiri kararı kapsamında beş yıllık süre içinde takip edilen olgulara konulan psikiyatrik tanılar

	n	%
DEHB	6	16,2
Davranım bozukluğu	3	8,1
Madde kullanım bozukluğu	3	8,1
Akut stres bozukluğu	1	2,7
Travma sonrası stres bozukluğu	6	16,2
Obsesif kompulsif bozukluk	2	5,4
Uyum bozukluğu	1	2,7
Majör depresif bozukluk	3	8,1
Özgül öğrenme bozukluğu	2	5,4
Birden fazla psikiyatrik bozukluk	10	27,0
Toplam	37	100

DEHB: Dikkat eksikliği ve hiperaktivite bozukluğu

Tartışma

Bu çalışmada, bir üniversite hastanesi çocuk ve ergen psikiyatri polikliniğinde sağlık tedbiri kararı kapsamında takip edilen 48 olgunun sosyodemografik ve klinik özellikleri retrospektif olarak değerlendirilmiştir. Olguların yaş ortalaması yaklaşık 13 yıl olup, çoğunluğu ergen yaş grubunda (%62,5) ve erkek cinsiyette (%58,3) bulunmuştur. Bu bulgu, yazındaki benzer çalışmalarla kısmen uyumludur; örneğin Güller ve Yaylacı[11] tarafından sağlık tedbiri kapsamında takip edilen çocuk ve ergenlerin çoğunluğunun ergen yaş grubunda olduğu bildirilmiş olup, ergenlik dönemindeki risk faktörlerinin tedbir kararlarını artırabileceğini desteklemektedir. Benzer şekilde, Akdağ[9] bir ilçe örnekleminde sağlık tedbiri kapsamındaki çocukların yaş dağılımını ele alırken erkek cinsiyetin baskınlığını vurgulamakta olup, çalışmamızdaki %58,3 erkek oranı bu gözlemleri pekiştirmektedir.

Eğitim durumları incelendiğinde olguların %58,3'ü ilkokul, %31,3'ü lise düzeyinde olup %33,3'ünde özel eğitim desteği gerekliliği dikkat çekicidir. Sağlık kurulu raporlarında en sık zihinsel yetersizlik ve özgül öğrenme bozukluğu tanıları yer almaktadır. Bu bulgular, Bozduman Çelebi ve ark.[16] üç yıllık retrospektif incelemesinde belirtilen düşük eğitim seviyesi ve özel eğitim ihtiyacını yansıtmaktadır; onların çalışmasında da sosyodemografik özellikler arasında eğitim dezavantajı ön planda olup, tedbir kapsamındaki çocukların akademik başarısızlık riskini artırmaktadır. Ayrıca, Özkan ve ark.[13] sağlık tedbiri altındaki ergenlerde sosyodemografik özellikler ve psikiyatrik tanıları incelerken öğrenme bozukluklarının komorbiditesini vurgulamakta olup, çalışmamızdaki %43,8 özgül öğrenme bozukluğu oranı bu literatürle paralellik göstermektedir.

Olguların aile yapılarına bakıldığında %56,3'ünün parçalanmış ailelerde (sadece anne veya baba ile) yaşadığı, %14,6'sının kurum bakımında olduğu görülmüştür. Ailede psikiyatrik hastalık öyküsü anne tarafında %14,6, baba tarafında %10,4 oranında olup, kardeşlerde tedbir kararı %37,5, psikiyatrik hastalık %33,3'tür. Bu durum, Er Fazlıoğlu[15] tarafından sosyal hizmet perspektifinden değerlendirilen sağlık tedbiri kapsamındaki çocukların ve ailelerinin psikososyal özelliklerinde belirtilen aile içi çatışmalar ve ebeveyn psikopatolojisiyle uyumludur; onların çalışmasında da aile yapısındaki bozulmalar tedbir kararlarının altında yatan faktörler olarak vurgulanmaktadır. Karagöz[12] çocuk evlerinde kalan çocuk ve ergenlerin klinik özelliklerini incelediğinde kurum bakımının ve aile öyküsündeki psikopatolojinin rolünü belirtmekte olup, çalışmamızdaki %14,6 kurum bakımı oranı bu bulguları desteklemektedir.

Sağlık tedbiri kararlarının en sık bakım veren yetersizliği nedeniyle (%54,3) verilmesi ve sosyal hizmet uzmanları tarafından (%58,3) talep edilmesi, istismar/ihmal olgularının altında yatan aile dinamiklerini yansıtmaktadır. Olguların %47,9'unda sadece sağlık tedbiri verilmiş olup, kalanlarda danışmanlık, eğitim veya bakım tedbirleri eklenmiştir.

Bu bulgular, Yüksel[14] tarafından bir üniversite hastanesi bağlamında SSÇ'lerin değerlendirilmesinde belirtilen tedbir gerekçeleriyle kısmen örtüşmekte; ancak çalışmamızda suça sürüklenme oranı düşük (%2,1) olup, bakım yetersizliğinin baskınlığı dikkat çekicidir. Bilginer ve ark.[10] SSÇ'lerin adli psikiyatrik değerlendirmelerinde aile içi risk faktörlerini vurgulamakta olup, çalışmamızdaki bakım veren yetersizliği bu literatürle ilişkilendirilebilir.

Psikiyatrik tanı oranı %77,1 ile yüksek olup, en sık TSSB (%16,2), DEHB (%16,2) ve birden fazla komorbid bozukluk (%27) görülmüştür. Ergenlerde tanı oranı çocuklara göre anlamlı derecede fazladır (p=0,011, etki boyutu 0,397). Bu bulgular, Karagöz[18] tarafından sağlık tedbiri altında takip edilen çocuk ve ergenlerin klinik özelliklerinin incelenmesinde belirtilen psikiyatrik tanı çeşitliliğiyle uyumludur; onların çalışmasında da DEHB, DB ve TSSB gibi tanılar ön planda olup, ergenlik dönemindeki artış vurgulanmaktadır. Aktay[17] istismar ve ihmalin etkilerini tartışırken TSSB ve depresif bozuklukların uzun vadeli sonuçlarını belirtmekte olup, çalışmamızdaki %16,2 TSSB oranı bu gözlemleri desteklemektedir.

Psikotrop ilaç kullanımı %58,3 olup, takip sıklığı genellikle aylık düzeydedir (%54,2). Bu oranlar, Güller ve Yaylacı[11] çalışmasında belirtilen düzenli takip ve tedavinin faydasıyla paralellik göstermekte olup, tedbir kapsamındaki olgularda psikiyatrik müdahalenin önemini vurgulamaktadır.

Çalışmanın Kısıtlılıkları

Çalışmanın güçlü yönleri arasında üniversite hastanesi bağlamında kapsamlı retrospektif tarama ve etik onaylı tasarım sayılabilir. Sınırlılıkları ise tek merkezli olması, küçük örneklem boyutu (n=48) ve retrospektif tasarım nedeniyle veri eksiklikleridir; bu durum, genellenebilirliği kısıtlayabilir. Gelecek çalışmalar, çok merkezli prospektif tasarımlarla bu bulguları doğrulamalı ve müdahale stratejilerini geliştirmelidir.

Sonuç

Geriye dönük bu çalışma, bir üniversite hastanesi çocuk ve ergen ruh sağlığı polikliniğinde sağlık tedbiri kararı kapsamında takip edilen 48 olgunun sosyodemografik ve klinik özelliklerini ortaya koymuştur. Olguların büyük kısmı ergen yaş grubunda, erkek cinsiyetinde olup parçalanmış aile yapısı, düşük eğitim düzeyi ve bakım veren yetersizliği gibi risk faktörleriyle ilişkili bulunmuştur. Psikiyatrik tanı oranı oldukça yüksek (%77,1) olup ergenlerde belirgin artış göstermekte; en sık PTSB, DEHB ve komorbid durumlar gözlenmektedir.

Bulgular, sağlık tedbiri kararlarının ağırlıklı olarak istismar/ihmal kaynaklı olduğunu ve düzenli psikiyatrik takip ile psikotrop tedavi ihtiyacının yüksek olduğunu vurgulamaktadır. Bu sonuçlar, çocuk koruma sisteminde erken müdahale, aile destek programları ve çok disiplinli yaklaşımın önemini bir kez daha ortaya koymaktadır. Çalışma, Türkiye'de sağlık tedbiri kapsamındaki çocukların ruh sağlığı profilini üniversite hastanesi bağlamında belgeleyerek literatüre katkı sağlamakta; gelecekte çok merkezli ve prospektif çalışmalarla bu verilerin genişletilmesi önerilmektedir.

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Etik Kurul Onayı: Çalışma için Bolu Abant İzzet Baysal Üniversitesi Girişimsel Olmayan Klinik Araştırmalar Etik Kurulu tarafından 12.08.2025 tarih ve 2025/329 karar numaralı onay alınmıştır.

Hasta Onayı: Retrospektif tasarım nedeniyle olgulardan veya yasal temsilcilerinden ayrıca bilgilendirilmiş onam alınmamıştır; tüm veriler anonimleştirilerek ve gizlilik ilkelerine uygun şekilde işlenmiştir.

Dipnotlar

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Technology Involvement in Child Sexual Abuse: Characteristics and Psychiatric Implications

Çocuk Cinsel İstismarında Teknolojinin Rolü: Özellikler ve Psikiyatrik Sonuçlar

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ABSTRACT

Objectives: This study examined the prevalence and patterns of digital technology involvement in contact child sexual abuse (CSA). We also investigated whether online-facilitated CSA cases exhibit unique characteristics and psychiatric consequences compared with cases without digital-technology involvement.

Materials and Methods: A retrospective review of medical records was undertaken for 1,755 sexual abuse victims under 18 years of age who were referred by the court. The comprehensive evaluation process included interviews with the victims and their parents, along with psychiatric examinations. Victims were categorized as "online-facilitated CSA" if the offender had utilized digital technologies, and a comparison was conducted with CSA cases not involving digital technology.

Results: 12% (n=212) of contact CSA victims also experienced online-facilitated CSA. Over half of the victims encountered perpetrators online before meeting them face-to-face. Notably, 45% had explicit images recorded, 38% experienced threats, and 11% were abused by individuals who were privy to the digital records. Online CSA victims, mainly adolescents and females, endured more severe and repetitive abuse, physical violence, and threats compared with offline CSA victims. They also exhibited higher rates of psychiatric disorders.

Conclusion: The results of this study indicate that digital technologies can be used to initiate and perpetuate CSA and may be associated with more severe psychiatric outcomes. Education for children and parents, professional training, and policy adaptation for a holistic approach are essential to prevent both offline and online CSA.

Keywords: Digital technology, internet, children, sexual abuse, psychopathology

ÖZ

Amaç: Bu çalışmada, dijital teknolojilerin istismarcı tarafından çocuk cinsel istismarına (ÇCİ) dahil edilme oranı ve kullanım amacı araştırılmıştır. Ayrıca, dijital destekli ÇCİ mağdurlarının dijital teknolojilerin istismara dahil edilmediği olgular ile istismara ait özellikler ve psikiyatrik sonuçları bakımından kıyaslanması hedeflenmiştir.

Gereç ve Yöntem: Mahkeme tarafından yönlendirilen 18 yaş altı 1.755 ÇCİ mağduruna ait adli raporlar retrospektif olarak incelenmiştir. Kapsamlı değerlendirme süreci, mağdurlar ve ebeveynleri ile yapılan görüşmeleri ve psikiyatrik muayeneleri içermiştir. Mağdurlar, istismarcının dijital teknolojileri kullandığı ve kullanmadığı olgular olarak iki gruba ayrılarak karşılaştırılmıştır.

Bulgular: Bu çalışmada, ÇCİ mağdurlarının %12'sinde (n=212) dijital teknolojiler istismarcı tarafından istismara dahil edilmiştir. Bu mağdurların yarısından fazlası istismarcı ile yüz yüze buluşmadan önce çevrimiçi ortamda tanışmışlardır. Ayrıca, %45'inin cinsel içerikli görüntüleri kaydedilmiş, %38'i kaydedilen görüntüler ile tehdit edilmiş ve %11'i dijital kayıtlardan haberdar olan başka kişiler tarafından istismara uğramıştır. Dijital teknolojilerin istismara dahil edildiği grupta örneklemin geri kalanına kıyasla kız cinsiyet, ergen yaş grubu, tekrarlayıcı istismar, fiziksel şiddet/tehdide maruz kalma ve psikiyatrik bozukluk oranı anlamlı derecede daha yüksek bulunmuştur.

Sonuç: Çalışmanın sonuçları dijital teknolojilerin ÇCİ'yi başlatmak ve sürdürmek amacıyla kullanılabildiğini ve daha ciddi psikiyatrik sonuçlar ile ilişkili olabildiğini göstermektedir. Çocukların, ebeveynlerin ve profesyonellerin eğitimi ve politikaların geliştirilmesi çevrimiçi ve çevrimdışı çocuk istismarını önlemede büyük öneme sahiptir.

Anahtar Kelimeler: Dijital teknoloji, internet, çocuklar, cinsel istismar, psikopatoloji

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Introduction

Over the past three decades, the Internet has become an essential and beneficial medium for children, offering unprecedented opportunities for learning, creativity, communication, and social engagement. Through educational platforms, online games, and social media, children can access vast resources, develop digital literacy, and connect with peers across the globe. However, alongside these benefits, it is essential to recognize that digital environments also carry significant risks, particularly when used without adequate supervision or safeguards. The same features that make digital platforms attractive—such as accessibility, anonymity, and interactivity—can also render children vulnerable to various forms of online harm. These include exposure to inappropriate content, cyberbullying, online grooming, coercion, sextortion, and exploitation by individuals who may misrepresent their identity. The integration of digital tools into offline child sexual abuse (CSA) introduces complex, multifaceted dynamics that challenge traditional understandings of abuse modalities.

According to international reports, digital technologies are involved in a significant proportion of CSA cases. For instance, the Internet Watch Foundation found a 64% increase in online CSA content reports in recent years,[1] while Europol has warned of the growing convergence between online and offline abuse modalities.[2] UNICEF has also highlighted that 1 in 3 Internet users globally is a child, many of whom are at risk of online grooming or exploitation.[3]

Offenders may exploit digital technology to initiate, facilitate, and maintain offline sexual abuse. Perpetrators can utilize various digital platforms to establish initial contact, groom victims, and manipulate them into engaging in offline sexual abuse.[4] The anonymity and accessibility provided by digital platforms facilitate offenders' targeting and exploitation of vulnerable children. Furthermore, the ability to record and disseminate CSA material through digital means introduces additional risks and challenges. The distribution and circulation of CSA material can have severe, long-lasting consequences for the child involved.

Online-facilitated CSA refers to the process of establishing or building a relationship with a child, either in person or via the Internet or other digital technologies, to facilitate online or offline sexual contact with that child. The online environment or digital technologies may be involved at any stage of the offence. Three forms of online-facilitated CSA have been defined: 1) online only; 2) online-to-offline, in which offenders initially make contact with victims through online platforms or communication technologies and then transition to offline interactions for further abuse. This group represents cases where digital technologies were primarily used as a means to establish initial contact and facilitate subsequent offline abuse; 3) offline progresses to online: the sexual abuse initially occurred through offline means, and later technology was introduced as a tool to exploit the victim or to record and disseminate CSA material.[5]

When explicit images or videos depicting a child's sexual abuse are disseminated, the child is subjected to enduring psychological trauma. The awareness that these materials are being viewed and shared by others intensifies the child's experience of shame, guilt, fear, and a sense of powerlessness.[6] This protracted trauma can have severe consequences, including the development of post-traumatic stress disorder (PTSD), depression, anxiety disorders, and various other psychological and emotional impairments.[7] Furthermore, the utilization of digital technologies in CSA was found to be significantly associated with a more severe form of abuse and an increased risk of revictimization.[4] The cases involving digital technologies may result in more complex and compounded psychiatric outcomes due to the persistent and often public nature of the abusive material. These cases may be uniquely associated with chronic shame, heightened anxiety, and identity-related disturbances stemming from the perceived permanence and uncontrollability of the digital footprint of abuse. This study makes a unique contribution to the existing literature by focusing on a subset of CSA cases that are often overlooked: those in which digital technology facilitated contact sexual abuse that was not confined to virtual interactions. Our findings, derived from examining the psychiatric profiles of these victims in comparison to non-digitally facilitated CSA cases, offer novel insights into the distinct psychological impacts of technology-enabled abuse. This perspective is crucial for tailoring clinical interventions and informing mental health professionals, law enforcement, and policymakers about the evolving nature of CSA in the digital era.

Despite the growing body of research on online CSA, there is a notable gap in the literature specifically addressing offline-contact CSA cases involving digital technology as a facilitating tool. This underexplored area requires greater attention, given its distinctive mechanisms and implications. The scarcity of studies in this area limits our understanding of the full spectrum of risks and consequences associated with digitally facilitated offline abuse.

The primary objective of this study was to explore the prevalence and patterns of digital technology involvement in facilitating contact sexual abuse within a diverse sample of sexually abused children and adolescents. Additionally, it examines whether online-facilitated CSA exhibits unique characteristics and psychiatric consequences compared with cases that do not involve digital technology. This research aims to gain a comprehensive understanding of this phenomenon by exploring the frequency and characteristics of offline CSA facilitated by digital technologies. Understanding the dynamics and outcomes of this form of abuse is crucial for developing effective prevention and intervention strategies to protect children from digital technology-enabled CSA.

Ultimately, the findings of this study have the potential to guide more effective identification, prevention, and trauma-informed treatment strategies by highlighting the unique psychological burden of digitally facilitated CSA, thereby contributing to improved outcomes for vulnerable children and adolescents.

Materials and Methods

The medical records of 1755 sexual abuse victims under the age of 18, referred by the court between January 2009 and December 2019, were retrospectively reviewed. According to Turkish criminal law, the court referred sexually abused children to child and adolescent psychiatry clinics for psychiatric evaluation.

Interviews With the Victims and Parents

Each sexually abused child and adolescent admitted to the clinics underwent a comprehensive evaluation process, which included interviews with the victims and their parents. The interviews covered a range of topics, including the victim's age, sex, and education level. The victims were asked to provide a detailed account of the sexual abuse they had endured, including the type, duration, and frequency of the abuse, the offender's identity, the number of offenders, and the use of digital devices (such as mobile phones, computers, cameras, etc.) in perpetrating the sexual abuse. Additionally, the presence of threatening or physical violence during the abuse was documented.

Psychiatric Examination

In addition to the interviews, a thorough psychiatric examination was conducted by an expert child and adolescent psychiatrist. The examination followed the diagnostic criteria outlined in the Diagnostic and Statistical Manual of Mental Disorders (DSM)-IV and DSM-V, enabling the identification and diagnosis of signs and symptoms of psychological distress, trauma-related responses, and other psychiatric conditions that may have resulted from the sexual abuse. Specialists in the department of forensic medicine performed general physical examinations of the children.

Participants

The study involved a comprehensive review of the medical records of all 1755 victims, all of whom were included in the analysis. The participants were categorized as "victims of online-facilitated CSA" if the offender utilized the online environment or digital technologies at any stage of the sexual abuse. A comparison was then made between victims of online-facilitated CSA and victims of CSA in which digital technologies were not involved. The study was conducted in accordance with the Declaration of Helsinki.

Statistical Analysis

The data obtained from the medical records were analyzed using IBM SPSS Statistics version 21.0 (IBM Corp. in Armonk, NY). Chi-square tests were employed to compare groups. Logistic regression analysis was performed to identify factors predicting the development of psychopathology following sexual abuse. A significance level of $p<0.05$ was used.

Ethics

The study was approved by the Committee for Clinical Research Ethics of Ondokuz Mayıs University (approval number: 2024/454, date: 01.02.2024).

Results

Out of the 1755 children included in the study, 12% (n=212) had experienced the offender's use of digital technologies at any stage of the abuse (online-facilitated CSA). The relationship between the offender and the victim was initiated via the online environment, such as social media, in 55.7% of the cases. Nearly half of the children were also exposed to online sexual abuse. Sexual abuse material was recorded by the offender for 46% of online-facilitated CSA victims. A considerable proportion of online-facilitated CSA victims (nearly 40%) were also threatened with the recorded material, whereas the material was disseminated online in 15.5% of cases. The ways and rates of online technology use in abuse are presented in Table 1 and Figure 1.

When the study sample was divided into two groups— "online-facilitated CSA" and "offline CSA"— significant differences were observed across all variables. In the online-facilitated CSA group, nearly all victims were adolescents (99%) and female (94.8%). The online-facilitated CSA group also experienced more severe abuse patterns, including significantly higher rates of penetrative abuse (69% vs. 41%), longer abuse duration (55.7% vs. 40%), and higher rates of repeated victimization (72.6% vs. 46.2%). The rates of psychiatric disorders (88.2% vs. 64%), threats (100% vs. 24.2%), and violence (33.5% vs. 17.8%) were also significantly higher in the online-facilitated CSA group than in the offline CSA group (Table 2).

Logistic regression analysis identified several significant predictors of psychopathology among sexually abused children. Being younger than 12-years-old significantly increased the likelihood of developing a psychiatric disorder; children under 12 were 1.66 times more likely to develop psychopathology than older victims [B=0.506, $p<0.001$, odds ratio (OR)=1.658]. Female gender was also a strong predictor: girls had a twofold higher risk of psychopathology than boys (B=0.725, $p<0.001$, OR=2.065).

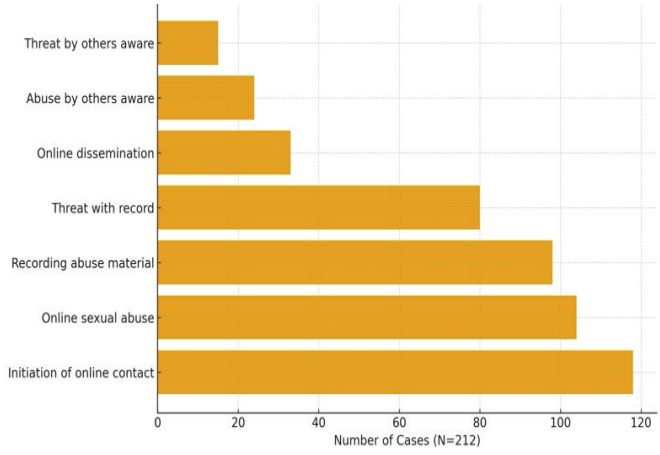

Figure 1. Involvement of digital technologies in offline CSA (n=212)
CSA: Child sexual abuse

Exposure to penetrative abuse significantly increased the odds of psychopathology (B=0.519, p<0.001, OR=1.680). Physical violence and threats emerged as the strongest predictors in the model; children subjected to violence or intimidation were over 10 times more likely to develop psychiatric disorders (B=2.367, p<0.001, OR=10.670). Experiencing abuse by multiple offenders also significantly increased the risk of psychopathology, raising the likelihood by 2.50 times (B=0.917, p<0.001, OR=2.501). Likewise, incestuous abuse substantially elevated the risk that victims of incest had 1.86 times higher odds of developing psychiatric pathology (B=0.620, p=0.003, OR=1.858).

Regression analysis revealed that the involvement of digital technology was a significant independent predictor of psychopathology. After adjusting for demographic and abuse-related variables, victims whose abuse involved digital technologies were approximately 1.88 times more likely to develop psychiatric disorders (B=0.633, p=0.027, OR=1.883) (Table 3). Figure 2 also shows ORs and 95% confidence intervals for significant predictors of psychopathology in CSA victims.

Discussion

This study explored the unique characteristics of online-facilitated CSA cases and compared them with cases without digital technology involvement. The study examined the association of offenders' technology utilization with the severity of contact sexual abuse and with the incidence of psychopathology among victims. Furthermore, we aimed to investigate whether the involvement of technology in contact CSA was associated with the development of psychopathology.

Table 1. Involvement of digital technologies in offline CSA

	n (total: 212)	%
Initiation of offender-victim relationship in the online environment	118	55.7%
Online sexual abuse	104	49.1%
Recording sexual abuse material	98	46.2%
Threatening the victim with the sexual abuse record	80	37.7%
Disseminating sexual abuse material in an online environment	33	15.5%
Sexual abuse by other offenders who knew the record	24	11.3%
Threatened by those who knew the record	15	7.1%

Percentages represent the proportion of victims within the online-facilitated CSA group (n=212) who reported each form of digital technology involvement. Categories are not mutually exclusive; victims may have experienced more than one form of digital exploitation. CSA: Child sexual abuse

Table 2. Comparison of online-facilitated contact CSA victims with offline CSA victims

Variable	Online-facilitated CSA (n=212)	Offline CSA (n=1543)	χ^2	p
Age <12 Age ≥12	2 (1%) 210 (99%)	341 (22%) 1202 (78%)	53.056	<0.001
Female	201 (94.8%)	1225 (79.4%)	29.098	<0.001
Penetrative abuse	146 (69%)	645 (41%)	55.155	<0.001
Duration ≤1 month Duration >1 month	94 (44.3%) 118 (55.7%)	928 (60.1%) 615 (40%)	19.138	<0.001
Partner/boyfriend	103 (48.6%)	268 (17.4%)	119.340	<0.001
Acquaintance	89 (42%)	876 (56.8%)	52.100	<0.001
Stranger	2 (1%)	195 (12.6%)	54.515	<0.001
First-degree relative	18 (8.5%)	204 (13.2%)	4.810	<0.001
Recurrent sexual abuse	154 (72.6%)	713 (46.2%)	28.909	<0.001
Multiple offenders	56 (26.4%)	143 (9.3%)	49.238	<0.001
Threatening	212 (100%)	374 (24.2%)	132.212	<0.001
Physical violence	71 (33.5%)	275 (17.8%)	22.592	<0.001
Psychiatric disorder subtype • PTSD + depression • Depression • PTSD	 117 (55.2%) 44 (20.8%) 23 (10.8%)	 346 (22.4%) 234 (15.2%) 341 (22.1%)	52.917 — — —	<0.001 — — —
Suicide attempt	24 (11.3%)	60 (3.9%)	20.991	<0.001

Group differences were assessed using Pearson's chi-square test. A p-value of <0.05 was considered statistically significant. CSA: Child sexual abuse, PTSD: Post-traumatic stress disorder

Table 3. Factors predicting the development of psychopathology

	B	SE	Wald	df	Sig.	OR	95% CI
<12 years old	0.506	0.142	12.645	1	0.000	1.658	1.25-2.20
Female gender	0.725	0.148	23.992	1	0.000	2.065	1.55-2.75
Penetration	0.519	0.125	17.169	1	0.000	1.680	1.31-2.15
Physical violence and threats	2.367	0.196	146.239	1	0.000	10.67	7.26-15.68
Multiple offenders	0.917	0.252	13.285	1	0.000	2.501	1.53-4.09
Incest	0.620	0.205	9.101	1	0.003	1.858	1.24-2.78
Involvement of digital technology	0.633	0.286	4.904	1	0.027	1.883	1.07-3.31
Recurrence of abuse	0.013	0.124	0.011	1	0.917	0.987	0.78-1.25

Logistic regression identified independent predictors of psychopathology; exp (B) values represent odds ratios. Significance was set at $p<0.05$. OR: Odds ratio, CI: Confidence interval, SE: Standard error, Sig.: Significance

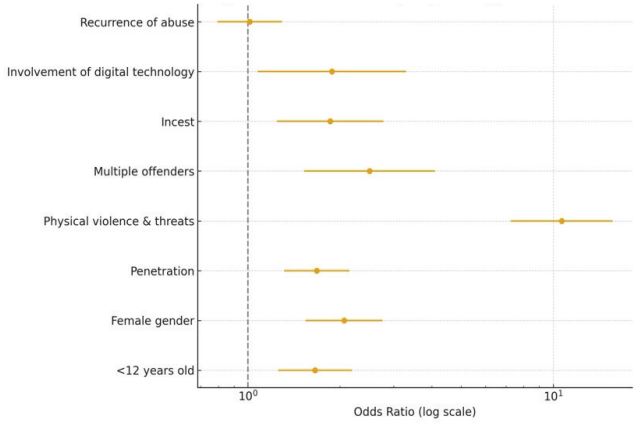

Figure 2. Predictors of psychopathology in CSA victims
CSA: Child sexual abuse

In this study, the proportion of offenders who incorporated digital technologies into offline abuse was 12%. In a previous research, the rate of online-facilitated CSA was found to be similarly 14% among victims of CSA under the age of 18.[4] This comparable prevalence rate underscores the growing significance of digital tools as adjuncts to traditional forms of CSA, reflecting a persistent and evolving risk in the digital era.

One striking finding of the study is that 55.7% of victims of online-facilitated contact CSA had encountered the perpetrator online. Online grooming, a process enabled by technology, involves an adult perpetrator intentionally befriending a vulnerable young individual with the explicit aim of initiating sexual abuse and exploitation.[5] A comprehensive survey investigating the online behaviors of children and adolescents across European countries revealed that 16% of adolescents reported having met someone in person whom they had initially encountered online. Among the adolescents who engaged in offline meetings, 11% disclosed instances of inappropriate sexual conduct.[8] In a recently published study, it was reported that 8.5% of adults who experienced childhood sexual abuse had encountered their abusers through social media or online platforms.[9] These results suggested that online communication provides offenders with easy access to victims, acting as a gateway that facilitates the transition from online relationships to face-to-face contact and ultimately leads to offline sexual abuse of the child. These results highlight that online communication not only facilitates initial contact but also is a high-risk vector for the transition to offline abuse. This finding suggests that prevention strategies should address the "continuum of victimization," starting from the first digital interaction through to potential offline contact. Moreover, the accessibility and anonymity provided by digital platforms lower the barriers for offenders, enabling them to reach multiple potential victims simultaneously, which may increase the scope and frequency of abuse attempts.

Approximately half of the cases of exploitation through digital technologies involved online sexual abuse in addition to contact CSA, primarily through sexually explicit messages and images. Moreover, 45% of the online-facilitated CSA victims indicated that the offender recorded images of contact sexual abuse, 38% reported being threatened with these images, and 15% stated that these images were shared with others in the online environment. Furthermore, 7% of the online-facilitated contact CSA victims reported that they were threatened by individuals who knew the records, and 11% reported that they were sexually abused by other offenders who knew the records. This pattern reveals the multilayered victimization inherent in digitally facilitated CSA, where initial abuse is compounded by ongoing threats, coercion, and secondary abuse by third parties. Such dynamics extend the duration and complexity of trauma, often preventing psychological closure for the victim. These findings indicate that the recording and dissemination of CSA material sustains the victimization of children. Once the material is recorded and shared online, it becomes subject to replication, downloading, and widespread distribution, leading to the child's ongoing victimization as the material continues to circulate. This underscores the need for integrated interventions that combine law-enforcement actions, digital forensics, and victim-support services, all aimed at the rapid removal of abusive content from online platforms.

Compared with victims of offline CSA, those who experienced online-facilitated contact CSA exhibited significant differences on all variables examined in the study. The online-facilitated CSA group primarily consisted of adolescents aged 12 and

above, with a significantly higher proportion of female victims. Similar to our results, several studies in the literature indicated that girls and adolescents are more prone to experiencing online sexual abuse compared to boys and children under the age of 12.[10] These age and gender disparities are crucial for targeted intervention planning. Adolescents, particularly females, appear to be at greater risk due to higher digital engagement and increased susceptibility to online social validation. This underlines the necessity of age-appropriate digital literacy education and gender-sensitive prevention programs.

One noteworthy finding was that a significant proportion of individuals who engaged in online-facilitated contact CSA were identified as boyfriends. Cyber dating abuse encompasses a range of harmful behaviors perpetrated within romantic relationships through digital means. This includes not only emotional and psychological manipulation but also sexual aggression. This category of violence extends to various actions, such as pressuring a partner into engaging in face-to-face or online sexual activities, sending unsolicited sexual content, using coercion or threats to obtain sexual media, and distributing this content to a wider audience.[11,12] The framing of abuse within a romantic context can normalize coercive behaviors, making victims less likely to identify themselves as abused and more hesitant to disclose their experiences. Victims may not recognize the coercive nature of the interaction due to emotional attachment, resulting in delayed help-seeking and heightened psychological consequences such as guilt, confusion, and betrayal trauma. The study sheds light on the broader issue of how technology can be used to perpetrate sexual aggression within adolescents' intimate relationships, highlighting the blurred lines between offline and online forms of abuse. This underscores the need for educational campaigns that help adolescents recognize the signs of abuse even in romantic relationships they perceive as consensual.

Victims of online-facilitated contact CSA were more likely to endure penetrative, repetitive forms of abuse, as well as physical violence and threats, than victims of offline CSA. This suggests that digital facilitation not only increases access but also escalates the intensity of abuse, possibly because offenders feel emboldened by the psychological control they establish before physical contact. The use of digital technologies by offenders appears to increase the severity of abuse by providing them with a platform to perpetrate more invasive and persistent harm. Moreover, the online environment enables offenders to exert control and coercion over their victims through various means, including threats and intimidation.

A higher incidence of psychiatric disorders and suicide attempts was noted in this group. From a clinical perspective, these findings suggest that the involvement of digital technology in CSA may not only increase the quantitative burden of trauma but also qualitatively alter the nature of the traumatic experience. Digitally facilitated CSA often transforms abuse from a time-limited event into an ongoing process, as abusive images, messages, or videos can be stored, copied, and disseminated indefinitely.[6,13-15] The awareness or even suspicion that such material may still be circulating online maintains a chronic sense of threat and uncontrollability, which are central mechanisms in the development and persistence of PTSD.[6,13,14] This persistent perceived danger can exacerbate core PTSD symptoms such as intrusive re-experiencing, hypervigilance, avoidance, and negative alterations in cognitions and mood.

Furthermore, the existence of a digital record of the abuse introduces a powerful and enduring social-evaluative component. Victims may fear being recognized by peers, family members, or strangers who might have seen or could potentially see the material, leading to pervasive shame, humiliation, and self-blame.[6,14-17] These emotions are well-established contributors to the development of depression and other internalizing disorders following CSA.[7,15,16] The sense of irreversible damage to one's reputation and identity in the digital sphere can fuel hopelessness, social withdrawal, and feelings of worthlessness, thereby increasing vulnerability to major depressive episodes and suicidal ideation.

The recurrent and potentially lifelong possibility of re-exposure to the abuse material also creates what has been described as "recurrent digital traumatisation," whereby victims experience ongoing retraumatisation through reminders of the abuse, the threat of rediscovery, or renewed dissemination of the images.[13-15] Unlike traditional offline CSA, where the abusive event is temporally bound, online-facilitated CSA may be experienced by the victim as "never fully over," sustaining a chronic state of anticipatory anxiety and undermining the natural recovery process. Taken together, these mechanisms provide a plausible explanation for why psychiatric disorders, particularly PTSD and depression, are observed at higher rates among victims of online-facilitated CSA compared with those exposed to offline CSA only.[4,6,13-16]

The logistic regression analysis offers valuable insight into the connection between digital technology involvement in CSA and the development of psychiatric disorders. Although previous studies,[4,7,14-16] have linked digital documentation to heightened psychological harm, few have quantified its independent predictive power after controlling for abuse severity and victim demographics, as in our study. This positions our findings as an important step toward establishing digital facilitation as a distinct risk factor in CSA psychopathology research. Even after controlling for age, gender, penetration, threats, physical violence, incest, and multiple perpetrators, digital technology remained a significant risk factor, nearly doubling the likelihood of psychiatric disorders. This finding emphasizes that the digital dimension of CSA may represent a qualitatively distinct subtype of abuse, with unique mechanisms of psychological harm—such as persistent fear of exposure, shame associated with image circulation, and continuous retraumatization through online reminders—that warrant specialized therapeutic approaches. This indicates that online-facilitated CSA may not merely be an extension of traditional offline CSA but a distinct and potent risk factor in itself. The digital environment provides offenders with unique opportunities and mechanisms to exert control, manipulate, and escalate abuse, potentially leading

to more severe psychological trauma for the victims. A study has shown that victims who are aware of the existence or distribution of abusive images online experience elevated levels of posttraumatic stress symptoms compared to those who have been exposed to CSA without digital documentation.[13] Children and adolescents who were subjected to sexual abuse that incorporated digital elements were found to be 4.21 times more likely to develop various forms of psychopathology. Specifically, they exhibited a 3.77-fold higher likelihood of experiencing depression and a 2.14-fold increased risk of developing PTSD as a consequence of the sexual abuse they endured.[4] Previous investigations indicated that the digital aspect of abuse could potentially impact the psychological outcome, leading to revictimization through the further dissemination of images,[14] heightened feelings of shame, self-blame, and betrayal,[6] a decline in self-esteem, increased shame and isolation,[15] as well as amplified experiences of depression and anxiety.[16] These findings highlight the need for clinicians to systematically assess technology-related elements during evaluations and incorporate digital-trauma-specific components into treatment plans, such as addressing fears of exposure, shame linked to image circulation, and the victim's perceived loss of control over their digital identity.

The findings of the present study suggest that several factors may be associated with an increased risk of developing psychopathology among child abuse victims, including younger age, female gender, exposure to physical violence and threats, incestuous abuse, and multiple perpetrators. These results are consistent with previous literature emphasizing the role of victim characteristics and abuse severity in determining psychiatric outcomes.

Younger age at the time of abuse has been consistently linked to more profound and long-lasting mental health consequences, likely due to the limited cognitive and emotional capacity of younger children to process trauma.[17] Female victims, in particular, are more likely to develop internalizing disorders such as depression, anxiety, and PTSD, possibly due to both biological and sociocultural factors.[18,19]

The presence of physical violence and verbal threats during abuse has been shown to intensify the traumatic experience, increasing the likelihood of PTSD, hyperarousal, and dissociation.[20,21] Furthermore, incestuous abuse is widely recognized as a particularly harmful subtype of sexual abuse, often associated with betrayal trauma and complex PTSD.[22] The involvement of multiple perpetrators may exacerbate feelings of helplessness and hopelessness in the child, contributing to more severe psychopathological outcomes.[23]

Taken together, these psychiatric implications highlight a pressing need for trauma-focused therapies that specifically address components of digital exploitation. Such interventions should target shame, image-related anxiety, and the enduring fear of online exposure, while also accounting for the compounding effects of traditional high-risk abuse characteristics. This dual focus will allow clinicians to address both the unique harms of online-facilitated CSA and the broader psychosocial consequences of severe abuse.

Study Limitations

Several limitations of this study should be acknowledged. First, the study was designed as a retrospective chart review, and all data were obtained from existing medical and forensic records. Although face-to-face interviews were conducted at admission, these interviews were part of routine clinical and forensic evaluations and were not performed within a prospective research framework. No additional interviews were conducted specifically for this study. This retrospective design limits the ability to establish temporal relationships between exposure and outcome variables.

The assessment of digital technology involvement was based on documentation in clinical and forensic records, and was not conducted using a standardized assessment tool during the study period (2009-2019). Given the long study period and the rapid evolution of digital technologies, variations in documentation practices may have introduced information bias.

Psychiatric diagnoses were made according to DSM-IV criteria in earlier years and DSM-5 criteria in later years of the study period, reflecting routine clinical practice at the time of evaluation. Diagnoses were analyzed as recorded in the files and not retrospectively harmonized across DSM versions. Because diagnostic definitions and thresholds changed between DSM-IV and DSM-V, diagnostic inconsistency and potential misclassification cannot be excluded, particularly in the regression analyses.

Psychiatric diagnoses were based on clinical evaluations rather than standardized diagnostic instruments. Inter-rater reliability could not be assessed, and diagnostic practices may have varied across clinicians and over time. This limitation is inherent to retrospective chart reviews and should be considered when interpreting the findings.

All participants in the study were victims of CSA. The comparison was conducted only between abused children with and without documented digital technology involvement, and no non-abused or community control group was included. Therefore, the findings do not allow conclusions about psychiatric risk in the general population and should instead be interpreted as differences observed within a population already exposed to abuse.

Although logistic regression analyses were performed to examine associations between digital technology involvement and psychiatric outcomes, these analyses demonstrate statistical associations and do not establish causality. Potential overlap between variables such as threats, physical violence, and digital recording cannot be fully ruled out, and formal model diagnostics were limited by the retrospective nature of the data. Accordingly, the regression results should be interpreted cautiously.

Digital technology involvement in CSA is a heterogeneous phenomenon. Although conceptual distinctions between

online sexual abuse, online-facilitated offline abuse, and offline abuse with secondary digital elements such as recording or dissemination are clinically important, these categories may not always be clearly separable in retrospective records. In the present study, digital technology involvement primarily refers to offline sexual abuse cases with secondary digital elements; this should be taken into account when interpreting the results.

These limitations point to important directions for future research. Prospective longitudinal studies are critically needed to examine how digital technologies shape the trajectories of trauma, symptom development, and recovery. Such research could clarify whether digital facilitation contributes to delayed improvement, chronic PTSD, or long-term functional impairment. Additionally, cross-cultural comparative studies are needed to determine how sociocultural environments influence patterns of online grooming, disclosure behaviors, and mental health outcomes. Future work should also investigate how specific technological features—such as social media design, anonymity affordances, or algorithmic content exposure—affect risk and resilience among child and adolescent victims.

Conclusion

This study has illuminated the substantial role that digital technology plays in enabling and prolonging the offline sexual abuse of children. Moreover, our findings indicate a notable link between engagement with digital technologies in CSA and an elevated susceptibility to psychopathology.

The findings of this study have important implications for both immediate and long-term concerns related to child protection and mental health. In the short term, the high severity and complexity of online-facilitated CSA cases highlight the need for rapid identification of digital involvement during clinical and forensic assessments. Early detection of recorded material, threats, or online grooming can guide appropriate safety planning and urgent interventions.

The findings of this study highlight the critical importance of adopting a comprehensive and multidisciplinary approach to respond to online-facilitated CSA. From a clinical standpoint, mental health services must incorporate trauma-informed care models that directly address the unique psychological consequences of digital exploitation. These models should be sensitive to the persistent fear of exposure associated with the circulation of abusive images or videos, the chronic shame stemming from the victim's perceived loss of control over their digital identity, and the heightened anxiety resulting from the ongoing potential for revictimization through online dissemination.

Routine psychiatric assessments of CSA survivors should be updated to include structured inquiries regarding the involvement of digital technologies in the abuse process. Identifying digital components early in the assessment process is vital, particularly because victims of online-facilitated CSA are more likely to have experienced repeated abuse, penetrative acts, and threats, and to have higher rates of suicide attempts and psychiatric comorbidity. Such risk factors necessitate timely referrals to specialized trauma-focused interventions. Evidence-based therapies, such as trauma-focused cognitive behavioral therapy and eye movement desensitization and reprocessing, should be adapted to incorporate components that specifically address digital trauma, including fears related to online permanence and image-based retraumatization.

Beyond the clinical setting, the study emphasizes the need for educational institutions to implement structured and age-appropriate digital safety programs. These should include digital literacy education, safe online behavior training, and relational awareness to help adolescents—especially girls—recognize manipulative behaviors, even when disguised as consensual or romantic interactions. Parents must also be included in the preventive framework. Public education campaigns and structured parental training should aim to increase awareness of online grooming tactics, sextortion, and signs of digital sexual abuse, empowering caregivers to intervene early and support victims effectively.

At the policy level, a coordinated response involving lawmakers, technology companies, child protection services, and law enforcement is essential. Legislative measures should establish strict responsibilities for digital platforms regarding the rapid identification and removal of CSA material, mandatory reporting obligations, and the enforcement of age-appropriate platform access. Policies must also ensure that child protection professionals receive specialized training in detecting and responding to online-facilitated CSA, including competencies in digital forensics, risk assessment, and inter-agency collaboration.

Beyond their role in facilitating CSA, digital technologies also possess significant potential as tools for prevention, early detection, and intervention. This dual capacity should be recognized when interpreting the study's findings. While offenders exploit features such as anonymity, unrestricted communication, and media-sharing functions to groom or coerce victims, the same technological infrastructure can be leveraged to protect children. Monitoring systems and algorithm-based detection tools used by technology companies can help identify grooming behaviors, flag suspicious communication patterns, and detect the circulation of illegal content in real time. Public awareness campaigns delivered through digital platforms can improve adolescents' knowledge of online risks, enhance their digital literacy, and empower them to recognize and report inappropriate interactions. Additionally, platform-level interventions—such as age verification mechanisms, default privacy protections, rapid reporting tools, and automated blocking of suspected predators—offer scalable strategies for reducing opportunities for online-facilitated CSA. Understanding this dual role underscores the need for collaborative approaches involving mental health professionals, educators, policymakers, and technology companies. It also highlights the importance of developing prevention frameworks that harness the protective potential of digital technologies while mitigating their misuse.

In sum, this study reinforces the urgent need for an integrated clinical, educational, and policy framework that addresses both the psychological impacts and the systemic challenges of online-facilitated CSA. Recognizing the distinctive mechanisms of digital exploitation is fundamental to improving identification, intervention, and recovery outcomes for children and adolescents affected by this evolving form of abuse.

Ethics

Ethics Committee Approval: The study was approved by the Committee for Clinical Research Ethics of Ondokuz Mayıs University (approval number: 2024/454, date: 01.02.2024).

Informed Consent: Retrospective study.

Footnotes

Authorship Contributions

Surgical and Medical Practices: G.N.S., Concept: G.N.S., A.T., B.A., Design: G.N.S., A.T., B.A., Data Collection or Processing: G.N.S., A.T., B.A., U.T., Analysis or Interpretation: G.N.S., A.T., B.A., U.T., Literature Search: G.N.S., Writing: G.N.S.

Conflict of Interest: The authors declare no conflicts of interest.

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Recurrent Psychotic Mixed Mania in a Child Triggered by Clarithromycin and Amoxicillin Use: A Rare Case of Pediatric Antibiomania

Klaritromisin ve Amoksisilin Kullanımı Sonrası Gelişen Tekrarlayıcı Psikotik Karma Mani: Nadir Bir Pediatrik Antibiyomani Olgusu

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ABSTRACT

The term antibiomania is used for manic episodes resulting from antibiotic use. Although some cases of antibiomania have been reported in the literature in various age groups, childhood cases of antibiomania are quite limited. In this article, a case of a 12-year-old boy with no previous mood disorder who developed mania with mixed and psychotic features after using clarithromycin or amoxicillin at three different times was presented. This case is a rare example of pediatric antibiomania that differs from previously reported antibiomania cases by having mixed and psychotic features of the manic episode. With this case report presentation, it was aimed to emphasize that mania can develop following antibiotic use without any genetic or organic risk factors, that antibiomania in children can have a recurrent nature, and that careful clinical evaluation and consideration of risk factors such as medication use are important for making a diagnosis in this age group.

Keywords: Antibiomania, clarithromycin, amoxicillin, psychotic mixed manic episode, child

ÖZ

Antibiyomani terimi antibiyotik kullanımına bağlı manik ataklar için kullanılır. Literatürde çeşitli yaş gruplarında antibiyomani olguları bildirilmiş olmakla birlikte çocukluk çağı antibiyomani olguları oldukça sınırlıdır. Bu yazıda, daha önce duygudurum bozukluğu olmayan 12 yaşında bir erkek çocukta üç farklı zamanda klaritromisin veya amoksisilin kullanımı sonrası karma ve psikotik özellikler gösteren mani tablosunun gelişmesi sunulmuştur. Bu olgu, manik atağın karma ve psikotik özellikler göstermesiyle daha önce bildirilen antibiyomani olgularından ayrılan nadir bir pediatrik antibiyomani örneğidir. Bu olgu sunumuyla, antibiyotik kullanımıyla maninin genetik veya organik risk faktörü olmadan da gelişebileceği, çocuklarda antibiyomaninin tekrarlayıcı bir yapıya sahip olabileceği ve bu yaş grubunda tanı koymada dikkatli klinik değerlendirmenin ve ilaç kullanımı gibi risk faktörlerinin göz önünde bulundurulmasının önemli olduğu vurgulanmak istenmiştir.

Anahtar Kelimeler: Antibiyomani, klaritromisin, amoksisilin, psikotik özellikli karma manik epizod, çocuk

Introduction

Mania that occurs after antibiotic use is called antibiomania. This rare phenomenon is gaining increased recognition due to a growing number of published case reports.[1] Antibiomania is most commonly observed with macrolide antibiotics, especially clarithromycin, and with fluoroquinolones such as ciprofloxacin and ofloxacin.[2-5] It generally develops within a few days of starting antibiotic use and resolves rapidly when the antibiotic is discontinued.

Although the precise pathophysiological mechanism of antibiomania remains unclear, proposed hypotheses include GABA-A receptor inhibition, disruption of inhibitory neurotransmission within the central nervous system, and alterations in prostaglandin levels leading to neuroinflammation.[6]

The cases reported in the literature to date are mostly occur in adulthood, and there are only a few case reports in children and adolescents.[7] In most cases, a single manic episode has been reported, and recurrent manic episodes are rare.

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Therefore, this case of antibiotic-induced recurrent manic episodes with psychotic features in the pediatric age group, without any genetic or psychiatric risk factors, is noteworthy.

This case report discusses three episodes of psychotic and mixed manic symptoms in a 12-year-old boy, each occurring after treatment with clarithromycin or amoxicillin. This case exemplifies that antibiotic-related neuropsychiatric side effects can also occur in childhood and can have a recurrent course.

Case Report

A 12-year-old patient diagnosed with attention deficit hyperactivity disorder (ADHD) who had not taken any medication, at the request of his family, presented to the Child and Adolescent Psychiatry Outpatient Clinic at the University of Health Sciences Türkiye, Erenköy Mental and Nervous Diseases Training and Research Hospital three times in the last three months, complaining of decreased need for sleep, excessive talking and increased energy. The patient first visited our clinic 10 days after the third attack, after the pediatric neurologist referred the patient to a child psychiatrist. When he applied to the clinic, the patient had no active complaints. A historical assessment was conducted.

The first attack occurred approximately three months before the outpatient clinic application. A diagnosis of upper respiratory tract infection was made based on complaints such as fever, nasal discharge and difficulty swallowing. The patient was prescribed clarithromycin 250 mg twice daily and ibuprofen/pseudoephedrine 200 mg twice daily after applying to the pediatrician. After using the medicines for one day, there was a decrease in the need for sleep and a significant increase in energy levels. He walked around all night. He laughed to himself at night and cried during the day. He was very angry and hostile towards the people around him. His speech became faster and more voluminous, and he had flight of ideas, saying that his power was enough for everything. He said that he was receiving a signal and that everything in the house smelt bad. The family did not seek medical attention during this period and discontinued the medication after four days. The complaints gradually decreased and there were no symptoms after one week. The retrospective Young Mania Rating Scale/Parents form (YMRS-P) total score was 47. This score is consistent with a manic episode.

Approximately one month after the first episode, a pediatrician prescribed oxymetazoline HCl 0.05% spray twice daily, benzydamine HCl + chlorhexidine gluconate mouth spray four times daily and amoxicillin-clavulanic acid 400/57 mg twice daily for an upper respiratory tract infection. The day after he started taking the medication, he needed less sleep and had significantly more energy. He was crying and unhappy, and he wasn't talking to people or interacting with those around him during the day. He did not want to go to school because he thought his classmates did not like him. At night, he was laughing for no reason. His speech speed and volume increased again. People around him found it difficult to follow his train of thought. He thought he was superior to others. The family used antibiotics for one and a half days. After discontinuing the antibiotic use, the symptoms decreased and ended after two days. Meanwhile, the YMRS-P was administered retrospectively based on parental reports, yielding a total score of 47. This score is consistent with a manic episode.

About one month after the second episode, he visited a pediatrician complaining of a sore throat, fever and cough. The pediatrician prescribed clarithromycin 250 mg twice daily for an upper respiratory tract infection. One day after taking the antibiotic, similar to previous episodes, there was a decrease in the need for sleep, an increase in energy levels, an increase in the speed and amount of speech, and aggressive behaviors appeared at night. He cried and felt upset during the day. The antibiotic was discontinued after three days due to symptom emergence. The symptoms persisted for approximately one week and resolved completely thereafter. There were no symptoms after a week. A retrospective YMRS-P total score of 36 was obtained based on parental reports. This score is consistent with a manic episode.

The patient underwent testing for a complete blood count, blood electrolytes, liver function, bilirubin levels, kidney function, thyroid function, blood glucose levels, C-reactive protein levels, and a complete urinalysis. The results revealed leukocytosis and an elevated C-reactive protein level, both of which are consistent with a bacterial infection. Following these episodes, the family consulted a pediatric neurologist, who could not identify any organic cause. No epileptiform activity was detected in the electroencephalography, and no lesions were found in the cranial magnetic resonance imaging scan.

The patient's first psychiatric visit occurred when he was in the first grade, when he was seven years old, due to a delay in learning to read and write. Following a psychiatric and psychometric evaluation, he was diagnosed with ADHD. He was gradually started on short-acting methylphenidate twice daily. He used the medication for approximately one and a half months. The family stopped administering the medication because the patient experienced emotional blunting as a side effect. Later, as the symptoms of ADHD persisted, he was started on a 27 mg long-acting dose of methylphenidate. After two to three months, when the observed benefit decreased, the dose was increased to 36 mg. However, after a teacher claimed that such medications are harmful to children, the family stopped using the medication.

The patient was born at term via C-section, weighing 3,500 grams, with no birth complications. He said his first words at nine months, formed his first sentences at two years of age, began walking at eleven months, and finished potty training at two years of age.

There was no known family history of psychiatric or mood disorders. Detailed questioning revealed that no one had been diagnosed with a mood disorder. His academic performance was age-appropriate, and no specific learning difficulties were reported.

He came to the interview at his mother's request. The patient reported no subjective complaints, and that he was angry with his mother for bringing him. Information was obtained from both the patient and his mother.

The patient's physical appearance and grooming were appropriate for his developmental age. The patient was fully oriented to time, place, and person. His mood was euthymic. He displayed an appropriate affect, congruent with mood and context. There were no suicidal or homicidal ideations, obsessions or delusions within his thought content. His thought process was normal. The patient's speech was spontaneous, with normal rate, rhythm, and volume. The patient's ADHD symptoms persisted, but his family said they did not want treatment.

It was thought that the patient, who had no history of mood disorders, experienced psychotic mania with mixed features induced by antibiotics.

Because the patient had no active symptoms when he arrived at our clinic and because his symptoms began shortly after he started taking antibiotics and subsided approximately one week after he stopped taking them, we did not initiate any medical treatment. The family received psychoeducation and information about risky antibiotic classes. They were also asked to inform their physicians about any previous manic episodes related to antibiotic use.

Because the manic episode was triggered by an antibiotic and the patient was young, he was referred to the child and adolescent psychiatry outpatient clinic for monitoring his risk of developing bipolar disorder.

Verbal assent was obtained from the child, and written informed consent was obtained from his parents.

Discussion

This case is of particular significance as it involves a rare adverse effect of antibiotic use, known as antibiomania, observed in a pediatric patient with psychotic and mixed manic features. While previous reports have described single episodes in adult patients, this case highlights that recurrent manic episodes related to antibiotic use may also occur in children without any underlying psychiatric or organic pathology.[7,8] The temporal association between the initiation of various antibiotics and the subsequent emergence of manic symptoms, followed by symptom resolution upon drug discontinuation, along with the absence of a family history of mood disorders, strongly supports a diagnosis of substance/medication-induced bipolar and related disorder rather than primary bipolar disorder. However, there are issues that need to be addressed in the differential diagnosis. When evaluating this case, it is important to consider not only the potential contribution of antibiotic treatment, but also that of a previous upper respiratory tract infection, to the onset of manic symptoms. Some researchers have suggested that viral infections, particularly respiratory infections, may indirectly affect the central nervous system and trigger manic episodes. This could occur through mechanisms such as neuroinflammation, increased cytokine levels, and activation of the hypothalamic-pituitary-adrenal axis. Indeed, the occurrence of manic episodes in individuals with no prior psychiatric history following a severe acute respiratory syndrome coronavirus 2 infection supports this view.[9] In each episode, the onset of manic symptoms occurred within 24 hours of starting antibiotic therapy. Although the patient had exhibited clinical signs of infection prior to treatment, no mood or behavioral changes were reported until antibiotic administration began. This consistent temporal pattern strengthens the argument for antibiotic-induced mania rather than a direct neuropsychiatric effect of the underlying infection; therefore, the episodes were considered to be associated with antibiotic exposure. The differential diagnosis should also consider any other medications the patient was taking during the episode. The patient used clarithromycin and pseudoephedrine together during the first episode and clarithromycin alone during the third. Although pseudoephedrine was co-administered during the first episode, the recurrence of a similar manic episode with clarithromycin alone, together with the consistent temporal relationship and symptom resolution after discontinuation, strongly supports clarithromycin as the primary precipitating agent.

Differential diagnosis should also include medications such as pseudoephedrine and nasal decongestants, which have previously been associated with manic episodes in children and adolescents.[10,11] Drug-induced mania related to various pharmacological agents has also been described in the literature.[12]

Clarithromycin, a macrolide-class antibiotic, has been reported as the agent most frequently associated with antibiomania.[2] Although the exact mechanism by which clarithromycin triggers mania is not known, there are some mechanisms suggested to explain this relationship. One of the mechanisms proposed to explain the relationship between clarithromycin and antibiomania is that clarithromycin causes negative allosteric modulation on GABA-A receptors. This results in a decrease in the GABA-mediated response.[13] Another proposed mechanism is that clarithromycin has an antagonistic effect on GABA-A receptors. The antagonistic effect reduces GABA-A receptor inhibition and reduces the entry of chloride ions into the neuron. This can lead to neuronal hyperactivity, increased dopamine and glutamate, and the emergence of manic symptoms.[14]

Although less frequent than clarithromycin, cases of antibiotic mania associated with the use of amoxicillin-clavulanic acid combination have also been reported in the literature. These case reports suggest that amoxicillin-clavulanate, like clarithromycin, may trigger mania through GABA antagonism.[8]

Beyond its effects on GABAergic neurotransmission, several alternative mechanisms have been proposed to explain the occurrence of antibiomania. These include elevated levels of cortisol, prostaglandin E1, pro-inflammatory cytokines, and C-reactive protein. Additionally, disruptions in glutamatergic signaling, mitochondrial dysfunction caused by antibiotic exposure, and alterations in gut microbiota composition have also been considered as potential contributing factors.[2]

Additional investigations are required to better understand the underlying mechanisms involved.

It has been suggested that repeated exposure to triggering factors might progressively lower the threshold for mood episodes, as conceptualized by the kindling hypothesis. This model further emphasizes the importance of psychiatric monitoring in such cases.[15,16]

Secondary etiologies should be considered when evaluating acute mood disturbances in pediatric populations. A thorough psychiatric history is essential for the identification of antibiotic-induced mania, allowing clinicians to avoid unnecessary psychopharmacological interventions.

Ethics

Informed Consent: Verbal assent was obtained from the child, and written informed consent was obtained from his parents.

Footnotes

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