

Artificial Intelligence and Children's Mental Health: Opportunities, Risks, and Developmental Implications

Vefa ABDURRAHİMOVA¹

¹(Istanbul University-Cerrahpaşa, Institute of Forensic Medicine and Forensic Sciences, Department of Social Sciences, Istanbul, Turkey)

ABSTRACT : *This study provides a narrative review of the impact of artificial intelligence (AI) on children's mental health from a developmental and contextual perspective. As AI technologies become increasingly integrated into children's daily lives, their influence on cognitive, emotional, and social processes has gained growing attention. The literature suggests that AI is not a direct determinant of mental health outcomes; rather, its effects depend on factors such as developmental stage, patterns of use, and family and environmental context. While AI-supported systems in healthcare and education offer benefits such as early identification, personalized interventions, and adaptive learning, excessive or unregulated digital exposure may be associated with difficulties in attention, emotional regulation, identity development, and social interaction. Overall, the findings highlight that the impact of AI on children's mental health is complex and context-dependent. A balanced and developmentally informed approach is essential to maximize potential benefits while minimizing risks.*

KEYWORDS- *Artificial Intelligence, Child Mental Health, Digital Exposure, Child Psychopathology, Emotional Development, Technology Use in Children*

I. INTRODUCTION

Technological advancements, particularly in the field of artificial intelligence (AI), have led to significant transformations across multiple domains of human life. Digital technologies are no longer limited to facilitating communication and access to information; rather, they have become integrated systems that shape daily routines, decision-making processes, and patterns of interaction. With the increasing incorporation of AI into these systems, many processes have become automated, raising important questions regarding their potential impact on cognitive and behavioral functioning [1, 2].

Within this broader transformation, the implications of AI for children represent a particularly critical area of inquiry. Childhood is a developmental period characterized by rapid changes in cognitive, emotional, and social capacities. From a developmental perspective, learning processes are traditionally supported through direct interaction with the physical and social environment. However, the early and intensive exposure to digital technologies may alter these developmental pathways by reshaping how children engage with information, interact with others, and regulate their behavior [1].

Existing research suggests that digitally mediated environments, characterized by continuous stimulation and high information flow, may influence attention processes, learning motivation, and emotional regulation [2]. In addition, increased time spent in online environments has been associated with reduced face-to-face social interaction and greater exposure to potential risks such as online exploitation (grooming), cyber identity formation, and other psychosocial challenges [3, 4]. However, these effects should not be interpreted as uniformly negative, as the literature emphasizes the importance of contextual and individual factors.

Indeed, a growing body of research highlights the potential benefits of AI-supported systems, particularly in the fields of education and healthcare. In educational contexts, adaptive learning technologies can provide personalized learning experiences, thereby supporting individual differences and enhancing academic engagement [5]. Similarly, in healthcare settings, AI applications may contribute to early identification and intervention processes, improving access to mental health services.

Given these contrasting findings, the relationship between artificial intelligence and children's mental health cannot be adequately explained through a unidimensional perspective. Instead, a multidimensional framework that integrates developmental, clinical, and contextual factors is required. In this context, the present study aims to examine the effects of artificial intelligence on children's mental health through a comprehensive review of the literature. The study further explores these effects across key domains, including healthcare, education, and digital environments, while also considering ethical considerations and children's rights within a holistic framework.

II. ARTIFICIAL INTELLIGENCE AS A DEVELOPMENTAL CONTEXT

Artificial intelligence (AI) refers to computational systems designed to perform tasks that typically require human cognitive abilities, such as learning, reasoning, problem-solving, and decision-making. Over the past decades, AI has evolved from rule-based systems into more complex models, including machine learning and deep learning approaches, which enable systems to process large amounts of data and adapt based on experience [1].

In contemporary contexts, AI is increasingly embedded in digital platforms and everyday technologies, shaping how individuals access information, communicate, and interact with their environment. Algorithm-driven systems, particularly those used in social media and digital applications, operate by analyzing user behavior and delivering personalized content. These mechanisms are designed to increase user engagement and can influence attention, preferences, and behavioral patterns through reinforcement-based processes.

From a psychological perspective, such systems may affect cognitive processes by reducing the need for active problem-solving and independent decision-making. While automation can enhance efficiency and convenience, it may also contribute to changes in attention regulation, information processing, and behavioral engagement. However, these effects should be interpreted cautiously, as the literature emphasizes the role of contextual and individual differences.

Importantly, the implications of AI cannot be understood independently of the environments in which it operates. Digital ecosystems that incorporate AI technologies create interactive and continuously stimulating environments, which may have both adaptive and maladaptive effects. In particular, prolonged exposure to such environments has been associated with changes in attention patterns, habit formation, and self-regulation processes [2].

Given these characteristics, AI should be conceptualized not only as a technological tool but also as an environmental factor that interacts with developmental processes. This perspective is especially relevant in the context of childhood, where cognitive, emotional, and social systems are still developing. Therefore, understanding the role of artificial intelligence requires an integrated framework that considers both technological functions and their potential psychological implications.

III. ARTIFICIAL INTELLIGENCE IN HEALTHCARE

Artificial intelligence (AI) has become increasingly integrated into healthcare systems, particularly with the acceleration of technological advancements in the modern era. Although the healthcare sector adopted AI applications later than fields such as manufacturing and production, it has rapidly adapted and incorporated these technologies into various processes. Today, AI-supported systems are utilized in multiple areas, including virtual health services, patient self-monitoring, diagnosis, and treatment planning. The automation of hospital appointment systems, electronic medical records, and clinical reporting tools reflects the growing role of AI in healthcare infrastructure. In Türkiye, applications such as e-Nabız, the Central Physician Appointment System (MHRS), decision support systems, and Medula exemplify the digital transformation of healthcare services [6].

In addition, advanced AI technologies such as IBM Watson for Health and Google DeepMind have been employed in disease diagnosis and clinical decision-making processes [6]. These developments have improved the efficiency, accuracy, and accessibility of healthcare services. However, the increasing reliance on digital systems may contribute to the perception among some individuals that the human dimension of care is diminishing.

Artificial intelligence applications have increasingly undertaken tasks traditionally performed by physicians, such as diagnosis, monitoring, and decision support. Nevertheless, existing literature emphasizes that AI is primarily perceived as a supportive tool rather than a replacement for physicians, given the indispensable role of human interaction, empathy, and clinical judgment in medical practice [7, 8].

From a developmental perspective, the transformation of healthcare processes through AI may have multidimensional implications for children's healthcare experiences. In this context, the increasing use of technology in healthcare delivery may reshape children's experiences and interaction patterns within clinical settings. In particular, in situations where opportunities for face-to-face communication and emotional interaction are limited, children's ability to express themselves and feel understood may be affected. However, this transformation should not be considered unidirectional. While AI-supported systems may facilitate access to healthcare and support early diagnosis and intervention processes, they may also lead to a reduction in individual interaction if not appropriately structured. Therefore, especially in the case of children, it is crucial to maintain a balanced integration of technological opportunities and human-centered approaches in healthcare. Such an approach may contribute to addressing both the physical and emotional needs of children in a holistic manner.

In addition to diagnostic and decision-support applications, computer-based interventions have also gained increasing importance in the field of mental health. Among these, neurofeedback interventions are widely used in both children and adults for the assessment and support of attention and self-regulation processes. Neurofeedback involves monitoring brain wave activity and providing real-time visual and auditory feedback, enabling individuals to gradually learn how to regulate their own neural functioning.

Previous research suggests that neurofeedback-based interventions may contribute to improvements in attention, emotional regulation, and behavioral functioning [9, 10]. However, despite these potential benefits, the application of such technology-based approaches in children requires careful consideration of developmental characteristics. The effectiveness of these interventions depends not only on technological precision but also on the integration of human-centered clinical support.

IV. ARTIFICIAL INTELLIGENCE AND PSYCHOPATHOLOGICAL PROCESSES

In contemporary society, individuals increasingly live within digitally mediated environments in which behaviors and interactions can be structured and influenced at both individual and collective levels. While these developments offer important opportunities, they have also raised concerns regarding their potential psychological

implications. The rapid development of digital technologies and artificial intelligence (AI) has significantly transformed how individuals interact, communicate, and construct their sense of self. In contemporary contexts, algorithm-driven digital platforms are designed to increase user engagement through personalized content delivery. By analyzing user behavior and preferences, these systems encourage prolonged interaction with online environments and may influence attention, decision-making processes, and behavioral patterns through reinforcement-based mechanisms.

Although such systems can enhance user experience, concerns have been raised regarding their potential impact on cognitive and emotional processes. In particular, excessive exposure to algorithmically curated content may be associated with changes in attention regulation, habit formation, and self-perception [2]. However, these effects should be interpreted cautiously and within the context of individual differences and patterns of use.

In digital environments, individuals may construct alternative identity representations, often referred to as “cyber identities” [4]. While such identities can support self-expression and exploration, discrepancies between online and offline self-representations may, in some cases, be associated with challenges in identity development, emotional regulation, and social interaction [11]. In addition, intensive internet use may affect the coherence between online and offline identities, particularly when usage patterns become excessive.

Similar to alter personality states observed in dissociative processes—such as “the child,” “the enemy,” or “the leader”—individuals in digital environments may construct flexible or multiple identity representations [12, 11]. However, the use of such identities is not inherently indicative of psychopathology. Rather, in certain contexts—particularly among individuals with pre-existing psychological vulnerabilities—intensive digital engagement may be associated with dissociative-like experiences or difficulties in self-concept integration [12].

From a developmental perspective, these processes are especially important for children and adolescents, whose cognitive and emotional systems are still developing. Digital environments may shape how young individuals construct and present their sense of self. While online platforms can support exploration and self-expression, excessive or unregulated use may lead to discrepancies between online and offline identities. Such discrepancies may, in some cases, be associated with challenges in identity development, emotional regulation, and social interaction. When digital engagement replaces or limits real-life experiences, children and adolescents may encounter difficulties in forming stable interpersonal relationships and developing a coherent sense of self [13]. Therefore, it is important to evaluate digital environments within a balanced developmental framework, particularly in relation to child mental health.

V. CHILD MENTAL HEALTH AND FACTORS AFFECTING CHILD MENTAL HEALTH

Childhood, typically defined as the period between ages 0 and 18, represents a critical stage in human development in which cognitive, emotional, and social foundations are established [14]. During this period, children’s mental health is shaped not only by individual characteristics but also by environmental, familial, and social factors.

Mental health in children can be described as the ability to function harmoniously with oneself and the surrounding environment, including the capacity for emotional regulation, social interaction, and adaptive learning. However, the interpretation of mental health must be considered in relation to developmental stages, as behaviors that are considered normative at one age may be viewed as pathological at another [15]. Accordingly, developmental context plays a crucial role in the identification and evaluation of psychological difficulties in children.

A growing body of research suggests that many psychological disorders observed later in life have their roots in childhood and adolescence [16]. Early identification and intervention are therefore essential for promoting long-term psychological well-being. When mental health difficulties are not adequately recognized or addressed during

childhood, individuals may experience persistent emotional and behavioral challenges, which can negatively affect both personal and social functioning.

Numerous studies have identified a range of risk factors associated with child psychopathology. These include adverse family environments, parental substance use, exposure to physical or sexual abuse, socio-economic disadvantage, and social violence [17]. In addition, childhood trauma has been consistently linked to the development of dissociative symptoms and other psychological disorders [18]. Such findings highlight the importance of early environmental conditions in shaping mental health outcomes.

At the same time, the increasing integration of digital technologies into children's daily lives has introduced new dimensions to these risk factors. While access to digital platforms can support learning and social connectivity, it may also expose children to various risks, including cyberbullying, online exploitation, and inappropriate content. For instance, "grooming"—a process in which adults manipulate children in online environments—represents a significant threat to child safety and psychological well-being [3].

Despite the strong emphasis on risk factors in the literature, it is important to recognize that not all children exposed to adverse conditions develop psychopathology. Protective factors such as supportive family relationships, emotional resilience, and access to social support systems can mitigate the negative impact of these risks. In this sense, child mental health should be understood within a multidimensional framework that includes both risk and protective mechanisms.

Furthermore, the effects of digital environments on child mental health are not uniformly negative. While excessive or unregulated use may be associated with psychological difficulties, digital platforms can also provide opportunities for learning, identity exploration, and social support. Therefore, the impact of digital technologies should be evaluated in relation to usage patterns, developmental stage, and contextual factors.

Finally, it is important to acknowledge certain limitations within the existing literature. Many studies rely on cross-sectional designs, which limit the ability to establish causal relationships. In addition, cultural differences, variations in assessment tools, and the rapidly evolving nature of digital environments make it difficult to generalize findings. Future research should therefore adopt longitudinal and culturally sensitive approaches to better understand the complex interactions influencing child mental health.

The rapid integration of artificial intelligence (AI) and digital technologies into everyday life has created both opportunities and challenges for mental health, particularly in the context of child development. The existing literature suggests that AI-supported systems and digital environments have the potential to enhance access to healthcare, support early identification of psychological difficulties, and contribute to individualized intervention processes. At the same time, these developments introduce new psychosocial dynamics that may influence cognitive, emotional, and behavioral functioning.

VI. THE EFFECTS OF ARTIFICIAL INTELLIGENCE ON CHILDREN'S MENTAL HEALTH

Artificial intelligence (AI) has become an increasingly influential component of children's daily environments, shaping their learning processes, social interactions, and access to information. As AI-based tools are progressively integrated into educational and healthcare systems, their implications for children's mental health have attracted growing scholarly attention.

On the one hand, a number of studies emphasize the potential benefits of AI-supported systems. These include facilitating early identification of psychological difficulties, enabling personalized learning experiences, and improving access to mental health support services [19]. For instance, adaptive educational technologies tailored

to individual learning styles may enhance children's self-efficacy, competence, and motivation. Similarly, AI-supported mental health applications may contribute to early intervention by identifying patterns associated with emotional and behavioral difficulties.

On the other hand, a growing body of research highlights potential risks associated with increased exposure to AI-driven and digital environments. These risks include excessive screen time, reduced face-to-face social interaction, overreliance on technological systems, and concerns related to privacy and ethics. In particular, prolonged engagement with digital platforms has been associated with difficulties in attention regulation, emotional processing, and social development [2].

While some studies emphasize the benefits of AI-supported systems in enhancing learning and mental health support, other research highlights potential risks associated with excessive digital exposure. This divergence in findings suggests that the impact of AI on children's mental health should be interpreted within a context-dependent framework.

Importantly, the existing literature suggests that the effects of AI on children's mental health are not uniform. Rather than being inherently beneficial or harmful, these effects appear to depend on multiple interacting factors, including developmental stage, family context, digital literacy, and patterns of use. For example, structured and supervised engagement with AI-based tools may support cognitive and emotional development, whereas excessive or unsupervised use may contribute to maladaptive behavioral patterns or social withdrawal [13].

In addition, individual differences play a critical role in shaping outcomes. Children with strong family support, higher emotional resilience, and access to protective social environments may benefit more from AI-based opportunities, whereas those exposed to psychosocial risk factors may be more vulnerable to negative outcomes. This perspective highlights the importance of evaluating AI within a broader ecological and developmental framework.

Furthermore, several limitations within the current body of research should be acknowledged. Many studies rely on cross-sectional designs, limiting the ability to establish causal relationships. The rapidly evolving nature of AI technologies also complicates the assessment of their long-term psychological effects. Moreover, cultural differences and inequalities in access to digital resources may influence both the use and the impact of AI systems across different populations.

In conclusion, the relationship between artificial intelligence and children's mental health should be conceptualized within a balanced and multidimensional framework. While AI has the potential to support psychological well-being through early detection, personalized interventions, and increased accessibility, its potential risks should not be overlooked. Therefore, careful regulation, parental guidance, and the integration of human-centered approaches remain essential to ensure that AI contributes positively to children's mental health outcomes.

VII. ARTIFICIAL INTELLIGENCE AND CHILDREN'S RIGHTS

The rapid development of artificial intelligence (AI) has introduced important ethical and human rights concerns, particularly in relation to children. The literature highlights those issues such as privacy, data protection, and autonomy have become increasingly central in the context of AI applications [20, 21]. In response, regulatory frameworks such as the General Data Protection Regulation (GDPR) and the Children's Online Privacy Protection Act (COPPA) have established legal safeguards, requiring parental consent for the processing of children's personal data. In Türkiye, although the Law on the Protection of Personal Data No. 6698 does not include specific

provisions exclusively addressing minors, the principle of the “best interests of the child,” as outlined in the United Nations Convention on the Rights of the Child, provides a fundamental legal and ethical framework.

The use of AI technologies in educational settings further illustrates these concerns. For example, facial recognition systems have been implemented in some schools to monitor attendance and student behavior. While such systems may contribute to administrative efficiency and safety, they also raise significant concerns regarding continuous surveillance, privacy, and children’s autonomy [22].

From a developmental perspective, exposure to such monitoring systems may influence children’s understanding of personal boundaries and expectations of privacy. Therefore, the literature suggests that AI applications involving children should be carefully evaluated within a rights-based and ethical framework that prioritizes transparency, accountability, fairness, and the protection of personal data.

VIII. CONCLUSION

This review examined the impact of artificial intelligence (AI) on children’s mental health by integrating evidence from developmental psychology, digital environments, healthcare applications, and children’s rights frameworks. The literature consistently indicates that child mental health is shaped by a complex interaction of individual, familial, environmental, and technological factors. While traditional determinants such as trauma, family functioning, and socio-economic conditions remain central, digitalization and AI-driven systems have emerged as influential contextual variables in contemporary childhood. Across the reviewed domains, AI appears not as a direct determinant of psychological outcomes but as a context-dependent factor whose effects vary according to patterns of use, developmental stage, and the presence of protective or risk factors. In healthcare, AI-supported systems have demonstrated potential in early identification, monitoring, and personalized intervention processes. In educational contexts, adaptive technologies may enhance learning experiences and support individual differences. However, in digital environments, prolonged and unregulated exposure has been associated with challenges in attention, emotional regulation, identity development, and social interaction.

Importantly, the literature does not support a uniformly negative or positive interpretation of AI. Rather, findings highlight a dual structure in which benefits and risks coexist. This underscores the necessity of adopting a balanced and multidimensional framework when evaluating AI in relation to child mental health. The integration of developmental, clinical, and ecological perspectives is essential for understanding these complex dynamics.

From a clinical standpoint, the evidence consistently emphasizes that AI cannot replace core human elements such as empathy, interpersonal interaction, and clinical judgment. Particularly in child-focused interventions, relational processes remain central to both assessment and treatment. Therefore, AI should be conceptualized as a supportive tool that enhances, rather than substitutes, human-centered care.

From an ethical and rights-based perspective, the increasing use of AI in children’s lives raises critical concerns related to privacy, data protection, surveillance, and autonomy. The literature highlights the importance of grounding AI applications in fundamental principles such as the best interests of the child, transparency, accountability, and fairness. Ensuring that AI systems do not reinforce inequalities or expose children to harm is a key responsibility for developers and policymakers.

Furthermore, the reviewed studies reveal several limitations, including the predominance of cross-sectional designs, the lack of longitudinal evidence, and variability across cultural contexts. The rapid evolution of AI technologies also makes it difficult to assess long-term psychological effects. Future research should therefore adopt interdisciplinary, longitudinal, and culturally sensitive approaches to better understand the dynamic relationship between artificial intelligence and child mental health.

In conclusion, artificial intelligence holds significant potential to support children's development and psychological well-being when implemented within a balanced, ethical, and developmentally informed framework. The critical challenge lies not in limiting technological advancement, but in ensuring that its integration aligns with human values, clinical knowledge, and the protection of children's rights. This review contributes to the literature by integrating developmental, clinical, and technological perspectives into a unified framework for understanding the impact of artificial intelligence on child mental health.

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