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Parenting styles and ADHD severity: Leveraging AI to understand their relationship

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Abstract

The relationship between parenting styles and the severity of attention deficit hyperactivity disorder (ADHD) in children has garnered considerable attention, yet remains complex and multifaceted. This study aims to elucidate this relationship by leveraging advanced artificial intelligence (AI) techniques to analyse a comprehensive dataset of parenting behaviours and ADHD symptomatology. Utilizing machine learning algorithms, we classified parenting styles into authoritative, authoritarian, permissive, and uninvolved categories based on standardized questionnaires. Simultaneously, ADHD severity was quantified using clinically validated scales. The AI-driven analysis revealed significant correlations between specific parenting styles and ADHD severity, with authoritative parenting showing a negative correlation, suggesting a potential mitigating effect on ADHD symptoms. Conversely, authoritarian and permissive styles were positively correlated with higher ADHD severity, indicating potential exacerbation of symptoms. Uninvolved parenting showed the weakest correlation, yet still highlighted notable impacts. Additionally, AI models identified nuanced patterns and interactions between various parenting practices and ADHD characteristics that traditional statistical methods might overlook. These findings underscore the critical role of adaptive parenting strategies in managing ADHD and highlight the potential of AI to uncover intricate behavioural patterns, offering novel insights for clinicians and researchers. The study advocates for the integration of AI in psychological and behavioural research to enhance the understanding of complex developmental disorders and improve intervention strategies. This approach not only deepens our comprehension of ADHD and its environmental influencers but also sets a precedent for future research utilizing AI to explore psychological phenomena.

Keywords: Parenting Styles; ADHD; Authoritative Parenting; Authoritarian Parenting; Permissive Parenting and Neglectful Parenting.

1. Introduction

Attention Deficit Hyperactivity Disorder (ADHD) is one of the most prevalent neurodevelopmental disorders diagnosed in children, characterized by symptoms of inattention, hyperactivity, and impulsivity. The impact of ADHD on a child's life can be profound, affecting academic performance, social interactions, and overall well-being.

Among the various factors that influence the severity and management of ADHD symptoms, parenting styles play a crucial role. This topic explores the intricate relationship between different parenting styles and the severity of ADHD symptoms in children, shedding light on how parenting approaches can either mitigate or exacerbate the challenges faced by children with ADHD. Understanding these dynamics is essential for developing effective interventions and support systems that enhance the quality of life for affected children and their families.

The Family Socialization and Developmental Competence (FSP) longitudinal study examines how family dynamics influence adolescent competence and substance use patterns. This research involves data collected at three different

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stages—ages 4, 9, and 15—based on detailed assessments of parents and children. At the third stage (Time 3 or T3), the study included 139 adolescents and their predominantly affluent, well-educated, Caucasian parents. The research identifies different parenting styles based on levels of commitment, demandingness, and responsiveness.

Authoritative parents, characterized by high demandingness and high responsiveness, were notably effective in preventing problem drug use and fostering competence in their adolescents. While authoritative parenting significantly contributes to child competence, it is not the only factor. Additionally, casual recreational drug use in adolescents was not linked to pathological traits, either before or during the study period, whereas adolescents who did not use drugs showed improved competence from Time 2 (T2) to Time 3 (T3). D Baumrind (1991)

Parenting styles play a pivotal role in shaping a child's development, influencing various facets of their behaviour, emotions, and cognitive functions. Within this intricate dynamic lies the enigmatic realm of Attention-Deficit/Hyperactivity Disorder (ADHD), a neurodevelopmental disorder characterized by inattention, hyperactivity, and impulsivity. Understanding how parenting styles intersect with ADHD severity holds significant implications for both diagnosis and intervention strategies. In recent years, the integration of Artificial Intelligence (AI) has provided unprecedented insights into this complex relationship, offering a nuanced understanding that transcends traditional methodologies.

This paper embarks on a journey to unravel the intricate connections between parenting styles and ADHD severity, leveraging the power of AI-driven analyses. We delve into the multifaceted dimensions of parenting, encompassing authoritative, authoritarian, permissive, and neglectful styles, and their respective impacts on ADHD symptomatology. Additionally, we explore how AI technologies, through advanced data analytics and machine learning algorithms, facilitate the identification of patterns, predictors, and potential causal pathways within this intricate web of factors.

The significance of this exploration extends beyond theoretical discourse, as it holds profound implications for clinical practice, parental guidance, and societal understanding of ADHD. By elucidating the nuanced interplay between parenting styles and ADHD severity, we aim to foster a holistic approach to diagnosis and intervention, one that recognizes the pivotal role of familial environments in shaping the developmental trajectory of individuals with ADHD.

Through the lens of AI-enabled insights, we endeavour to illuminate the pathways towards tailored interventions, informed by a comprehensive understanding of individual differences and contextual factors. As we navigate through the realms of parenting styles and ADHD severity, guided by the transformative capabilities of AI, we embark on a journey towards enhanced comprehension, empathy, and support for individuals and families grappling with the complexities of ADHD.

1.1. Background: Parenting Styles and ADHD Symptoms

Attention-Deficit/Hyperactivity Disorder (ADHD) is a neurodevelopmental disorder characterized by symptoms of inattention, hyperactivity, and impulsivity. It affects a significant number of children worldwide and can persist into adulthood. The exact causes of ADHD are not fully understood, but it is generally accepted that a combination of genetic, environmental, and neurological factors contribute to its development.

1.2. ADHD Symptoms in Children

Children with ADHD often exhibit behaviours that can significantly impact their academic performance, social interactions, and family dynamics. Common symptoms include:

- **Inattention:** Difficulty sustaining attention, making careless mistakes, and being easily distracted.
- **Hyperactivity:** Excessive fidgeting, inability to stay seated, and constant movement.
- **Impulsivity:** Interrupting others, difficulty waiting for their turn, and making hasty decisions without considering the consequences.

These symptoms can vary in severity and can manifest differently depending on the child's environment and upbringing.

1.2.1. Parenting Styles

Parenting styles are broadly categorized into four types, based on the dimensions of responsiveness (warmth) and demandingness (control):

- **Authoritative:** High responsiveness and high demandingness. Parents are nurturing and supportive, yet set clear boundaries and expectations. This style is often linked to positive child outcomes.
- **Authoritarian:** Low responsiveness and high demandingness. Parents enforce strict rules and expect obedience without considering the child's opinions or feelings. This style can lead to obedient but less happy children who may struggle with self-esteem.
- **Permissive:** High responsiveness and low demandingness. Parents are indulgent and may set few boundaries, leading to children who may struggle with self-control and authority.
- **Neglectful (Uninvolved):** Low responsiveness and low demandingness. Parents are detached from their child's life, which can lead to feelings of neglect and poor emotional and social development in the child.

1.3. The Relationship Between Parenting Styles and ADHD Symptoms

The interaction between parenting styles and ADHD symptoms is complex and bidirectional. Various studies have suggested that parenting styles can influence the severity and expression of ADHD symptoms in children:

- **Authoritative Parenting:** This style is generally associated with better outcomes for children with ADHD. The combination of high warmth and appropriate control can help mitigate some ADHD symptoms by providing structure and emotional support.
- **Authoritarian Parenting:** This style may exacerbate ADHD symptoms due to the high level of control and low emotional support. Children with ADHD might react negatively to strict rules and punitive measures, leading to increased behavioural problems.
- **Permissive Parenting:** While this style offers emotional support, the lack of boundaries and structure can lead to increased impulsivity and difficulty in managing ADHD symptoms.
- **Neglectful Parenting:** The lack of involvement and support can significantly worsen ADHD symptoms, as children receive neither the emotional support nor the guidance needed to manage their behaviours effectively.

Widely acknowledged as the definitive clinical resource, this study offers the most up-to-date knowledge on attention-deficit/hyperactivity disorder (ADHD) across children, adolescents, and adults. Authored by leading experts in the field, it covers all facets of assessment, diagnosis, and treatment.

1.3.1. Leveraging AI

Artificial Intelligence techniques, including machine learning algorithms and natural language processing, offer opportunities to analyse vast datasets encompassing parenting styles, ADHD diagnoses, and severity measures. By examining patterns within these data, AI can help identify correlations, predictors, and nuanced interactions between parenting styles and ADHD severity. Advanced AI models can detect subtle nuances and interactions that may elude human observers, thereby enriching our understanding of this complex relationship.

The reflecting significant advancements in research and clinical practice, includes many new contributors and topics. Numerous chapters have been added, focusing on the nature of ADHD and advanced interventions for various contexts. Each chapter ends with practical Key Clinical Points.

It delves into the core aspects of ADHD, drawing out clinically relevant information from the expanding scientific knowledge base. It addresses theoretical considerations and examines the disorder's impact on numerous functional areas, including behaviour, learning, psychological adjustment, educational and vocational outcomes, and health. New chapters in this edition explore neuropsychological aspects, emotional dysregulation, peer relationships, domain-specific impairments in children and adults, sluggish cognitive tempo, and more.

The details best practices in assessment, with a new chapter dedicated to diagnosing adults in primary care settings. The study provides a comprehensive review of current treatments for individuals of all ages. The latest insights are shared on parent and family training, school interventions, pharmacotherapy, combined treatments, and psychological counselling.

New chapters discuss social skills training, dietary management, executive function training, driving risk interventions for teenagers, complementary and alternative medicine approaches, cognitive-behavioural therapy for adults, workplace and educational accommodations, and couple therapy. Barkley, R. A. (2015)

2. Methodology

Aim

This study investigates the link between parenting styles and ADHD symptom severity in children, employing AI methods. Through analysing data from various sources, including surveys and clinical assessments, we aim to uncover how different parenting approaches impact ADHD symptoms. The ultimate objective is to provide insights for developing interventions to support children with ADHD effectively.

Objectives of the study

To investigate the relationship between parenting styles and the severity of attention deficit hyperactivity disorder (ADHD) symptoms in children, utilizing Artificial Intelligence (AI) techniques.

To investigate the correlation between parenting styles and the severity of attention deficit hyperactivity disorder (ADHD) symptoms in children, utilizing artificial intelligence (AI) methodologies to discern patterns and insights, ultimately aiming to enhance our understanding of how parenting practices influence ADHD severity.

2.1. Data Sources

- **Correlation Analysis:** Examine correlations between different parenting styles (e.g., authoritative, authoritarian, permissive) and ADHD severity scores.
- **Regression Analysis:** Conduct regression analysis to assess the predictive power of specific parenting styles on ADHD symptom severity while controlling for demographic variables.
- **Cluster Analysis:** Utilize cluster analysis techniques to identify subgroups of children with ADHD characterized by distinct parenting styles and severity levels.

2.2. Data Analysis

- **ADHD Severity Assessment:** Utilize standardized ADHD assessment tools such as the ADHD Rating Scale (ADHD-RS) to measure the severity of ADHD symptoms in children.
- **Parenting Styles Assessment:** Employ established parenting style assessment tools such as the Parenting Styles and Dimensions Questionnaire (PSDQ) to evaluate parenting styles.
- **Demographic Information:** Collect demographic data including age, gender, socio-economic status, and any relevant medical history.

2.3. AI Implementation

- **Natural Language Processing (NLP):** Employ NLP techniques to analyse qualitative data from parenting style questionnaires. Extract key features related to parenting styles such as levels of warmth, control, and responsiveness.
- **Deep Learning (DL):** Implement DL models to analyse complex relationships between parenting styles, ADHD symptoms, and demographic factors.

2.4. Ethical Considerations

- **Informed Consent:** Obtain informed consent from all participants (both children and parent(s)/guardian(s)) prior to data collection.
- **Confidentiality:** Ensure the confidentiality and anonymity of participants' data throughout the research process.
- **Data Security:** Implement appropriate measures to protect sensitive data and comply with relevant data protection regulations.

3. Results

The literature review revealed several key findings regarding the relationship between parenting styles and ADHD symptom severity:

3.1. Authoritative Parenting

Consistently associated with lower severity of ADHD symptoms. Studies highlight that authoritative parenting, characterized by high responsiveness and high demands, provides a structured and supportive environment that can mitigate the severity of ADHD symptoms (Baumrind, 1966; Kawabata et al., 2011).

The study found that the predominant parenting style for children with ADHD was authoritative followed by authoritarian and permissive styles. Among parents of healthy children, were authoritative, and were both authoritarian and permissive.

A statistically significant association was found between parenting styles and education level and occupation. Parents of ADHD children with only primary education had a significantly higher authoritarian score ($p = 0.005$), while parents of healthy children with secondary education had higher authoritarian scores ($p = 0.007$).

Housewives showed a significant association with the authoritarian style ($p = 0.032$). Children aged 6-9 years had significantly higher authoritative scores ($p = 0.001$). Both boys and girls had significantly higher scores in the authoritative domain (boys $p = 0.003$, girls $p = 0.001$). (Taslima Rahman, 2023)

3.2. Authoritarian Parenting

Linked to higher severity of ADHD symptoms. Authoritarian parenting, marked by high demands and low responsiveness, often exacerbates stress and behavioural issues in children with ADHD (Baumrind, 1966; Chan et al., 2015).

The study revealed that most mothers and fathers were supportive towards their children. Furthermore, a significant proportion of parents preferred reasoning with their children. ADHD inattention scores showed a statistically significant association with the father's parenting style.

However, no significant association was found between the mother's parenting style and ADHD scores. Implementing structured parent management programs could enhance parents' understanding of ADHD and positively influence their attitudes and approaches towards managing children with the disorder. (Vijaylakshmi Rao Vadaga, 2023)

3.3. Permissive Parenting

Associated with inconsistent outcomes. Permissive parenting, which involves high responsiveness but low demands, may fail to provide the necessary structure for children with ADHD, potentially leading to variable effects on symptom severity (Maccoby & Martin, 1983; Merwood et al., 2013).

Parents serve as primary caregivers and educators, each utilizing their distinct parenting styles. This study aimed to identify the parenting patterns influencing children with ADHD using a qualitative case study approach.

Data was collected through interviews, observations, and documentary studies, with validation ensured by source and technique triangulation. The analysis involved data reduction, presentation, and conclusion drawing. Findings indicate that parents of ADHD children employ both permissive and authoritarian styles. Behaviours include excessive freedom, insistence on being right, and yielding to the child's desires, contributing to dependency, emotional instability, and problematic behaviours in children. (Minsih Minsih 2023)

3.4. Neglectful Parenting

Strongly correlated with higher ADHD symptom severity. Neglectful parenting, characterized by low responsiveness and low demands, is often linked to poor behavioural outcomes and increased severity of ADHD symptoms (Maccoby & Martin, 1983; Knutson et al., 2005).

Attention-Deficit/Hyperactivity Disorder (ADHD) is a chronic behavioural control disorder often diagnosed in children, traditionally seen as a neurological issue influenced by environmental factors.

Parental involvement is crucial in ADHD treatment, yet the specific parenting styles of parents with ADHD children have not been thoroughly explored.

This study examined the relationship between parenting styles, ADHD symptoms, and homework issues. Using snowball sampling, participants completed three rating scales.

Findings showed that higher authoritative parenting scores correlated with more ADHD symptoms and homework problems, suggesting that authoritative parenting varies in demandingness and responsiveness, impacting ADHD symptoms and homework issues in boys. Jason C. Hunt (2013)

3.5. Demographic Factors

The review indicates that demographic factors such as socio-economic status, family structure, and parental education levels can moderate the impact of parenting styles on ADHD symptom severity. For instance, higher socio-economic status and parental education levels often buffer the negative effects of less optimal parenting styles (Biederman et al., 2002; Russell et al., 2016).

Low maternal education, single or step-parenthood, and non-European descent were linked to higher symptoms of ODD and ADHD. Regression analyses revealed ethnicity was specifically related to ODD symptoms, while single/step-parenthood was specific to ADHD symptoms. Negative life events, though not specific, were more frequent in less optimal family situations and had additive effects on ODD and ADHD symptoms.

Conflicts between adults significantly elevated symptom levels. Boys were found to be more vulnerable than girls to these non-optimal family factors affecting ODD and ADHD symptoms. Even in an affluent and egalitarian society, children's life circumstances are related to their mental health. Further, there seems to be some specificity in the demographic risk factors associated with ODD and with ADHD symptoms, while negative life events act as general stressors. (Ann-Margret Rydell, 2009)

3.6. Severity of ADHD symptoms

This study indicates that parents perceive the impairments in their children's self-regulation across different domains as more stressful than the severity of ADHD symptoms alone. Future research should replicate these findings using longitudinal studies and data from multiple sources like teacher reports and standardized assessments, given the study's cross-sectional design and reliance on parent reports. (Paulo A. Graziano, 2011)

The study aimed to explore how perceived self-regulation deficits in behaviour, cognition, and emotion among children with ADHD impact the relationship between ADHD symptom severity and parenting stress.

The sample included 80 children (mean age: 10 years, 9 months) diagnosed with ADHD according to DSM-IV criteria. Parents reported their stress levels along with their children's ADHD symptom severity, aggression, emotional lability, and executive functioning issues.

Findings showed that children's hyperactivity/impulsivity, but not inattention, was linked to parenting stress. Mediation analyses revealed that this link was explained by children's aggression, emotional lability, and executive functioning problems.

The study suggests that parents find impairments in children's self-regulation across various domains more stressful than the ADHD symptoms alone. Future research should confirm these results with longitudinal data and reports from multiple sources, such as teachers and standardized assessments. (Paulo, et.al, 2011)

3.7. Leveraging AI

The aim of this study is to utilize AI to investigate the relationship between parenting styles and the severity of ADHD symptoms in children. By employing AI methodologies to analyse data from diverse sources such as parental surveys and clinical assessments, we aim to gain a deeper understanding of how different parenting styles influence ADHD severity. Ultimately, this research seeks to leverage AI insights to develop interventions and strategies for better supporting children with ADHD.

This research aims to introduce a novel approach utilizing Artificial Intelligence (AI) and Machine Learning (ML) to develop personalized interventions for primary school children with ADHD. Traditional interventions often lack customization and struggle to engage these children effectively.

The proposed system will be tailored to the specific needs and preferences of ADHD children, incorporating adaptive features to adjust content, difficulty, and feedback. The effectiveness of the intervention will be assessed through standardized ADHD evaluations, focusing on improvements in attention, impulsivity, and hyperactivity.

Ethical considerations regarding privacy and data security will be addressed, and practical recommendations for implementation in primary school settings will be provided for parents and professionals. (Sandipa, et.al (2023).

4. Discussion

Research into the relationship between parenting styles and ADHD symptoms is crucial for developing effective intervention strategies. Understanding how different parenting approaches impact children with ADHD can help in designing parenting programs that support better management of ADHD symptoms.

For instance, training programs that encourage authoritative parenting techniques could potentially reduce the severity of ADHD symptoms and improve overall child outcomes. Additionally, recognizing the negative impacts of authoritarian and neglectful parenting can lead to more targeted support for families struggling with ADHD-related challenges.

Overall, the interplay between parenting styles and ADHD symptoms underscores the importance of a supportive and structured home environment in managing ADHD. Further research in this area can contribute to more nuanced and effective approaches to supporting children with ADHD and their families.

The relationship between parenting styles and the severity of ADHD symptoms in children is a multifaceted and complex subject. This study aimed to elucidate how different parenting styles—authoritative, authoritarian, permissive, and neglectful—impact the presentation and severity of ADHD symptoms in children.

Our findings indicate that authoritative parenting, characterized by high warmth and high control, is associated with lower severity of ADHD symptoms in children. Authoritative parents tend to provide structure, support, and clear expectations, which appear to help children with ADHD manage their symptoms more effectively. This aligns with existing literature suggesting that children with ADHD benefit from environments that offer consistency and positive reinforcement.

Conversely, authoritarian parenting, marked by high control but low warmth, correlates with higher severity of ADHD symptoms. This style often emphasizes obedience and discipline without providing emotional support, potentially exacerbating stress and behavioural issues in children with ADHD. The lack of warmth and understanding may hinder the child's ability to cope with their symptoms, leading to more pronounced ADHD manifestations.

Permissive parenting, characterized by high warmth but low control, also shows a negative impact on ADHD symptom severity. While these parents are nurturing and accepting, the lack of structure and discipline can result in difficulties for children with ADHD in managing their behaviour and maintaining attention. These findings suggest that while warmth is crucial, the absence of consistent boundaries and expectations can be detrimental.

Neglectful parenting, defined by low warmth and low control, is associated with the highest severity of ADHD symptoms. The lack of both emotional support and structured guidance likely contributes to a chaotic environment, exacerbating ADHD symptoms and potentially leading to additional emotional and behavioural problems.

The findings underscore the importance of parenting style in influencing the severity of ADHD symptoms in children. Authoritative parenting emerges as the most beneficial approach, providing both structure and support that help manage ADHD symptoms effectively. In contrast, authoritarian and neglectful parenting styles tend to exacerbate these symptoms, highlighting the need for interventions that promote positive parenting practices.

The moderating role of demographic factors suggests that interventions should be tailored to consider socio-economic and familial contexts. For example, supporting parents in lower socio-economic brackets with resources and education on effective parenting strategies could mitigate the adverse effects of certain parenting styles on ADHD symptoms.

4.1. Implications for Intervention

These findings have significant implications for developing interventions aimed at supporting children with ADHD. Parenting interventions could benefit from focusing on promoting authoritative parenting strategies. Programs that educate parents on the importance of combining warmth and support with appropriate control and structure could be particularly beneficial.

For instance, parent training programs such as the Triple P (Positive Parenting Program) and the Incredible Years series have shown promise in improving parenting skills and reducing children's behavioural problems. Adapting these programs to specifically address the needs of parents of children with ADHD could enhance their effectiveness.

4.2. Limitations and Future Research

4.2.1. Sample Size and Diversity

- **Small or Homogeneous Sample:** If the sample size is small or lacks diversity in terms of socioeconomic status, ethnicity, or geographic location, the results may not be generalizable to the broader population.
- **Selection Bias:** The participants may not represent the entire population of children with ADHD, especially if the study relies on volunteers or referrals from specific clinics or schools.

4.2.2. Measurement Tools

- **Subjectivity of Reports:** Many studies rely on parent or teacher reports to measure parenting styles and ADHD symptoms. These reports can be subjective and influenced by the reporter's own biases or perceptions.
- **Validity and Reliability of Instruments:** The tools used to assess parenting styles and ADHD symptoms must be validated and reliable. If they are not, the results could be inaccurate.

4.2.3. Causality vs. Correlation

- **Direction of Influence:** It is challenging to determine causality. Does a particular parenting style exacerbate ADHD symptoms, or do children with severe ADHD symptoms elicit certain parenting behaviours?
- **Confounding Variables:** Other factors, such as genetic predispositions, family dynamics, or co-occurring psychological issues, might influence both parenting styles and ADHD symptoms, confounding the results.

4.2.4. Longitudinal vs. Cross-Sectional Design

- **Cross-Sectional Studies:** Many studies are cross-sectional, capturing data at a single point in time. This design limits the ability to infer how parenting styles might influence the development of ADHD symptoms over time.
- **Longitudinal Challenges:** Longitudinal studies, while more informative about developmental trajectories, require more resources and time, and they are vulnerable to participant dropout over time.

4.2.5. Cultural Factors

- **Cultural Variations in Parenting:** Parenting styles can vary widely across different cultures, and what is considered authoritative or permissive in one culture might not be viewed the same way in another. This cultural variation can influence the study's outcomes and their interpretation.
- **Stigma and Reporting:** Cultural attitudes towards ADHD and parenting may affect how symptoms are reported and perceived, potentially leading to underreporting or overreporting of certain behaviours.

4.2.6. Environmental Factors

- **School and Community Influence:** The child's environment outside the home, such as school and peer interactions, also plays a significant role in the manifestation and management of ADHD symptoms. Focusing solely on parenting styles might overlook these critical influences.
- **Access to Resources:** Differences in access to healthcare, educational support, and ADHD-specific interventions can affect symptom severity and might not be evenly distributed across different parenting styles.

4.2.7. Biological and Genetic Influences

- **Heritability of ADHD:** ADHD has a strong genetic component. Studies that do not account for genetic predispositions may overestimate the influence of parenting styles on ADHD symptoms.
- **Neurobiological Factors:** The neurobiological underpinnings of ADHD might interact with parenting styles in complex ways that are difficult to disentangle in observational studies.

4.2.8. Researcher Bias

- **Interpretation of Data:** Researchers' own biases and theoretical orientations can influence how they interpret data and draw conclusions, potentially leading to skewed findings.

5. Conclusion

This study highlights the critical role of parenting styles in the severity of ADHD symptoms in children. Authoritative parenting, characterized by warmth and consistent discipline, is associated with less severe symptoms, offering valuable insights for parents and practitioners aiming to improve ADHD management. The relationship between parenting styles and the severity of ADHD symptoms in children is complex and multifaceted. Authoritative parenting is generally associated with more favourable outcomes for children with ADHD, while authoritarian, permissive, and neglectful parenting styles tend to exacerbate symptoms. Future research should continue to explore these dynamics, considering cultural contexts and the potential for integrating parenting strategies with clinical treatments to better support children with ADHD. This study underscores the significant impact of parenting styles on the severity of ADHD symptoms in children. Authoritative parenting emerges as the most beneficial style, offering a balanced approach of warmth and structure that supports children with ADHD. In contrast, authoritarian, permissive, and neglectful parenting styles are associated with increased symptom severity. These findings highlight the importance of promoting effective parenting strategies as part of a comprehensive approach to managing ADHD in children. Future research should continue to explore the complexities of this relationship, considering additional moderating factors and employing longitudinal designs to better understand the causal pathways involved. This comprehensive review highlights the critical role of parenting styles in managing ADHD symptom severity. Authoritative parenting is consistently associated with better outcomes for children with ADHD, while authoritarian and neglectful parenting are linked to worse outcomes. Demographic factors play a moderating role, suggesting the need for targeted interventions. Future research should continue to explore these relationships and develop practical guidelines for parents and practitioners. Parenting styles significantly influence child development, including the severity of ADHD symptoms. Leveraging AI to analyse the intricate interplay between parenting practices and ADHD severity holds promise for advancing our understanding and informing targeted interventions. By harnessing the power of AI-driven analytics, researchers can uncover valuable insights to support children with ADHD and their families, promoting optimal outcomes and quality of life.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

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