

Caregiver-Reported ADHD in Shanghai, China: Prevalence, Associated Factors, and Implications for Diagnosis

Shuxia Wang^{1,*}, Mengxi Zhang^{2,*}, Lirong Huang^{1,*}, Xinguang Zhang¹, Zheng Xue¹

¹Department of Pediatrics, Shanghai Municipal Hospital of Traditional Chinese Medicine, Shanghai University of Traditional Chinese Medicine, Shanghai, People's Republic of China; ²Department of Health Systems and Implementation Science, Virginia Tech Carilion School of Medicine, Blacksburg, VA, USA

*These authors contributed equally to this work

Correspondence: Zheng Xue; Shuxia Wang, Department of Pediatrics, Shanghai Municipal Hospital of Traditional Chinese Medicine, Shanghai University of Traditional Chinese Medicine, No. 68 Ronglian Road, Jiading District, Shanghai, 201800, People's Republic of China, Tel +86 21 56639828, Email xuezheng@shutcm.edu.cn; grace_wang1983@126.com

Purpose: Attention Deficit Hyperactivity Disorder (ADHD) is one of the most common neurodevelopmental disorders among children and adolescents, while recent distribution of the disease has not been widely studied in China. This study aimed to examine the prevalence of caregiver-reported ADHD in Shanghai, China, and identify associated factors.

Patients and Methods: A cross-sectional survey was conducted in Jiading District, Shanghai, targeting caregivers of children and adolescents attending elementary, middle, and high schools. Data on caregiver-reported ADHD, demographic characteristics, and related health conditions were collected. Descriptive statistics, bivariate and logistic regression analyses were employed to examine the prevalence and factors related to caregiver-reported ADHD.

Results: Overall, 12.64% of caregivers reported that their child had ADHD. Factors associated with caregiver-reported ADHD included male gender, younger age (elementary school), and conditions such as tic disorders, short stature, and anorexia.

Conclusion: The prevalence of caregiver-reported ADHD was found to be nearly twice the estimated national prevalence, potentially reflecting increased awareness and better screening in urban, highly developed areas like Shanghai. However, limitations related to caregiver-reported ADHD should be considered, as symptoms may be misinterpreted due to personal perceptions, cultural biases, and the broad diagnostic criteria of ADHD. Given the potential for over- or under-diagnosis in caregiver-reported ADHD, healthcare providers and educational systems should work to enhance awareness, implement systematic screenings, and provide targeted health education to caregivers and schools to ensure accurate diagnosis and timely intervention.

Keywords: attention deficit hyperactivity disorder, ADHD, caregiver-reported, prevalence, associated factors, diagnosis, Shanghai

Introduction

Attention Deficit Hyperactivity Disorder (ADHD) is one of the most common neurodevelopmental disorders among children and adolescents, characterized by inattention, hyperactivity, disruptive behavior, and impulsivity. Worldwide, 7.6% of children aged 3 to 12 years and 5.6% of teenagers aged 12 to 18 years have ADHD.¹ In China, the overall prevalence of ADHD among children aged 6–16 years is 6.4%.² ADHD is usually diagnosed during childhood and may persist into adulthood.^{3,4}

ADHD significantly affects the social, behavioral, and academic development of children and adolescents. Socially, children with ADHD often struggle due to impulsivity, difficulty interpreting social cues, and an increased likelihood of conflicts, which can lead to peer rejection and bullying.^{5,6} Behaviorally, they may display impulsive actions, challenges with following rules, and oppositional tendencies, raising the risk of conduct-related problems.^{7,8} Academically, issues such as inattention, disorganization, and hyperactivity can impact their ability to focus, complete tasks, and achieve

success in school.^{9–12} These challenges can further negatively impact their self-esteem and long-term health outcomes, highlighting the critical importance of early intervention.¹³

Early intervention can reduce symptom severity and prevent other health-related outcomes for children and adolescents diagnosed with ADHD.¹¹ However, ADHD has been underreported and underdiagnosed in many countries, including China.¹⁴ Therefore, understanding the distribution of ADHD could help to prepare for identification, diagnosis, and management of this disease. The most recent systematic review estimating ADHD prevalence among children and adolescents in China was conducted in 2017.¹⁵ Studies published after 2017 have reported widely varying prevalence rates, ranging from 2.5% to 9.8% across different regions of China.^{2,16–18}

This study aims to measure caregiver-reported ADHD in China. Caregivers were chosen due to they are often the primary observers of their children's behavior and health, and their reports can reflect concerns that may not yet have been diagnosed or treated by healthcare providers. Understanding caregiver perceptions of ADHD and other health conditions provides valuable insight into the level of concern of the disease and highlights potential gaps in access to diagnostic and treatment services. This is especially important for ADHD, as early recognition by caregivers often initiates the process of seeking professional evaluation and support. Specifically, this study aims to 1) measure the prevalence of caregiver-reported ADHD among children and adolescents and 2) explore factors associated with caregiver-reported ADHD in China.

The study region was selected in Shanghai, China, one of the most populous, economically developed, and urbanized cities in the country. Studying caregiver-reported ADHD prevalence in Shanghai allows us to examine its distribution within an urban environment, taking into account unique factors such as environmental stressors, educational pressures, access to healthcare resources, and sociocultural influences that may affect the development and recognition of ADHD. Additionally, the most recent ADHD prevalence study in Shanghai was conducted in 2014, highlighting the need for updated data.¹⁹

Material and Methods

Study Design

We conducted a cross-sectional study in Jiading District, Shanghai, China in March 2024. Shanghai is a major industrial and commercial center in China, and the selected district is located in the northwest of Shanghai, with a population of 1.83 million.

Students attending elementary, junior high, and high school are required to attend an annual physical check-up. A total of ten schools, including five elementary schools, four junior high schools, and one high school, were randomly selected among all the schools in the district. The study team distributed a survey to the head teachers of each class in participating schools. The survey was distributed via a Quick Response (QR) code which is a type of two-dimensional barcode that can store information and be scanned using a smartphone camera or QR code reader. After receiving the QR code, head teachers were asked to share it with caregivers through WeChat, a widely used mobile application in China for communication.²⁰ Participation in both sharing and completing the survey was voluntary.

In the survey, caregivers were asked: “Does your child have any of the following conditions?” The listed conditions included ADHD, obesity, asthma, enuresis, tic disorders, short stature, anorexia, recurrent respiratory tract infections, adenoid hypertrophy, constipation, and precocious puberty. Caregivers were also asked to list any additional conditions not included in the provided list. The survey also collected information of students' gender, date of birth, blood type, and surgery history.

This study adhered to the ethical principles of the Declaration of Helsinki. This study was approved by the Shanghai Municipal Hospital of Traditional Chinese Medicine (2023SHL-KY-27-01). E-written informed consent was obtained from participating caregivers.

Variable

Outcome Measures

The primary outcome was caregiver-reported ADHD, a binary variable coded as 1 if a caregiver selected “yes” for ADHD and 0 if the selection was “no.”

Predicting Variables

Age was treated as a continuous variable. Sex was a binary variable. Education level was categorized as “elementary school” and “middle and high school.” Caregiver-reported conditions include obesity, asthma, enuresis, tic disorders,

short stature, and anorexia, each categorized as “yes” or “no.” These conditions were selected based on their documented association with ADHD in previous studies and the authors’ clinical experience with ADHD diagnosis and treatment.

Statistical Methods

The characteristics of participants were described using frequency and proportion for categorical variables and median and range for the continuous variable, age, due to its non-normal distribution. While comparing the difference in the distribution of characteristics between those with and without caregiver-reported ADHD, χ^2 and Fisher exact tests were used for categorical variables and Mann–Whitney *U*-test was used for age. We then applied adjusted logistic regression analyses to measure factors associated with caregiver-reported ADHD. The predicting variables included in the model were sex,²¹ age,²¹ educational stages,^{22,23} and obesity,²⁴ asthma,²⁵ enuresis,²⁶ tic disorder,²⁷ short stature,²⁸ and anorexia.²⁹ These variables were selected based on their documented association with ADHD in previous studies and the authors’ clinical experience with ADHD diagnosis and treatment. All statistical analyses were performed in Stata/SE version 15.1 (StataCorp LLC).

Results

A total of 5008 children and adolescents whose caregivers completed the questionnaires were included in the study. The basic demographic and clinical characteristics of the participants are summarized in Table 1. The children ranged in age

Table 1 Demographic Characteristics and Caregiver-Reported Health Problems Among a Sample of Children and Adolescents in Shanghai, China (n=5008)

Characteristic	Total (n = 5008) ^a	Caregiver-Reported ADHD		p-Value
		No (n = 4375) ^b	Yes (n = 633) ^b	
	Median (Range) or n (%)			
Age, y				
5–19, Median (Range)	10 (5–19)	10 (5–19)	10 (7–16)	0.020 ^c
Sex				
Male	2592 (51.76)	2182 (84.18)	410 (15.82)	0.000 ^d
Female	2416 (48.24)	2193 (90.77)	223 (9.23)	
Educational Stages				
Elementary level	4809 (96.03)	4186 (87.05)	623 (12.95)	0.001 ^d
Middle & High School	199 (3.97)	189 (94.97)	10 (5.03)	
Obesity				
No	4456 (88.98)	3896 (87.43)	560 (12.57)	0.661 ^d
Yes	552 (11.02)	479 (86.78)	73 (13.22)	
Asthma				
No	4858 (97.00)	4251 (87.51)	607 (12.49)	0.079 ^d
Yes	150 (3.00)	124 (82.67)	26 (17.33)	
Enuresis				
No	4983 (99.50)	4356 (87.42)	627 (12.58)	0.087 ^d
Yes	25 (0.50)	19 (76.00)	6 (24.00)	
Tic disorder				
No	4921 (98.26)	4318 (87.75)	603 (12.25)	0.000 ^d
Yes	87 (1.74)	57 (65.52)	30 (34.48)	
Short stature				
No	4444 (88.74)	3907 (87.92)	537 (12.08)	0.001 ^d
Yes	564 (11.26)	468 (82.98)	96 (17.02)	
Anorexia				
No	4487 (89.60)	3950 (88.03)	537 (11.97)	0.000 ^d
Yes	521 (10.40)	425 (81.57)	96 (18.43)	

Notes: ^aColumn percentage. ^bRow percentage. ^cMann–Whitney *U*-test. ^dChi-square test.

from 5 to 19 years, with a median age of 10 years. The majority (96.03%) were attending elementary school, and 51.76% were male.

Overall, 12.64% of caregivers reported that their child had ADHD. More than 11% of caregivers reported that their child had short stature, followed by obesity (11.02%), anorexia (10.40%), asthma (3%), tic disorder (1.74%), and enuresis (0.50%). Differences were observed between children and adolescents with caregiver-reported ADHD and those without. For example, children whose caregivers reported ADHD were more likely to be male (15.82% vs 9.23%), attend elementary school (12.92% vs 5%), and have comorbid conditions such as tic disorder (34.48% vs 12.25%), short stature (17.02% vs 12.08%), and anorexia (18.43% vs 11.97%) (Table 1).

An adjusted logistic regression model identified key factors associated with caregiver-reported ADHD. Male children had higher odds of being reported as having ADHD (aOR = 1.78; 95% CI, 1.49–2.12). Similarly, attending elementary school was associated with increased odds (aOR = 2.45; 95% CI, 1.23–4.86). Caregivers concern about tic disorder was strongly linked to ADHD (aOR = 3.31; 95% CI, 2.09–5.25). Other significant associations included short stature (aOR = 1.32; 95% CI, 1.03–1.69) and anorexia (aOR = 1.49; 95% CI, 1.16–1.92) (Table 2).

Table 2 Factors Associated with Caregiver-Reported ADHD Among a Sample of Children and Adolescents in Shanghai, China (n=5008)

Characteristic	Adjusted OR ^a (95% CI)
Age	0.97 (0.93, 1.01)
Sex	
Female	1.00 [Reference]
Male	1.78 (1.49–2.12)***
Educational stage	
Middle & High School	1.00 [Reference]
Elementary level	2.45 (1.23–4.86)*
Obesity	
No	1.00 [Reference]
Yes	1.23 (0.86–1.47)
Asthma	
No	1.00 [Reference]
Yes	1.30 (0.84–2.03)
Enuresis	
No	1.00 [Reference]
Yes	1.78 (0.69–4.59)
Tic disorder	
No	1.00 [Reference]
Yes	3.31 (2.09–5.25)***

(Continued)

Table 2 (Continued).

Characteristic	Adjusted OR ^a (95% CI)
Short stature	
No	1.00 [Reference]
Yes	1.32 (1.03–1.69)*
Anorexia	
No	1.00 [Reference]
Yes	1.49 (1.16–1.92)**

Notes: ^aVariables added in the adjusted model were age, sex, educational stages, obesity, asthma, enuresis, tic disorders, short stature, and anorexia. *P < 0.05, **P < 0.01, ***P < 0.001.

Abbreviations: OR, odds ratio; ADHD, Attention Deficit Hyperactivity Disorder.

Discussion

The prevalence of caregiver-reported ADHD in this study is almost double the estimated prevalence of ADHD in China.² While these results might reflect a true higher prevalence of childhood ADHD in Shanghai, there are a few possible explanations for these findings. First, the existing reviews summarized findings from the past decades, which lack current data. Additionally, we have observed a trend of increasing ADHD prevalence in China, likely due to higher screening rates.¹⁷ Moreover, Shanghai is one of the most highly developed regions in China, which may increase the likelihood of diagnosis and information dissemination compared to other regions.

However, we do need to consider the limitations of relying on reported diagnoses of ADHD. First, caregivers may overestimate or underestimate ADHD symptoms based on their personal perceptions and their level of awareness of ADHD as well as the broader diagnostic criteria of ADHD. Some symptoms of ADHD might be misinterpreted as normal childhood behavior, including high energy and inattention for specific settings which fall within the normal developmental range for a child's age. Also, many conditions, including anxiety, autism spectrum disorder, and oppositional defiant disorder, can be misread by caregivers as ADHD due to partial symptom overlap between these conditions. Additionally, the Chinese translation of ADHD as “Duo Dong Zheng” which means “hyperactivity disorder”. The translation over emphasis on the hyperactive aspect of the diseases and neglects other symptoms of ADHD, including executive function challenges and emotional regulation difficulties.³⁰ This culturally biased interpretation may lead some caregivers to report or assume that their child has ADHD based solely on hyperactive behavior.³¹

Treating ADHD requires considering comorbid conditions and those conditions also play an important role in diagnosing ADHD. Thus, the factors associated with caregiver-reported ADHD provide valuable insights. Male children were more likely to be reported as having ADHD, consistent with established findings that boys display a higher prevalence of ADHD. This is often attributed to boys exhibiting externalizing behaviors, such as hyperactivity and impulsivity.³² The finding that children attending elementary school had significantly higher odds of ADHD concern aligns with previous research indicating that ADHD is most frequently diagnosed during early childhood.³³ Caregiver-reported tic disorders showed a strong association with ADHD, reflecting the well-documented comorbidity between these conditions, likely due to shared neurobiological pathways involving dopamine dysfunction.²⁷ The observed association between short stature and ADHD is consistent with studies suggesting that growth delays may result from neurodevelopmental disruptions or the side effects of ADHD medications.^{34,35} Similarly, the link between anorexia and ADHD aligns with evidence that the two conditions share psychological and neurobiological characteristics, such as impulsivity and executive function deficits.^{29,36,37} These health conditions are also intertwined. For example, children with anorexia often exhibit prolonged mealtimes and may display behaviors such as playing or becoming distracted while eating, which are associated with ADHD. Additionally, these poor eating habits could negatively impact growth and development.

As we discussed above, the diagnosis of ADHD is complicated and should be carried out by healthcare providers. Extra steps should be taken to increase examination and treatment rates for the disease. For example, schools could consider providing health

education lectures for children, caregivers, and teachers to increase health literacy of ADHD. Healthcare providers could consider providing affordable screening programs for children whose caregivers have concerned about having ADHD.

This study has several limitations that should be considered when interpreting the results and suggesting directions for future research. First, the study was conducted in a single district in Shanghai and could not fully represent the population across Shanghai or China. Second, the study focused on caregiver-reported ADHD rather than clinically diagnosed ADHD, which could introduce bias. Third, the study did not use a standardized ADHD rating scale for caregivers to report the condition. Additionally, the study measured only a limited number of factors that might be associated with ADHD, which may not capture the full range of factors associated ADHD. Future research should aim to ask caregivers whether their children have been clinically diagnosed with ADHD, use standardized scales for ADHD reporting, expand data collection to other regions, apply a probability sampling strategy, and consider additional factors that might be associated with ADHD.

Conclusion

This study found that the prevalence of caregiver-reported ADHD was nearly twice the estimated national rate in China, which may reflect increased awareness, improved screening, and regional differences, particularly in highly developed areas like Shanghai. However, caregiver-reported ADHD has limitations, as caregivers may misinterpret symptoms due to personal perceptions, cultural biases, and the broad diagnostic criteria of ADHD, leading to potential over- or under-estimation. Several factors were associated with ADHD reports, including male gender, early school years, tic disorders, short stature, and anorexia, suggesting the importance of considering comorbid conditions in diagnosis. Given these findings, efforts should be made to improve ADHD reporting through standardized assessments, expanded screening programs for children and adolescents, and increased health education for caregivers and teachers.

Acknowledgments

The authors would like to express their gratitude to all the participants who volunteered to involved in this study.

Funding

The authors appreciate the funding support from High-level Key Disciplines Construction Project of Traditional Chinese Medicine (Pediatrics of Traditional Chinese Medicine) under the National Administration of Traditional Chinese Medicine (No. B01A2).

Disclosure

The authors report no conflicts of interest in this work.

References

- Salari N, Ghasemi H, Abdoli N, et al. The global prevalence of ADHD in children and adolescents: a systematic review and meta-analysis. *Ital J Pediatr.* 2023;49(1):48. doi:10.1186/s13052-023-01456-1
- Li F, Cui Y, Li Y, et al. Prevalence of mental disorders in school children and adolescents in China: diagnostic data from detailed clinical assessments of 17,524 individuals. *J Child Psychol Psychiatr.* 2022;63(1):34–46. doi:10.1111/jcpp.13445
- Mucci F, Carpita B, Pagni G, et al. Lifetime evolution of ADHD treatment. *J Neural Transm.* 2021;128(7):1085–1098. doi:10.1007/s00702-021-02336-w
- Agnew-Blais JC, Polanczyk GV, Danese A, Wertz J, Moffitt TE, Arseneault L. Evaluation of the Persistence, Remission, and Emergence of Attention-Deficit/Hyperactivity Disorder in Young Adulthood. *JAMA Psychiatry.* 2016;73(7):713–720. doi:10.1001/jamapsychiatry.2016.0465
- Saylor KE, Amann BH. Impulsive Aggression as a Comorbidity of Attention-Deficit/Hyperactivity Disorder in Children and Adolescents. *J Child Adolesc Psychopharmacol.* 2016;26(1):19–25. doi:10.1089/cap.2015.0126
- Sibley MH, Evans SW, Serpell ZN. Social Cognition and Interpersonal Impairment in Young Adolescents with ADHD. *J Psychopathol Behavioral Asses.* 2009;32(2):193–202. doi:10.1007/s10862-009-9152-2
- Fonagy P, Luyten P. Conduct problems in youth and the RDoC approach: a developmental, evolutionary-based view. *Clin Psychol Rev.* 2018;64:57–76. doi:10.1016/j.cpr.2017.08.010
- Lipschitz DS, Morgan CA, Southwick SM. Neurobiological disturbances in youth with childhood trauma and in youth with conduct disorder. In: *Trauma and Juvenile Delinquency.* Vol. 2014. 2014:149–174.
- Spira EG, Fischel JE. The impact of preschool inattention, hyperactivity, and impulsivity on social and academic development: a review. *J Child Psychol Psychiatr.* 2005;46(7):755–773. doi:10.1111/j.1469-7610.2005.01466.x
- Barry TD, Lyman RD, Klinger LG. Academic Underachievement and Attention-Deficit/Hyperactivity Disorder. *J School Psychol.* 2002;40(3):259–283. doi:10.1016/S0022-4405(02)00100-0

11. Tian SA-O, Xiao YA-O, Deng XA-O, Zhang WA-O. Retrospective Study on the Therapeutic Effect of Repetitive Transcranial Magnetic Stimulation Combined with Tiapride Hydrochloride Tablets in Children with Attention Deficit Hyperactivity Disorder. *Alpha Psychiatry*. 2024;25(3):382–387. doi:10.5152/alphapsychiatry.2024.231442
12. Liao WA-O, Li H, Liu Q, et al. Comparison of Brain Function Between Medication-Naïve ADHD with and without Comorbidity in Chinese Children Using Resting-State fNIRS. *Alpha Psychiat*. 2024;25(4):485.
13. Harpin V, Mazzone L, Raynaud JP, Kahle J, Hodgkins P. Long-Term Outcomes of ADHD: a Systematic Review of Self-Esteem and Social Function. *J Atten Disord*. 2016;20(4):295–305. doi:10.1177/1087054713486516
14. Liu A, Xu Y, Yan Q, Tong L. The Prevalence of Attention Deficit/Hyperactivity Disorder among Chinese Children and Adolescents. *Sci Rep*. 2018;8(1):11169. doi:10.1038/s41598-018-29488-2
15. Wang T, Liu K, Li Z, et al. Prevalence of attention deficit/hyperactivity disorder among children and adolescents in China: a systematic review and meta-analysis. *BMC Psychiatry*. 2017;17(1):32. doi:10.1186/s12888-016-1187-9
16. Shen L, Wang C, Tian Y, Chen J, Wang Y, Yu G. Effects of Parent-Teacher Training on Academic Performance and Parental Anxiety in School-Aged Children With Attention-Deficit/Hyperactivity Disorder: a Cluster Randomized Controlled Trial in Shanghai, China. *Front Psychol*. 2021;12:733450. doi:10.3389/fpsyg.2021.733450
17. Lu T, Li L, Tang Y, Leavey G. ADHD and family life: a cross-sectional study of ADHD prevalence among pupils in China and factors associated with parental depression. *PLoS One*. 2024;19(3):e0281226. doi:10.1371/journal.pone.0281226
18. Pang X, Wang H, Dill SE, et al. Attention Deficit Hyperactivity Disorder (ADHD) among elementary students in rural China: prevalence, correlates, and consequences. *J Affect Disord*. 2021;293:484–491. doi:10.1016/j.jad.2021.06.014
19. Jin W, Du Y, Fau-Zhong X, Zhong X, David C. Prevalence and contributing factors to attention deficit hyperactivity disorder: a study of five- to fifteen-year-old children in Zhabei District, Shanghai. *Asia-Pacific Psychiatry*. 2014;6(4):397–404. doi:10.1111/appy.12114
20. Lin Y. Number of WeChat Users (2014–2024). 2024, Available fom: <https://www.oberlo.com/statistics/number-of-wechat-users>. Accessed April 10, 2024.
21. Seahill L, Schwab-Stone M. Epidemiology of ADHD in School-Age Children. *Child Adolescent Psychiatric Clin North America*. 2000;9(3):541–555. doi:10.1016/S1056-4993(18)30106-8
22. Evans SW, Langberg JM, Egan T, Molitor SJ. Middle School-based and High School-based Interventions for Adolescents with ADHD. *Child Adolescent Psychiatric Clin North America*. 2014;23(4):699–715. doi:10.1016/j.chc.2014.05.004
23. Wilens TE, Spencer TJ. Understanding Attention-Deficit/Hyperactivity Disorder from Childhood to Adulthood. *Postgraduate Med*. 2015;122(5):97–109. doi:10.3810/pgm.2010.09.2206
24. Cortese S, Moreira-Maia CR, St Fleur D, Morcillo-Penalver C, Rohde LA, Faraone SV. Association Between ADHD and Obesity: a Systematic Review and Meta-Analysis. *Am J Psychiatry*. 2016;173(1):34–43. doi:10.1176/appi.ajp.2015.15020266
25. Mogensen N, Larsson H, Lundholm C, Almqvist C. Association between childhood asthma and ADHD symptoms in adolescence--a prospective population-based twin study. *Allergy*. 2011;66(9):1224–1230. doi:10.1111/j.1398-9995.2011.02648.x
26. Khazaie H, Eghbali F, Amirian H, Moradi MR, Ghadami MR. Risk Factors of Nocturnal Enuresis in Children with Attention Deficit Hyperactivity Disorder. *Shanghai Arch Psychiatry*. 2018;30(1):20–26. doi:10.11919/j.issn.1002-0829.216088
27. Banaschewski T, Neale BM, Rothenberger A, Roessner V. Comorbidity of tic disorders & ADHD: conceptual and methodological considerations. *Eur Child Adolesc Psychiatry*. 2007;16 Suppl 1(S1):5–14. doi:10.1007/s00787-007-1002-8
28. Ahlberg R, Garcia-Argibay M, Rietz ED, et al. Associations Between Attention-Deficit/Hyperactivity Disorder (ADHD), ADHD Medication, and Shorter Height: a Quasi-Experimental and Family-Based Study. *J Am Acad Child Adolesc Psychiatry*. 2023;62(12):1316–1325. doi:10.1016/j.jaac.2023.03.015
29. Villa FM, Crippa A, Rosi E, Nobile M, Brambilla P, Delvecchio G. ADHD and eating disorders in childhood and adolescence: an updated minireview. *J Affect Disord*. 2023;321:265–271. doi:10.1016/j.jad.2022.10.016
30. Hu X. Exploring ethical issues in the Chinese translation of medical terms: the convergence of translation ethics and medical ethics. *J Clin Technol Theory*. 2024;1(1):35–40. doi:10.54254/3049-5458/1/2024007
31. Feng A, O'Neill S, Rostain AL. Contributors to Underdiagnosis of ADHD among Asian Americans: a Narrative Review. *J Atten Disord*. 2024;28(12):1499–1519. doi:10.1177/10870547241264113
32. Gaub M, Carlson CL. Gender differences in ADHD: a meta-analysis and critical review. *J Am Acad Child Adolesc Psychiatry*. 1997;36(8):1036–1045. doi:10.1097/00004583-199708000-00011
33. Bonati M, Cartabia M, Zanetti M, et al. Age level vs grade level for the diagnosis of ADHD and neurodevelopmental disorders. *Eur Child Adolesc Psychiatry*. 2018;27(9):1171–1180. doi:10.1007/s00787-018-1180-6
34. Davallow Ghajar L, DeBoer MD. Children With Attention-Deficit/Hyperactivity Disorder Are at Increased Risk for Slowed Growth and Short Stature in Early Childhood. *Clin Pediatr*. 2020;59(4–5):401–410. doi:10.1177/0009922820902437
35. Carucci S, Balia C, Gagliano A, et al. Long term methylphenidate exposure and growth in children and adolescents with ADHD. A systematic review and meta-analysis. *Neurosci Biobehav Rev*. 2021;120:509–525. doi:10.1016/j.neubiorev.2020.09.031
36. Svedlund NE, Norring C, Ginsberg Y, von Hauswolff-Juhlin Y. Symptoms of Attention Deficit Hyperactivity Disorder (ADHD) among adult eating disorder patients. *BMC Psychiatry*. 2017;17(1):19. doi:10.1186/s12888-016-1093-1
37. Ptacek R, Stefano GB, Weissenberger S, et al. Attention deficit hyperactivity disorder and disordered eating behaviors: links, risks, and challenges faced. *Neuropsychiatr Dis Treat*. 2016;12:571–579. doi:10.2147/NDT.S68763

Neuropsychiatric Disease and Treatment

Dovepress
Taylor & Francis Group

Publish your work in this journal

Neuropsychiatric Disease and Treatment is an international, peer-reviewed journal of clinical therapeutics and pharmacology focusing on concise rapid reporting of clinical or pre-clinical studies on a range of neuropsychiatric and neurological disorders. This journal is indexed on PubMed Central, the 'PsycINFO' database and CAS, and is the official journal of The International Neuropsychiatric Association (INA). The manuscript management system is completely online and includes a very quick and fair peer-review system, which is all easy to use. Visit <http://www.dovepress.com/testimonials.php> to read real quotes from published authors.

Submit your manuscript here: <https://www.dovepress.com/neuropsychiatric-disease-and-treatment-journal>