

STROBE Statement—checklist of items that should be included in reports of observational studies

	<b>Item No.</b>	<b>Recommendation</b>	<b>Page No.</b>	<b>Relevant text from manuscript</b>
<b>Title and abstract</b>	1	(a) Indicate the study’s design with a commonly used term in the title or the abstract	1	To explore the relationship between attention deficit hyperactivity disorder and bronchial asthma in children and analyze its influencing factors.
		(b) Provide in the abstract an informative and balanced summary of what was done and what was found	1-2	In this study, the incidence of asthma in children with ADHD was analyzed by retrospective analysis, and its influencing factors were analyzed.
<b>Introduction</b>				
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	2-3	In recent years, the incidence of attention deficit hyperactivity disorder ( ADHD ) in children has been on the rise, but its etiology and pathogenesis have not been clarified. Bronchial asthma is a heterogeneous disease with recurrent cough, wheezing, shortness of breath and chest tightness as the main clinical manifestations. Previous studies have shown that childhood asthma can increase the risk of ADHD and the core symptoms of ADHD. At present,

				there are few reports on the relationship between ADHD and asthma in children. Therefore, exploring and analyzing the relationship between the two diseases and their influencing factors will help to better understand the etiology of ADHD and provide new methods for early prevention and treatment of ADHD.
Objectives	3	State specific objectives, including any prespecified hypotheses	3	In this study, the incidence of asthma in children with ADHD was retrospectively analyzed, and its influencing factors were analyzed, so as to provide reference for clinical prevention and treatment of ADHD with asthma.
<b>Methods</b>				
Study design	4	Present key elements of study design early in the paper	3	In this study, a retrospective analysis method was used to select children with ADHD admitted to our hospital from September 2018 to October 2023 as the ADHD group, and children without ADHD who underwent physical examination in our hospital during the same period were selected as the

				healthy control group.
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	3	This is a retrospective cohort study conducted from September 2018 to October 2023 in Dongying People's Hospital.
Participants	6	<p>(a) <i>Cohort study</i>—Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up</p> <p><i>Case-control study</i>—Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls</p> <p><i>Cross-sectional study</i>—Give the eligibility criteria, and the sources and methods of selection of participants</p>	3	<p>The inclusion criteria of ADHD group were as follows : ( 1 ) aged 4-14 years old, meeting the diagnostic criteria of ADHD in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders ( DSM-5 ), and at least 6 of the 9 symptoms in each dimension should be met to confirm the diagnosis ; ( 2 ) Wechsler Intelligence Scale for Children ( C-WISC ) IQ test score <math>\geq</math> 85 points ; 3 Complete clinical data. Exclusion criteria : ( 1 ) combined with other mental diseases ; ( 2 ) Those who have taken anti-ADHD drugs for more than 1 year ; ( 3 ) Patients with neurological abnormalities.</p> <p>Inclusion criteria of healthy control group : ( 1 ) age 4 ~ 14 years old ; ( 2 ) Complete clinical data. Exclusion criteria : ( 1 ) combined with developmental disorders, mental</p>

				retardation and other diseases ; ( 2 ) Abnormal nervous system.
		(b) <i>Cohort study</i> —For matched studies, give matching criteria and number of exposed and unexposed <i>Case-control study</i> —For matched studies, give matching criteria and the number of controls per case	3	Previous studies have found that the prevalence of ADHD and asthma in children is 9 % and 3.02 % respectively, and the comorbidity rate of ADHD and asthma is 10.9 %. According to the ratio of 1 : 3, that is, $m = \text{control group sample size ( } m_0 \text{ )} / \text{observation group sample size ( } n_1 \text{ )} = 3$ , set the test level $\alpha = 0.05$ , grasp degree $\beta$ is 0.2, the calculated ADHD sample size is 183 cases, and the sample size of the healthy control group is 549.
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable		N/A
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	3-4	The gender, age, nationality, feeding patterns at birth, gestational age at delivery, whether there was brain injury, and family history of allergic asthma were collected. Parental data of the two groups of children were collected, including the highest educational level of parents, monthly income per capita of the family, maternal

				<p>complications during pregnancy, use of asthma allergy treatment drugs during pregnancy, smoking history during pregnancy, anxiety and depression during pregnancy, and parental relationship. Multivariate Logistic regression analysis was used to analyze the risk factors of ADHD children with asthma.</p>
Bias	9	Describe any efforts to address potential sources of bias		N/A
Study size	10	Explain how the study size was arrived at	3	<p>Previous studies have found that the prevalence of ADHD and asthma in children is 9 % and 3.02 % respectively, and the comorbidity rate of ADHD and asthma is 10.9 %. According to the ratio of 1 : 3, that is, <math>m = \text{control group sample size ( m0 )} / \text{observation group sample size ( n1 )} = 3</math>, set the test level <math>\alpha = 0.05</math>, grasp degree <math>\beta</math> is 0.2, the calculated ADHD sample size is 183 cases, and the sample size of the healthy control group is 549.</p>

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Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	3	Children with ADHD admitted to Dongying People 's Hospital from September 2018 to October 2023 were selected as ADHD group, and children without ADHD who underwent physical examination in our hospital during the same period were selected as healthy control group.
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding	3-4	SPSS25.0 was used to analyze and process the data, and GraphPad Prism8 was used for drawing. The measurement data conforming to the normal distribution were expressed as ( mean $\pm$ standard deviation ), and the t test was used for comparison. The count data were expressed as ' cases ', and the chi-square test was used for comparison. Multivariate Logistic regression analysis was used to analyze the risk factors of ADHD children with asthma. The statistical threshold probability was set to $P < 0.05$ .
		(b) Describe any methods used to examine subgroups and interactions	3-4	SPSS25.0 was used to analyze the data. The measurement data conforming to the normal distribution were expressed as ( mean $\pm$ standard deviation ), and the t test was used for comparison. The count data were expressed as '

				cases', and the chi-square test was used for comparison. Multivariate Logistic regression analysis was used to analyze the risk factors of ADHD children with asthma. The statistical threshold probability was set to $P < 0.05$ .
		(c) Explain how missing data were addressed		N/A
		(d) <i>Cohort study</i> —If applicable, explain how loss to follow-up was addressed <i>Case-control study</i> —If applicable, explain how matching of cases and controls was addressed <i>Cross-sectional study</i> —If applicable, describe analytical methods taking account of sampling strategy	3	Children with ADHD admitted to our hospital from September 2018 to October 2023 were selected as the ADHD group, and children without ADHD who underwent physical examination in our hospital during the same period were selected as the healthy control group.
		(e) Describe any sensitivity analyses		
<b>Results</b>				
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed		Finally, 183 children in the ADHD group and 549 children in the healthy control group were included.
		(b) Give reasons for non-participation at each stage (c) Consider use of a flow diagram		
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	4-5	There were 183 children in the ADHD group and 549 children in the healthy control group. There was no significant difference in clinical data such as gender and age between the two groups ( $P >$

				0.05 ).
		(b) Indicate number of participants with missing data for each variable of interest		
		(c) <i>Cohort study</i> —Summarise follow-up time (eg, average and total amount)		
Outcome data	15*	<i>Cohort study</i> —Report numbers of outcome events or summary measures over time		
		<i>Case-control study</i> —Report numbers in each exposure category, or summary measures of exposure		
		<i>Cross-sectional study</i> —Report numbers of outcome events or summary measures		
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	5-6	There were statistically significant differences between the ADHD group and the control group in maternal complications during pregnancy, the use of asthma allergy treatment drugs during pregnancy, anxiety and depression during pregnancy, and parental relationship ( $P < 0.05$ ).Multivariate Logistic regression analysis showed that family history of asthma allergies, maternal comorbidities during pregnancy, use of asthma allergies during pregnancy, anxiety and depression during pregnancy, and parental relationship were independent risk factors for asthma in ADHD children ( $P < 0.05$ ).
		(b) Report category boundaries when continuous variables were categorized		
		(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period		

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Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses		N/A
<b>Discussion</b>				
Key results	18	Summarise key results with reference to study objectives	9-10	Children with ADHD are more likely to have asthma than healthy control children. Family history of asthma, maternal adverse factors during pregnancy, and parental relationship all affect the risk of asthma in children with ADHD.
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	11	This study is a retrospective study, and the sample size is small, which may cause some bias to the results of the study. In the future, the sample size will be expanded to analyze the specific pathogenesis of ADHD children with asthma.
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	11	Children with ADHD are more likely to have asthma than healthy control children. Family history of asthma, maternal adverse factors during pregnancy, and parental relationship all affect the risk of comorbid asthma in children with ADHD. Targeted interventions can be taken for the above factors to reduce the risk of comorbid asthma.
Generalisability	21	Discuss the generalisability (external validity) of the study results	11	In our study, we also observed that maternal adverse factors during pregnancy and parental relationship can affect the comorbidity of asthma in children with ADHD.

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Clinically, targeted interventions can be taken for the above factors to reduce the risk of comorbidity of asthma.

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**Other information**

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Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based
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N/A

\*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

**Note:** An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at <http://www.plosmedicine.org/>, Annals of Internal Medicine at <http://www.annals.org/>, and Epidemiology at <http://www.epidem.com/>). Information on the STROBE Initiative is available at [www.strobe-statement.org](http://www.strobe-statement.org).