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Influential factors of ADHD in children: a systematic review and meta-analysis

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ADMINISTRATIVE INFORMATION

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Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 18 October 2024 and was last updated on 18 October 2024.

INTRODUCTION

Review question / Objective This paper conducted a systematic review of the related influencing factors of ADHD in children by Meta-analysis, and explored the influence of different influencing factors on the onset of ADHD. The included studies were case-control studies and cohort studies.

Condition being studied Genetic and environmental factors jointly affect the risk of ADHD in a variety of ways. At present, there have been many studies on the influencing factors of ADHD, but there is no study involving large samples and various influencing factors in one article, and the influence degree of each influencing factor on the onset of ADHD is not clear. Therefore, this paper systematically reviews the related influencing factors of ADHD children through the method of Meta-analysis, and explores the influence of different influencing factors on the

onset of ADHD, so as to provide an important basis for the screening, prevention and early intervention of ADHD children.

METHODS

Participant or population ADHD children.

Intervention ADHD Children exposed to different factors.

Comparator ADHD Children not exposed to different factors.

Study designs to be included Case-control study and cohort study.

Eligibility criteria Inclusion criteria: ① Children with attention deficit hyperactivity disorder, age ≤18 years old; ② Study types included case-control study and cohort study; ③ Related

research on the influencing factors of ADHD; ④ The language is Chinese or English. Exclusion criteria: ① The full text could not be obtained; ② Incomplete data; ③ low quality literature; ④ reviews, meetings, case reports, etc. (5) non-Chinese or English literature; ⑥ Repeated publication of literature.

Information sources Pubmed, Web of Science, The Cochrane Library and Embase databases were searched for English literature, and China National Knowledge Infrastructure (CNKI), Wanfang Data Knowledge Service Platform and VIP database were searched for Chinese core literature.

Main outcome(s) Family members with ADHD history, maternal and fetal factors during pregnancy, adverse factors during delivery, children's bad eating habits and different dietary patterns, parents' emotional conflict, improper parenting style, children's screen time, poor diet during pregnancy, children's own diseases and parents' diseases before pregnancy were risk factors for ADHD, and breastfeeding was a protective factor for ADHD.

Quality assessment / Risk of bias analysis The risk of bias of the included studies was evaluated by three researchers independently. Case-control and cohort studies were evaluated using the Newcastle-Ottawa scale (NOS) on a scale of 9, with 7-9 as high quality, 4-6 as moderate quality, and 0-3 as low quality.

Strategy of data synthesis StataCorp Stata (version 15) was used for meta-analysis. The OR value and 95% CI of the influencing factors in the original study were combined after natural log transformation. The transformation method was as follows: effect size $ES = \ln OR$, standard error of effect size $SE = [\ln(\text{upper limit of OR}) - \ln(\text{lower limit of OR})] / 3.92$. The heterogeneity between the studies was determined by I^2 value. If there was significant heterogeneity ($I^2 > 50\%$ or $P < 0.1$), the random effect model was used for statistical analysis. If there was no significant heterogeneity ($I^2 \leq 50\%$ or $P \geq 0.1$), the fixed effect model was used. When significant heterogeneity appeared, subgroup analysis and Meta-regression were used to obtain the source of heterogeneity, and sensitivity analysis was used to test the stability of the results of Meta-analysis. If there was heterogeneity, Egger's test was used to quantify publication bias.

Subgroup analysis No subgroup analyses were performed.

Sensitivity analysis Sensitivity analysis was performed by STATA software, and the sensitivity of each article was reflected by the change of effect size after deleting a certain article.

Language restriction Chinese; English.

Country(ies) involved China.

Keywords Attention deficit hyperactivity disorder; Children; Risk factors; Protective factors; Meta-analysis.

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