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The Impact of Parental Care and Management on the Relationship Between ADHD and Depression in Children

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Abstract. The study investigated how the severity of ADHD symptoms relates to the severity of depressive symptoms in children aged 7 to 9, while also looking at how parental care and management behaviors, as well as parents' own mental health history, might influence this link. Participants included 73 second graders and their primary guardians from a public primary school in Beijing. We gathered data via electronic questionnaires measuring children's ADHD and depressive symptoms, caregivers' management and support behaviors, and the parents' mental health history. Moderation analysis was performed in R. The findings revealed a strong positive association between ADHD and depressive symptoms. Although parental care and management displayed a weak moderating influence, parents' mental health history was a robust and significant predictor of the children's depressive severity. These results highlight the potential of strengthening parental support strategies in non-pharmacological interventions for children struggling with ADHD.

Keywords: ADHD, depression, parental care, parental management, children

1. Introduction

Attention-deficit/hyperactivity disorder (ADHD) is a common neurodevelopmental disorder characterized by symptoms of inattention, hyperactivity, and impulsivity that emerge during the childhood years. Previous studies have continually shown that children with ADHD have an increased risk for later depression when compared with neurotypical peers. Such comorbidity exerts a cumulative burden on children that interferes with their academic achievement, compromises social relationships, and diminishes overall quality of life.

While there is substantial literature about medication as a primary intervention, family-related variables- which are more amenable to change-have received relatively scant attention. Given that parents are central to the everyday environments of their children, their care-giving and behavioral management choices are well-positioned to shape the mental health trajectories of children with ADHD. However, as a rule, parents are provided with much information about pharmacotherapy but receive limited, specific guidance about everyday family practices that might buffer against depression.

In light of this, the present study investigates the degree to which parental care and management practices moderate the association between ADHD and major depression among children aged 7 to 9. It will further consider the moderating role of parental mental health history. Results are intended

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to inform the development of targeted non-pharmacological interventions that can be provided within the family setting, thus extending the therapeutic repertoire available to children struggling with both ADHD and depression.

2. Literature review

2.1. The relationship between ADHD and depression

Indeed, many studies pinpoint ADHD as a certain risk factor for subsequent depression. For instance, Riglin et al. [1] found that children diagnosed with ADHD are more likely to develop recurrent depression into adolescence. Furthermore, they presented data that the genetic liability conferring risk of ADHD seems to directly contribute to increasing the risk of severe depressive episodes. Therefore, taken together, these findings suggest that ADHD is not just comorbid with major depression but rather ADHD seems to create a diathesis through which depressive symptoms both emerge and endure as the affected children grow older. Regarding treatment, according to Brown et al. [2], robust evidence supports stimulant medications as a first-line intervention for managing the core symptoms of ADHD in school-aged children, while behavioral therapies alone show limited efficacy.

2.2. The role of parental factors

Parental effects play a central role in the mental health of children with ADHD. Smit et al. [3] found that parental depressive symptoms, ADHD symptoms, and oppositional defiant symptoms of children, in addition to parenting behavior, are not independent of one another and that interrelations may differ. This could mean that both the parents' mental health and the quality of parenting together influence the developmental course of a child's psychosocial problems. In a separate study, Eadeh et al. [4] showed that social difficulties in middle childhood can result in depressive symptoms during adolescence through parent-adolescent conflict, which acts as a bridge. Similar patterns were also shown for academic struggles, with conflicts affecting the strength of the relationship. These results put forth the reality that emotional, social, and academic functioning when considering children is inextricably woven with the quality of parent-child relationships and the broader family context.

2.3. Research gaps

While prior research has addressed the connection of ADHD with depression and some parenting factors, gaps remain. Riglin et al. [1] fills the gap concerning the moderating effect of guardians' behaviors on the ADHD-depression relationship in younger cohorts, but deeper attention is needed on specific parental behaviors of care-giving and management. Smit et al. [3] fills the gap in the subgap of the moderating effect of various parental behaviors on the ADHD-depression relationship, but the literature concerning 7 to 9-year-old children is relatively sparse. Eadeh et al. [4] fills the gap concerning the influence of parental behaviors on the ADHD-depression relationship in younger children, but the literature on the combined impact of parental care-giving, management, and mental health history is inadequate.

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3. Methodology

3.1. Research design

This study employs a cross-sectional design to examine the relationship between ADHD severity and depression in children, alongside the roles of parental care and management and the family mental health history. The independent variable is severity of ADHD symptoms, the dependent variable is depression severity, the moderators are the level of parental care and management, and the covariate is parents' mental health history.

3.2. Participants

A total of seventy-three second-grade students (38 males, 35 females; ages 7 to 9 years) along with their primary caregivers were recruited from a public primary school in Beijing via school-based advertisement. Participants provided online informed consent and completed electronic questionnaires anonymously through Wenjuanxing. Student-parent pairs were linked through unique identification codes without recording personal identifiers.

3.3. Measures

ADHD symptoms in children: An 18-item non-standardized ADHD symptom checklist was constructed with a 4-point Likert response scale: “How often do you struggle to focus?”. Response options were: 1 (never) to 4 (always). Within this scale, greater values reflect more severe ADHD symptoms.

Depressive symptoms in children: Children's depressive symptoms were assessed using The PHQ-9 designed for children [5] which comprises 9 items, each ranging from 0 to 3. A higher score results in greater depressive symptoms.

Parental care and management: Guardians received a 16-item questionnaire measuring care and management of child's behavior on a 5-point Likert scale. 1 (never) to 5 (always). Higher scores suggested more care and management.

Depressive symptoms in parents: Parental depressive symptoms were assessed through The PHQ-9 designed for patients.

Psychiatric history in parents: Guardians were inquired on whether they have a clinician-diagnosed psychiatric history (yes/no).

To verify the quality of the data, attention checks (e.g. “Please select 'Yes'”) were implemented.

3.4. Analysis of the data

The data collection was done via Wenjuanxing, while the subsequent analysis was performed using the R software. With the history of parental mental health, alongside the child's age and sex, regression covariates were analyzed to evaluate the moderating impact of parental care and management on the association between children's ADHD and depressive symptoms. The following two models were built:

Model 1: Depression ~ Parentdepression + Age + Sex + ADHD + ADHD * Caring

Model 2: Depression ~ Parentdepression + Age + Sex + ADHD + ADHD * Management

DOI: 10.54254/2753-7048/2026.HT31144

4. Results

4.1. Descriptive statistics

A total of 73 student samples were included in this study. Descriptive statistical analysis was conducted on three key variables: student age, total depression score, and total ADHD score. The results are shown in Table below.

Table 1. Descriptive statistics of children's key variables

Variable	Count	Average	Standard Deviation	Minimum Value	25% Percentile	75% Percentile	Maximum
Age	73.00	7.97	0.47	7.00	8.00	8.00	9.00
Depression Score	73.00	1.66	2.33	0.00	0.00	3.00	12.00
ADHD Score	73.00	8.41	6.65	0.00	2.00	12.00	29.00

The sample size of parents in this study was 80. Descriptive statistical analysis was conducted on the relevant variables, and the results are shown in the following table:

Table 2. Descriptive statistics of parental key variables

Variable	Count	Average	Standard Deviation	Minimum Value	25% Percentile	Median	75% Percentile	Maximum
Caring Score	80.00	34.84	4.17	24.00	32.75	36.00	38.00	40.00
Management Score	80.00	80.00	25.90	2.67	21.00	24.00	26.00	27.00
Depression Score	80.00	1.98	2.42	0.00	0.00	1.00	3.00	8.00

4.2. Model results

4.2.1. Model 1: depression ~ parentdepression + age + sex + ADHD + ADHD * caring

The results of Model 1 are shown in the following table:

Table 3. Regression results of model 1

Variable	Estimate	Std. Error	t Value	Pr(>|t|)
(Intercept)	4.526784	5.449385	0.831	0.4089
Parental Depression	0.255785	0.101705	2.515	0.0142*
Age	-0.936763	0.513012	-1.826	0.0721.
Sex (sex0)	-0.303172	0.433963	-0.699	0.4871
Total ADHD Score	0.581122	0.237665	2.445	0.0170
Parental Caring	0.087062	0.099727	0.873	0.3856
ADHD Score: Caring	-0.013068	0.006983	-1.872	0.0654.

4.2.2. Model 2: depression ~ parentdepression + age + sex + ADHD + ADHD * management

The results of Model 2 are shown in the following table:

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Table 4. Regression results of model 2

Variable	Estimate	Std. Error	t Value	Pr(>|t|)
(Intercept)	4.53930	4.89739	0.927	0.35713
Parental Depression	0.25216	0.09196	2.742	0.00772**
Age	-1.01732	0.52649	-1.932 .	0.05732.
Sex (sex0)	-0.27833	0.44259	-0.629	0.53146
Total ADHD Score	0.76241	0.32930	2.315	0.02349*
Parental Management	0.13696	0.12872	1.064	0.29092
ADHD Score: Management	-0.02323	0.01250	-1.858	0.06726.

4.3. Interpretation of results

Influence of Students' Total ADHD Scores: In both model analyses, students' total ADHD scores significantly, and positively predict their depression scores. In other words, ADHD symptom severity directly correlates with depression levels among students, which aligns with the research hypothesis.

Moderating Role of Parental Behaviors: The main effects of both parental management and supervision as well as parental caring do not have significant effects. The p-values of the interaction effects (ADHD total score × management/caring) come close to 0.05 (Model 1: 0.0654; Model 2: 0.06726). This indicates, albeit weak, some moderate influence in the relationship between the ADHA symptoms and depression through parental behaviors (confirmation with a larger sample is warranted).

Impact of Parental Mental Illness (Parentdepression): In both models, parental mental health disorders significantly and positively predict the total depression scores of students. This suggests students have a greater risk of depression with a parental history of mental disorders, supporting the hypothesis regarding the influence of family mental health history on child development.

5. Discussion

5.1. Key outcomes

The current study confirmed that the severity of ADHD and depression in children is significantly positively correlated, which follows earlier research [1]. This suggests that ADHD alone is a notable risk factor for depression among children aged 7 to 9, and management of ADHD is likely to lower the risk of developing depression later on.

Parents' caregiving and management styles tended to have a weak moderating influence on the relation between ADHD and depression. While the influence is weak, the finding suggests that better management and caregiving by parents may reduce the adverse influence of ADHD on depression. This is in accordance with the belief that parents do have some influence on the mental health of children [3].

Moreover, parental mental health history was a significant positive predictor of children's depression severity, which underscores the mental health atmosphere of the family as critical in determining the child's mental health. This supports the earlier findings by Eadeh et al. [4] on the impact of family factors on depression in children.

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5.2. Limitations

The evaluation tool chosen for this research study was the PHQ-9; in fact, child depressive symptoms were measured with the PHQ-9. A more adult-centered tool, such as the PHQ-9, may not take into consideration child symptoms such as temper tantrums and sleep difficulties, which can affect a child's depressive assessment. Also, the total population involved 73 second-grade students from two public primary school classes in Beijing, and with this population, the sample had a restriction in terms of the level and school in which the dissertation took place. With this constraint in mind, the study results were not generalizable, given the lack of variation in the studied relationship between ADHD and depression in different populations. The research design used in this study was cross-sectional. The cross-sectional study can prove a relationship among variables but not a causal relationship. Further research will be required to prove a causal relationship between ADHD, some parental variables, and depression.

5.3. Implications

Regarding school-based interventions, attention to early identification of symptoms of ADHD and developing relevant interventions is important because schools can apply risk reduction methods in this context through organizing specific psychological counseling sessions and support groups among peers to help children with ADHD. Moreover, in a clinical setting, child-centered assessment application for assessing children with depressive symptoms rather than relying on an adult assessment application is important, and simultaneously, consideration of parents' mental health and providing relevant intervention and guidance is an important course of action when necessary. Furthermore, for parents, it is important to work on improving their own supervision and management of children with ADHD, gaining relevant parenting skills, creating a positive environment at home, being concerned with personal mental health, and considering support in a timely manner in case of personal experience with mental health issues. As far as future studies are concerned, child symptom assessment utilizing standard measurement methods is recommended, and a larger sample size with a broader geographical consideration leaning towards different regions, age, and schools can improve applicability in future research studies, and more longitudinal studies can be conducted concerning causal relationships among variables with considerations of other factors such as family and friendship relationships for a better insight into factors influencing depressive symptoms among children.

6. Conclusion

In this research, the correlation of Attention Deficit Hyperactivity Disorder (ADHD) and depression in children in the seven-to-nine-year-old group is discussed. Additionally, this research will investigate the moderating influence of parenting style and the parents' history of mental health. The results obtained show a significant and very strong positive correlation between symptoms of ADHD and symptoms of depression. The results show a weak moderating factor in the parenting style and child care, and parents' history of mental care affects the child's depression symptoms very significantly. Based on these findings, a basis for the theories concerning ADHD and depressive tendencies in young children is established. Additionally, this research holds significance in educational settings, healthcare institutions, and child-rearing practices. Yet, additional longitudinal studies are required to prove and establish these findings because of the limitations in this research. In this research, the correlation of Attention Deficit Hyperactivity Disorder (ADHD) and depression

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