

Gender Disparity in ADHD Referral and Diagnosis: A Regional Clinic Study (ID 61)

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Introduction

- Attention Deficit Hyperactivity Disorder (ADHD) is prevalent among Australian children with a notable gender imbalance in referral and diagnosis favouring boys¹. A delayed diagnosis of ADHD can have significant consequences that affect various aspects of an individual's life including emotional well-being, academic and occupational performance, social relationships, and overall quality of life¹.
- Through this project, we aim to deepen our understanding of ADHD in girls and explore strategies for facilitating earlier identification and intervention. Our goal is to offer valuable insights that can inform healthcare practices and educational initiatives ultimately ensuring that all children, regardless of their gender or location, receive the support they need to thrive. Promoting early identification and intervention for girls with ADHD can improve resource use in regional and rural Australia and reduce the strain on healthcare services and costs associated with diagnostic delays.

Aim

- The purpose of this study is to delve deeper into gender disparities in ADHD manifestation, pinpoint reasons behind diagnostic delays for girls, and elucidate the consequential ramifications for Australia's regional and rural communities, where ADHD and gender-related research remains sparse.

Methods

- This was a **retrospective cross-sectional study** of paediatric patients [n=171] who attended an outpatient regional hospital in NSW in 2021, had a formal diagnosis of ADHD, and were prescribed an ADHD-related medication. A detailed subset analysis was performed on 20 [n=10 females, n= 10 males] randomly selected individuals.

Step 1	Step 2	Step 3
Prescription pads from year 2021 with prescriptions for ADHD-medications (stimulant and non-stimulant) were used for collection of data.	Name, DOB, and gender was written from prescription pads. This information was then utilised to collect MRNs.	With the MRNs, data was collected for a total of 171 participants from electronic medical records. Subset detailed data was collected for 20 (10F, 10M) randomly selected participants.

- Data collected:** Data collected included demographics, details of ADHD diagnosis, details regarding referral process, and details regarding diagnostic process.
- Statistical analysis:** All data analyses were performed using JAMOV1 software with alpha levels set at $p < .05$. Data on the various variables, such as age at diagnosis, referral patterns, diagnostic delays, and the utilization of screening tools were analysed using descriptive statistics, and statistical tests, such as chi-squared tests or t-tests, were employed to identify significant differences and patterns in the data.

Results

Diagnosis of ADHD in Males versus Females (n=171) (see Fig. 1 and Fig. 2.):

- 171 patients with ADHD were seen in clinic in 2021. Females were more commonly diagnosed with inattentive type of ADHD and later compared to males. Results written in brackets are expressed as percentage unless stated otherwise.

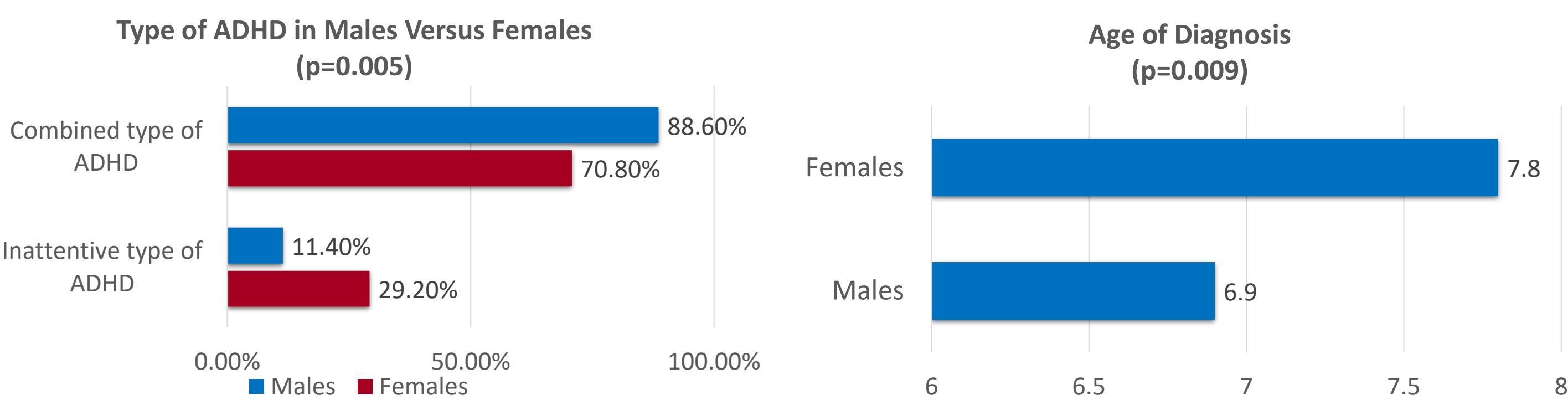


Fig. 1: ADHD diagnoses in males versus females in 2021, (n=171).
Fig. 2: Mean age of diagnosis in females versus males in 2021, (n=171)

Referral Process:

- Prior to the paediatrician appointment, boys were more likely than girls to have hyperactive and externalizing symptoms documented as a reason for concern (n=7 (70%) males, n=3 (30%) females, $p=0.074$), while girls were more likely than boys to have emotional problems as a reason for concern (n=6 (60%) females, n=4 (40%) males, $p=0.371$).
- Boys were more likely to have multiple informants express concern compared to girls for both initial concern (n=6 (60%) versus n=3 (30%), $p=0.178$) and concern for ADHD (n=5 (50%) versus n=2 (20%), $p=0.160$). Furthermore, both teachers (n=5 (50%) versus n=4 (40%), $p=0.653$) and parents (n=9 (90%) versus n=7 (70%), $p=0.264$) were less likely to report concern for ADHD in girls versus boys.

Reasons for Diagnostic Delay (see Fig 3.):

- Our results highlighted that, on average, girls had more missed opportunities and less screening tool utilisation for the diagnosis of ADHD compared to boys ($\bar{x}=3.2$ (2.6 SD) versus $\bar{x}=1.2$ (1.7 SD), $p=0.057$). Furthermore, there were more reasons for a delay in diagnosis ($\bar{x}=3.2$ (1.8 SD) versus $\bar{x}=0.8$ (1.0 SD), $p=0.002$), and overall, a higher likelihood of delay in diagnosis (n=8 (80%) versus n=5 (50%), $p=0.160$) in girls versus boys. The most common reason for a delay in diagnosis for girls was due to symptoms being attributed to another condition (e.g., attention and concentration difficulties due to anxiety) (n=7 (70%) versus n=2 (20%), $p=0.025$).

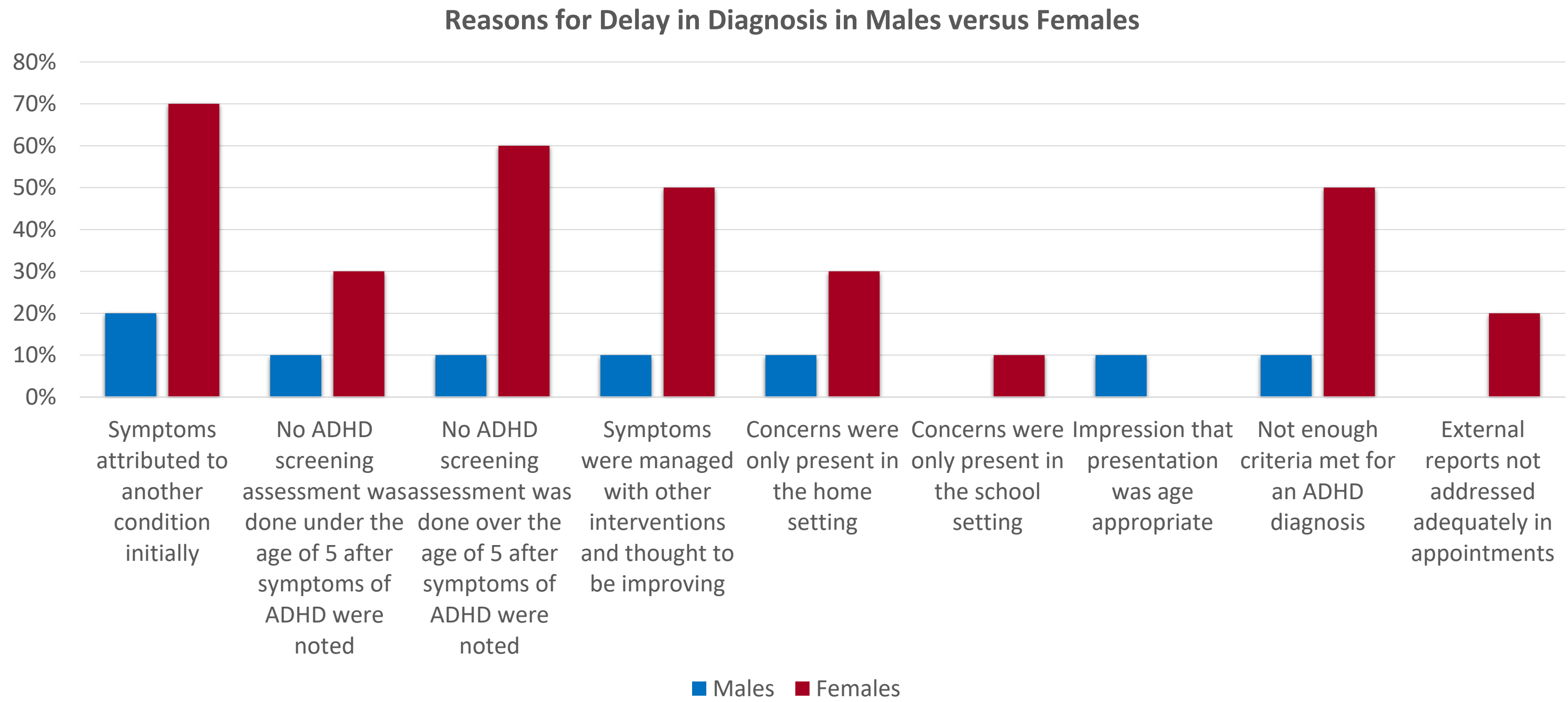


Fig. 3 Reasons for diagnostic delay in males versus females diagnosed with ADHD.

Time Taken for Diagnosis:

- Girls required more paediatrician appointments after concern of ADHD was established to reach a diagnosis compared to boys ($\bar{x}=4.4$ (2.6 SD) versus $\bar{x}=2.5$ (1.8 SD), $p=0.077$).
- Girls, on average, took longer than boys to be diagnosed with ADHD after the first concern for ADHD was established ($\bar{x}=24.4$ (19.7 SD) months versus $\bar{x}=18.3$ (15.4 SD) months, $p=0.451$).

Discussion

- In line with other studies, our findings indicate that girls were diagnosed later than boys ($\bar{x}=6.9$ (2.1 SD) years versus $\bar{x}=7.8$ (2.5 SD) years, $p=0.009$) and more susceptible to misdiagnosis (n=7 (70%) versus n=2 (20%), $p=0.025$)^{1,2}. **Figure 4** highlights the multifactorial relationship between factors that perpetuates this delay.
- Our findings highlighted the influence of referral bias to diagnostic delay in girls with ADHD. Girls were more likely than boys to be diagnosed with inattentive type of ADHD (n=14 (29.2%) versus n=14 (11.4%), $p=0.005$). Overall children who received a diagnosis were more likely to have combined type of ADHD (n=143 (83.6%), $p=0.005$) which often presents with more overt symptoms to the referrer (parents and teachers).
- Delayed ADHD diagnosis often results in higher rates of comorbidities and increased healthcare use, leading to greater overall costs¹. In regional and rural Australia, where resources and specialists are scarce, this strain exacerbates existing healthcare challenges and increases costs³. Early diagnosis and intervention can help reduce these pressures and improve outcomes¹.
- By improving knowledge of primary informants (parents and teachers) about how ADHD presents in girls, utilising screening tools to streamline the diagnostic process, and giving special consideration surrounding the possibility of ADHD as a diagnosis in girls, we may improve diagnoses rates.

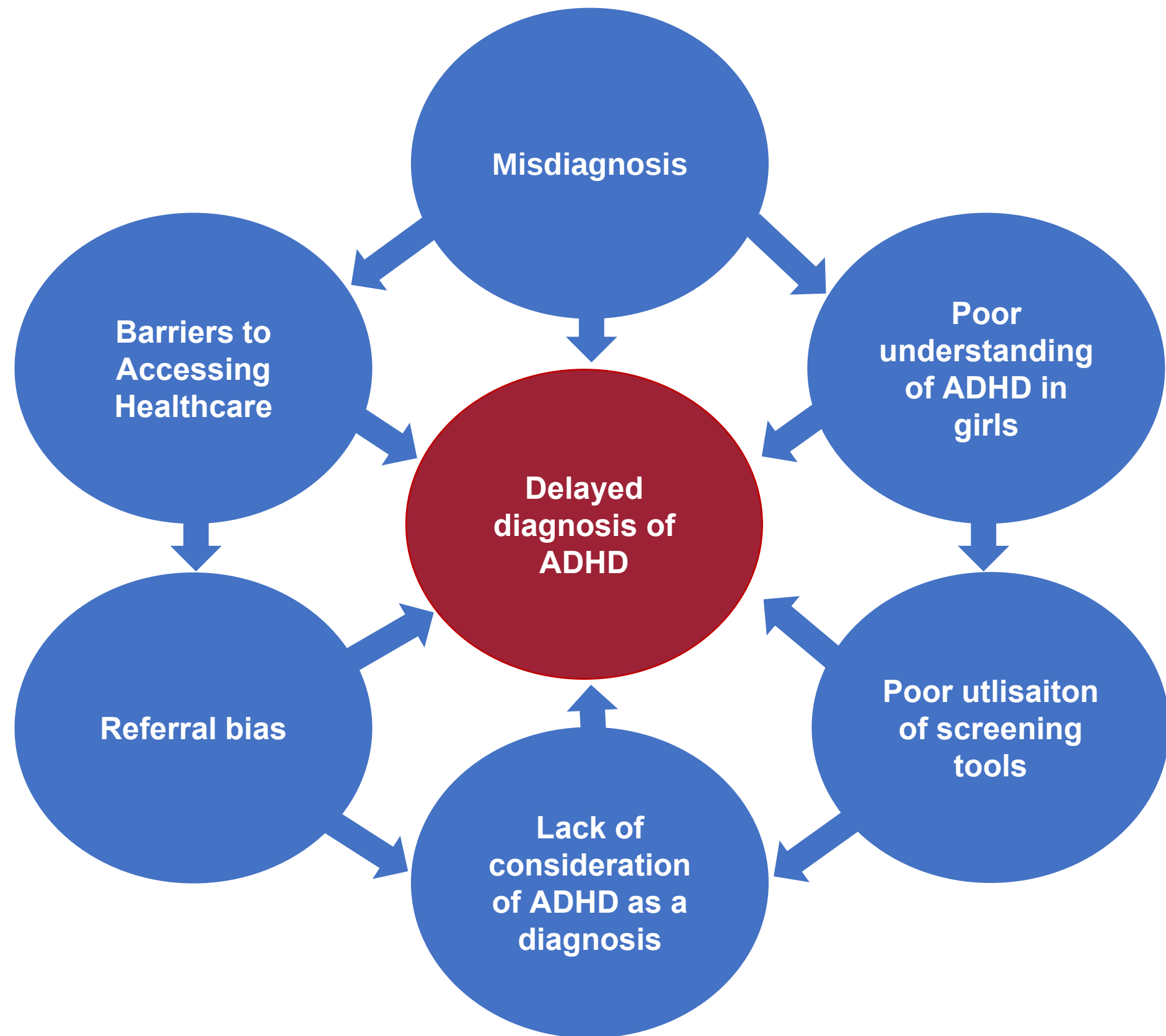


Fig. 4 Multifaceted relationship of factors that delay diagnosis of ADHD, especially in girls

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