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# Integrative literature review – the impact of ADHD across women's lifespan

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## Abstract

**Background** Attention-Deficit/Hyperactivity Disorder (ADHD) and associated comorbidities in women are poorly recognised and often late diagnosed or misdiagnosed. This has significant negative impacts on the health and wellbeing of girls and women across their lifespan.

**Aim** This integrative literature review aims to synthesize existing studies on the impacts of ADHD and associated comorbidities, as well as the challenges of delayed diagnosis and misdiagnosis for women and girls, focussing on critical life stages such as adolescence, perinatal, postnatal and (peri)menopause. Additionally, this review aims to identify evidence-based strategies for improving diagnosis, treatment, and support for this vulnerable population.

**Methods** An integrative literature review was conducted using Whittemore and Knafl's framework. Searches were performed in Embase, Cumulative Index for Nursing and Allied Health Literature (CINAHL), PubMed, National Library of Medicine (Medline), Scopus and Google Scholar (March - April 2025). Studies were selected based on defined inclusion and exclusion criteria, focussing on women and girls diagnosed with ADHD and their experience regarding diagnosis, comorbidities and treatment outcomes, were peer-reviewed, and published in English. Data was managed in Covidence and appraised using MMAT and AGREE II.

**Results** The review identified and included ten studies (five qualitative, four cohort, one mixed-methods) and one guideline, published between January 2023 - April 2025, revealing five key developmental domains: Childhood and adolescence - late diagnosis and early comorbidities, Adulthood - hormonal impacts and comorbidities, Perinatal period - outcomes and challenges, Menopause and later life - hormonal transitions and late diagnosis, Cross-developmental treatment considerations - evidence gaps and women-specific approaches. Girls and women with ADHD frequently experience delayed diagnosis, leading to heightened risk of anxiety, depression and maladaptive coping strategies. Hormonal fluctuations were found to exacerbate ADHD symptoms, particularly during critical developmental phases such as puberty, the perinatal period, menopause and later life. Highlighting the need for tailored assessment, treatment and care approaches.

**Conclusion** The findings highlight the urgent need to improve awareness of specific ADHD presentations in women and girls and better training for healthcare providers, aiming for earlier diagnosis and comprehensive individualised, tailored treatment strategies. Future research should focus on understanding the interplay between ADHD and its comorbidities, as well as exploring sex specific treatment options to improve health outcomes for women with ADHD.

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## Background

ADHD is a neurodevelopmental disorder characterised by inattention, hyperactivity, and impulsivity. Diagnosis is based on criteria outlined in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), and roughly characterised into ADHD-inattentive, hyperactive-impulsive or combined presentation. According to the criteria, symptoms must have been evident before the age of 12 [1]. Historically, ADHD has been regarded as a childhood condition, predominantly affecting boys. Consequently, diagnostic criteria have been developed primarily based on studies with boys, resulting in diagnostic bias contributing to misdiagnosis or delayed diagnosis in girls [2]. Boys commonly present with more obvious and disruptive hyperactivity and impulsive behaviours. These behaviours align with traditional perceptions of ADHD, prompting educators and parents to seek assessment and diagnosis for boys. In comparison, girls commonly present with less obvious symptoms of inattention. Both gender stereotypes and societal expectation and conditioning, contribute to masking behaviours in girls. This results in underdiagnosis of ADHD, with women typically receiving a diagnosis later in life than men [3].

Failure to recognise ADHD in girls has significant negative impacts. For example, executive functioning difficulties, emotional dysregulation, and rejection sensitivity dysphoria affect relationships, as well as academic and work achievements. These challenges can result in the development of low self-esteem, depression, and anxiety, related to the trauma of persistent negative feedback and failure to meet societal expectations [4–6]. Adolescent girls with undiagnosed ADHD are therefore highly vulnerable. Girls are more likely to experience bullying, engage in self-harming or suicidal behaviour, and develop maladaptive coping strategies, such as disordered eating or substance abuse [2, 7]. Additionally, the impulsivity associated with ADHD, along with heightened rejection sensitivity, increases the likelihood of seeking validation through risky sexual behaviours [8]. This can lead to a higher incidence of unplanned early pregnancy [9, 10]. Hormonal fluctuations during crucial developmental phases, such as puberty, the perinatal, postnatal, and menopausal periods, further exacerbate ADHD symptoms in girls and women [9, 11]. Consequently, women with ADHD face a heightened risk of developing other psychiatric comorbidities, including depression and anxiety. This can lead to misdiagnosis and treatment for these disorders before individuals are identified as having ADHD [9, 12].

Links between ADHD and other neurodivergent spectrum disorders, such as autism, developmental coordination disorder (DCD) [13, 14], connective tissue disorder, such as Hypermobile Ehlers-Danlos syndrome (hEDS), have been recognised [15, 16]. Despite this, understanding how comorbidities may contribute to the detrimental health and wellbeing outcomes for women with ADHD remains limited. For example, women with ADHD have an increased risk of experiencing perinatal and obstetric complications [10, 17], but there is little recognition of the confounding impacts of comorbid conditions such as hEDS [18].

Although emerging research has begun to address gender bias in ADHD recognition and diagnosis, significant gaps remain in understanding the complex interplay between ADHD and co-occurring neurodevelopmental and connective tissue disorders in girls and women. Little is known about how these co-morbidities influence the physical and mental health outcomes of girls and women across different life stages. Addressing this gap is essential to inform gender-sensitive diagnostic criteria, enhance health professional education, and guide the development of holistic care pathways that ultimately improve outcomes for women with ADHD and their children.

### Aim

An integrative literature review was conducted to determine the current evidence on the impact of ADHD and associated comorbidities on girls and women, as well as challenges of delayed diagnosis and misdiagnosis with focus on critical periods, such as adolescence, perinatal, postnatal and (peri) menopause to improve health professionals' understanding of the gender specific presentations and the difficulties women face at various stages of their lives. Additionally, this review aims to identify evidence-based strategies for improving diagnosis, treatment, and support to provide better care to this vulnerable population.

## Methods

An Integrative review facilitates the examination of a wider array of studies and methodologies within a certain field, thereby fostering a deeper understanding of a phenomenon or health care issue [19]. Considering the complexity of the phenomena that are reviewed here, Whittemore and Knafl's (2005) five-stage integrative literature review framework (problem identification, literature search, literature evaluation, analysis of selected studies to identify themes and patterns and presentation of findings) provided the ideal guide to develop rigorous

evidence-based insights and recommendations for practice. Since the phenomenon encompasses both qualitative and quantitative research dimensions, both PICOT (Population, Intervention, Comparison, Outcomes and Time) and PICo (Population, Phenomenon of Interest and Context) [20] frameworks were used to develop a systematic research statement. This approach helps in clearly articulating the research problem, purpose, and design of this review (Table 1).

### Literature search

A literature search was conducted between March and April 2025 across the following databases: Embase, Cumulative Index for Nursing and Allied Health Literature (CINAHL), PubMed, National Library of Medicine (MEDLINE), and Scopus. A supplementary search was performed in Google Schoolar to identify studies not indexed elsewhere. Due to its relevance-based ranking and limited filtering options, only the first 100 results were screened. Screening beyond this point was unlikely to yield additional relevant studies. Title screening identified 66 articles for inclusion in Covidence.

The inclusion period (January 2023-April 2025) was deliberately chosen to capture the most recent and rapidly emerging evidence in the evolving field of ADHD in girls and women. In recent years, research into gender-specific ADHD presentation has increased significantly, and newer studies have begun to explore the relationship between ADHD and comorbid disorders in women. Restricting the timeframe to this period enabled a focused synthesis of contemporary evidence whilst maintaining feasibility and analytical depth. This review therefore aims to connect and interpret the latest findings on women-specific ADHD and associated comorbidities, rather than to summarise all historical literature.

Table 1 shows all inclusion and exclusion criteria, as well as the PICOT and PICo frameworks used to develop the search terms, using Boolean operators and truncation. The following search terms were used: "ADHD" OR "Attention Deficit Hyperactivity Disorder" OR "ADD" AND "women" OR "female" AND "comorbidities" OR "co-morbid*" OR "health outcomes" OR "mental health" OR "physical health" OR "wellbeing" OR "quality of life" OR "obstetric" OR "perinatal" OR "postnatal" AND "adolescence" OR adulthood" OR "perimenopause" OR "menopause" OR "lifespan" AND "impact*" OR "outcome*" OR "implication*" OR "assessment" OR "diagnosis" OR "late diagnosis" OR "misdiagnosis" OR "treatment".

**Table 1** Inclusion and exclusion criteria used for this review

| | |
|---|---|
| Inclusion criteria | Articles published: January 2023- April 2025<br>Population: females diagnosed with ADHD (girls, adolescents, and women)<br>Phenomenon of interest: experiences and perceptions of diagnosis, misdiagnosis, and comorbidities<br>Comparison: population with ADHD vs. without ADHD or females with ADHD vs. males with ADHD<br>Outcomes/Context/Time: mental health, physical health, wellbeing, quality of life, diagnosis, treatment<br>Study types: Peer-reviewed, qualitative, quantitative, mixed-method primary research studies<br>Language: English |
| Exclusion criteria | Studies with focus on males, non-ADHD neurodevelopmental disorders, opinion pieces, editorials, conference abstracts, reviews |

### Data management

#### *Evaluation*

To ensure transparent data management and reproducibility, Covidence[1] was employed to guide systematic study selection. This included duplication removal, title and abstract screening, selection of studies for full-text screening, and data extraction, using a customized extraction approach guided by the review's inclusion and exclusion criteria. The study selection process was documented using the Covidence PRISMA flow chart (Fig. 1).

Articles were included if they were qualitative, quantitative, or mixed-method primary studies, published in English between January 2023 and April 2025, peer-reviewed, and focused on females with ADHD as the primary diagnosis.

The search yielded $n = 672$ results. All retrieved references were imported into Covidence, 96 duplicates were removed, 576 titles were title-screened, and 557 studies did not meet the inclusion criteria and were therefore removed. The abstracts of the 19 remaining studies were reviewed, and 8 studies did not meet the inclusion criteria and were therefore removed.

#### *Data analysis*

Followed Whittemore and Knafl's (2005) integrative review framework which supports the inclusion and synthesis of empirical and theoretical literature from diverse methodologies.

After a full text review of the remaining 11 studies, 10 met the inclusion criteria. One study [9] was an expert review and guideline and therefore did not strictly meet the inclusion criteria excluding reviews, it was retained due to its methodological rigor, clinical relevance and alignment with the aims of this review. The guideline provided an evidence-based synthesis, developed through expert consensus, and met all. Appraisal of Guidelines for Research and Evaluation (AGREE II) quality criteria [21].

Its inclusion was considered justified because it complemented the primary research by offering context for current clinical practice. The expert review was

[1] Covidence systematic review software, Veritas Health Innovation, Melbourne, Australia. Available at: https://www.covidence.org.

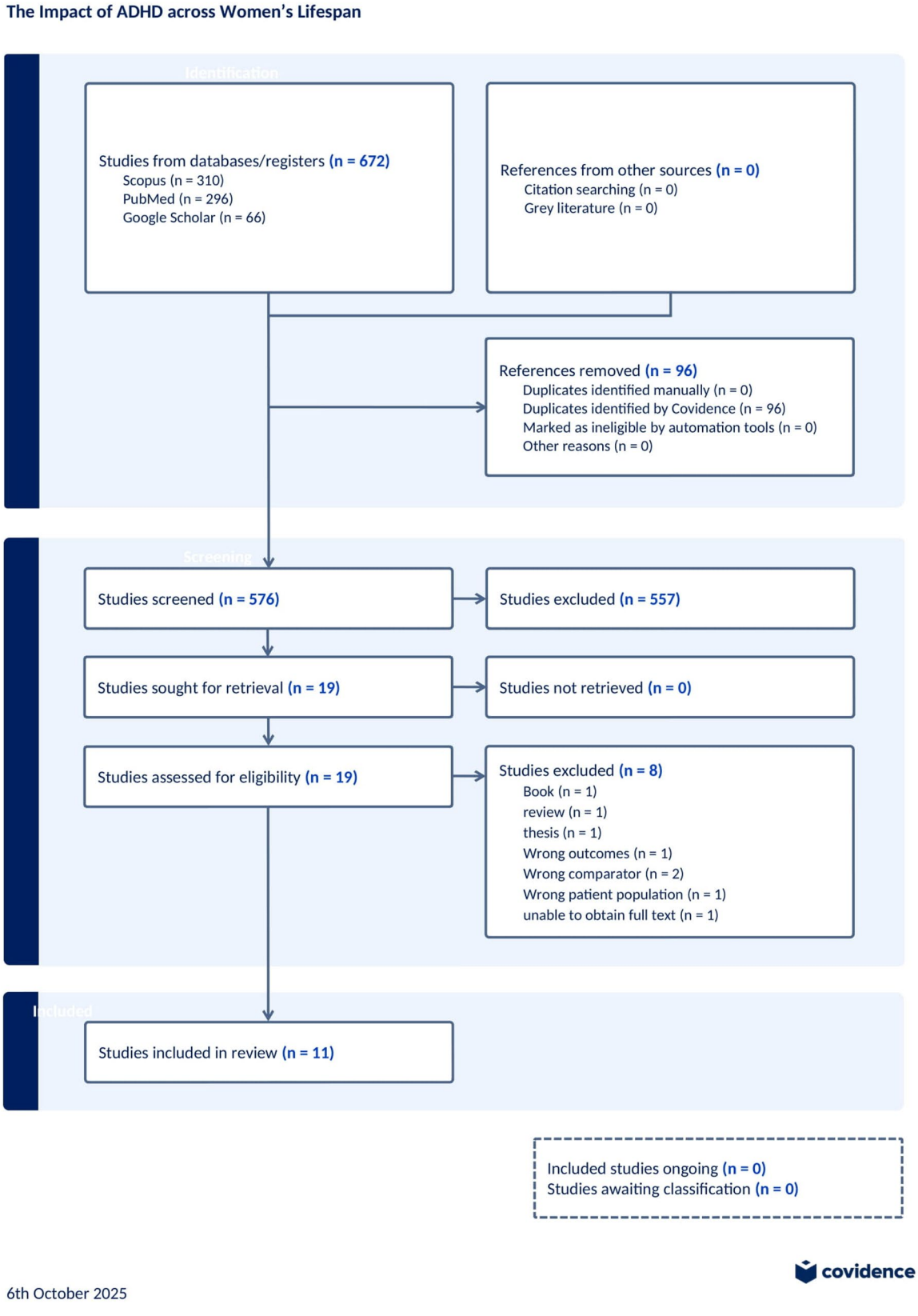


**Fig. 1** Prisma flow diagram illustrating the study selection process for the integrative review

integrated cautiously to minimise bias by treating it as supplementary evidence to support interpretation, rather than as part of the core analysis. The inclusion of a high-quality guideline provides a valuable starting point for future research and development of evidence informed clinical care and treatment pathways for girls and women with ADHD.

The 10 primary studies were evaluated using the Mixed Methods Appraisal Tool (MMAT) [22] and deemed to meet the MMAT quality criteria. All papers were systematically reviewed, and the data were extracted and synthetised (Table 2).

## Findings

### *Study characteristics*

Ten articles, all published between January 2023 and April 2025, met the inclusion criteria: five qualitative studies with sample sizes between 6 and 52 women [25–28, 30], four quantitative non-randomized population-based cohort studies, with study periods between 6 and 10 years and sample sizes between 426,629 and 16,759,786 participants [23, 29, 32, 33], and one mixed-method study including 14 women [24]. Additionally, one expert review/guideline (involving eight experts) was included [31]. Three studies were conducted in the United States of America, two each in the United Kingdom, the Netherlands, and Sweden. The expert review/guideline was conducted/published in Canada.

### *Data synthesis and domain development*

Consistent with Whittemore and Knafl's (2005) framework for integrative reviews, data from all included studies were systematically extracted, reduced, and compared to identify patterns and areas of focus. Given the diversity of study designs, a deductive categorisation approach was used rather than inductive thematic analysis [34]. Findings were organised into life stage domains. This approach provides a developmental structure and highlights how challenges can both accumulate and change with time.

Findings were organised into five life-stage domains, Childhood and Adolescence - Late Diagnosis and Early Comorbidities, Adulthood - Hormonal Impacts and Psychosocial Implications, Perinatal Period - Perinatal Outcomes and Challenges, Menopause - Hormonal Transitions and Late Diagnosis Experiences, and Cross-Developmental Treatment Considerations - Evidence Gaps and Female-Specific Approaches, reflecting both developmental stages, recurrent patterns and areas of focus.

**Domain 1: childhood and adolescence - late diagnosis and early comorbidities** Late diagnosis was a consistent finding across studies [24, 30, 32]. A Swedish population-based cross-sectional study [32] analysed data from the Regional Healthcare Warehouse Stockholm region, over a period of 10 years and found that women received their ADHD diagnosis approximately four years later than males. Additionally, women exhibited significantly higher rates of psychiatric comorbidity and pharmacological treatment for these disorders, both before and after ADHD index, highlighting possible sex bias in assessment and treatment [32].

These findings were supported by one mixed-method and one qualitative study [24, 30], which included 14 women in America and 52 women in England. Despite contact with mental health services since adolescence, these women were not diagnosed until mid-late adulthood. Participants reported significant social challenges since adolescence, including low self-esteem, anxiety, depression, and maladaptive coping strategies such as drinking, self-harming, and disordered eating.

Comorbidities often emerged during adolescence [27, 30, 32], contributing to cumulative psychosocial challenges including low-self-esteem and maladaptive coping. Early misdiagnosis and ineffective treatment were common patterns, delaying appropriate interventions. Thus, this domain highlights the critical need for earlier identification and gender sensitive screening in childhood and adolescence.

**Domain 2: adulthood - hormonal impacts and comorbidities** Adulthood is a period of complex hormonal and psychosocial interaction. Women reported ADHD symptom fluctuations across menstrual cycles, with premenstrual symptom exacerbation [25–28]. These changes affect emotional regulation, organisational ability and daily functioning.

A Swedish qualitative study explored the experiences of 10 women with ADHD diagnosis, who reported menstrual cycle related fluctuations of their ADHD symptoms [25]. Despite the small sample size, the semi-structured, in-depth interviews and thematic analysis provided valuable insights. All women reported an overall positive effect of using stimulant ADHD medication, although effectiveness varied throughout their cycle, with heightened ADHD symptoms during the mid-luteal phase. Most women hesitated to discuss these fluctuations with their prescriber. Additionally, their struggles with planning, remembering, and organisation, negatively affected their menstrual health management. Similar experiences of hormonal menstrual-cycle related ADHD symptom fluctuations were reported in two Dutch studies [27, 28].

The Swedish qualitative non-randomised controlled cohort study including women from 15 to 24 years of age [29] reported that women with ADHD had a threefold higher risk of developing depression, regardless of hormonal contraceptive use, compared to those without

**Table 2** Characteristics and key findings of included studies

| Author/ Year Country | Design Method Strategy | Aim | Population | Findings | Limitations | Strength/ Quality appraisal MMAT |
|---|---|---|---|---|---|---|
| Amikam et al. (2024) USA [23] | Retrospective population-based cohort study (2004–2014)<br>Data collection: Healthcare cost and utilisation Database<br>Logistic regression (adjusted) analysis | Comparison between perinatal outcomes of women with and without ADHD | 9,096,788 women | ADHD diagnosis rate increased over study period.<br>Women with ADHD (10,031) more likely:<br>• younger than 25<br>• White/wealthier<br>• Smoke tobacco<br>• Use illicit drugs<br>Maternal outcomes:<br>Adjusting for confounders<br>ADHD group $p < .001$ = higher rate hypertensive disorders of pregnancy, caesarean section, chorioamnionitis, maternal infection, wound complications.<br>Neonatal outcomes:<br>ADHD group: higher rates small for gestational age and congenital anomalies. | No data available on medication treatment of ADHD, alcohol use, coexisting mental health conditions during pregnancy | Robust database/ representative sample/study length<br>wide range of outcomes assessed<br>Logistic regression analysis<br>All quality criteria met for 3. Quantitative Non-randomized Studies<br>3.1–3.5 |
| Babinsky et al. (2025) USA [24] | Mixed-method investigation<br>Purposeful sampling-social media<br>**Teams focus group 2 × 2 h**<br>Semi-structured format<br>. | Understanding women's experience of late ADHD diagnosis | 14 women | Barriers:<br>Gender-related stereotyping, lack of provider awareness<br>Diagnosis:<br>64% reported receiving ADHD diagnosis as life-changing,<br>Lack off treatment options/ therapy<br>Recommendations:<br>Provider awareness<br>Routine screening in primary care<br>Access to Cognitive Behavioural Therapy neurodiversity-affirming care<br>Peer support | Small sample predominantly white<br>Possible self-selection bias.<br>Focus group teams-recording, response-influence | qualitative/quantitative data<br>All quality criteria met for 5. Mixed method studies<br>5.1–5.5 |
| Bürger (2024) Sweden [25] | Qualitative research<br>Purposeful sampling, social media, menstrual health/ADHD groups<br>Individual virtual-Semi structured interviews | Understanding fluctuating ADHD symptoms during the menstrual cycle. | 10 women | ADHD symptoms mid-luteal phase:<br>↑ emotional/attention dysregulation<br>Negative impacts on relationships, career, mental health<br>Providers lacking knowledge regarding hormonal impact on medication. | Small sample<br>Possible recruitment bias.<br>Sample diversity ↓generalizability. | reflexive thematic analysis<br>All quality criteria met for 1. Qualitative studies<br>1.1–1.5 |

**Table 2** (continued)

| Author/ Year Country | Design Method Strategy | Aim | Population | Findings | Limitations | Strength/ Quality appraisal MMAT |
|---|---|---|---|---|---|---|
| Craddock (2024) UK [26] | Interpretative phenomenological analysis, semi-structured email interviews Purposive sampling | Understanding the experience of adult diagnosis for women with combined Attention-Deficit/ Hyperactivity Disorder and Autism (AuDHD) | Six Women with AuDHD | Co-occurring Autism ↑ trait overlap<br>↑masking + gender bias = ↑risk of miss-diagnosis<br>20–50% of women with ADHD also have ASD = AuDHD<br>↑risk of trauma, sexual abuse<br>↑maladaptive coping strategies<br>↑risk of mothering difficulties + ↑ neurodivergent offspring<br>Hormonal influences, ↑ struggle in (peri)menopause | Small all white sample<br>Potential researcher bias | Neurodiversity-affirming approach, good sociodemographic spread = rich qualitative data.<br>Reflexive journalling, member checking, ↑ credibility/ trustworthiness.<br>All quality criteria met for 1. Qualitative studies 1.1–1.5 |
| De Jong et al. (2024) Netherlands [27] | Qualitative<br>Recruitment: existing clinic patients<br>Group program, three consecutive groups. | Determining if female-specific psychoeducation in a group setting improves women's experience of premenstrual mood fluctuations and ADHD symptoms | 18 women diagnosed with ADHD and premenstrual worsening of ADHD symptoms in adulthood<br>Evaluation of third group (6 women). | Pre-intervention: unaware of menstrual cycle<br>• Experiencing pre-menstrual worsening ADHD symptoms<br>• Maladaptive coping (binge-eating)<br>Post-intervention:<br>• ↑ understanding of cycle.<br>• ↑ self-compassion<br>• ↑ adopt healthier coping strategies – awareness of needs<br>• Plan work/selfcare<br>↓ binge-eating. | Small sample size<br>No standardized measurements collected before/after intervention.<br>**Evaluation session**: Not anonymous/short, possible bias/influence | Innovative and cost effective.<br>Baseline for future research.<br>Quality criteria met for 1. Qualitative studies 1.1, 1.3<br>Not met for 1.2, 1.4, 1.5 |
| De Jong et al. (2023) Netherlands [28] | Qualitative community case study | Determining if increasing stimulant medication doses during the premenstrual week improve affected women's ADHD and mood symptoms | 9 women with ADHD diagnosis (6 women also had premenstrual dysphoric disorder (PMDD)) . | Premenstrual experience before stimulant medication change:<br>• ↓ focus<br>• ↓ concentration<br>• ↓ productivity<br>• ↑ "Brain-fog"<br>• ↓ self-control→<br>↑ heated arguments<br>↑ Binge-eating<br>↑ impulsive behaviours<br>↑ feeling of guilt and shame<br>After personalized premenstrual increased stimulant dosing:<br>• Women's premenstrual dysphoric and ADHD symptoms improved.<br>• ↓ Mood swings<br>• ↓ irritability & anxiety<br>• "Less reactive"<br>• "More in control" | Very small study sample, no control group, limits generalizability.<br>Variables: Depression/PMDD could influence outcomes.<br>5-point Likert scale, introduced late | Innovative female specific, menstrual cycle-based treatment.<br>Real world clinical setting using consecutive patients<br>Length of regular follow up: 6–24 months.<br>Quality criteria met for 1. Qualitative studies 1.1–1.2 yes<br>1.3 can't tell<br>1.4–1.5 yes |

**Table 2** (continued)

| Author/ Year Country | Design Method Strategy | Aim | Population | Findings | Limitations | Strength/ Quality appraisal MMAT |
|---|---|---|---|---|---|---|
| Lundin (2023) Sweden [29] | Cohort study<br>Identified through Swedish national population-based registers | Determining if young women with ADHD are at increased risk of depression when using hormonal contraception | 763,146 Swedish women without ADHD diagnosis, 29,767 Swedish women with ADHD diagnosis | • ADHD/Combined oral contraceptive $P<.001$<br>• ADHD/Progesterone only $P<.001$<br>• ADHD/Patch, ADHD/vaginal ring P 0.14 AHD/Implant P 0.91 ADHD/Injection P 0.12 ADHD/hormonal IUD P 0.06<br>Women with ADHD 3x higher risk of depression than women without ADHD, regardless of Hormonal Contraception (HC)<br>Women with ADHD, six times increase in risk of depression compared to women without ADHD, who used HCP | Women with ADHD identified based on prescribed stimulant medication.<br>Results may represent more severe ADHD<br>Depression identified through prescription of antidepressants, (not exclusively prescribed for depression) affecting reliability. | Co-variables identified<br>Quality criteria met for 3.<br>Quantitative Non-randomized studies<br>3.1–3.4 yes<br>3.5 can't tell |
| Morgan (2024) UK [30] | Narrative qualitative interviews<br>Recruitment: email flyer sent to university student's<br>Semi-structured Interviews, Microsoft Teams:<br>Thematic analysis | Understanding how late diagnosis impacts women with ADHD. | 52 women with adult ADHD diagnosis (psychiatrist) | Impact of late diagnosis: Trauma, bullying, ↓ social relationships, ↓self-esteem, ↑ maladaptive coping: substance abuse, disordered eating, self-harm<br>↑ anxiety & depression<br>Barriers to diagnosis – gender stereotypes, poor professional awareness, wait time, cost<br>After Diagnosis:<br>• Relief/<br>• Stimulant medication, ↓need for antidepressants<br>• Lack of support/therapy options | possible self-selection bias<br>More privileged socioeconomic demographic<br>Ethnicity predominantly white<br>Sample lacks diversity, reducing generalizability<br>Limited generalizability | Good sample size<br>Underexplored population<br>Rich data collection<br>Comprehensive thematic analysis<br>All Quality criteria met for 1. Qualitative studies 1.1–1.5 |
| Scoten et al. (2024) Canada [31] | Expert review/ guideline | Reviewing evidence-developed ADHD perinatal care guidelines | Eight experts | Comprehensive review of ADHD in the perinatal period and guideline.<br>Table 1:<br>Diagnostic criteria for ADHD<br>Table 2:<br>Guideline, pre-conception counselling, perinatal planning- management/ support.<br>Table 3:<br>Evidence regarding medications for treatment of ADHD during perinatal period. | Limited research of ADHD in perinatal period and long-term outcomes of ADHD medication during pregnancy and breastfeeding available, other evidence, not generalizable to pregnant population. | Recommendation to conduct further research to improve evidence base.<br>MMAT not applicable<br>AGREE II Quality criteria met for scope, clarity, practical applicability, stakeholder involvement, rigorous methodology, editorial independence |

**Table 2** (continued)

| Author/ Year Country | Design Method Strategy | Aim | Population | Findings | Limitations | Strength/ Quality appraisal MMAT |
|---|---|---|---|---|---|---|
| Skoglund et al. (2024) Sweden [32] | Population based cross-sectional cohort study<br>January 2011-December 2021<br>Data collection: Regional-Healthcare-Data-Warehouse Stockholm | Understanding impact of delayed ADHD diagnosis in female's vs. males. | 85.330 individuals with ADHD diagnosis ($N=37.591$ females)<br>Population control 426,626 individuals | Females:<br>• Older at diagnosis (4-years)<br>• Miss-diagnosed<br>Females' vs. males with ADHD incidence of psychiatric comorbidity diagnosis and psychotropic drug use $P<.001$<br>Recommendations:<br>• ↑ awareness of female ADHD<br>• Further research to explore hormonal impacts on ADHD symptoms. | Potential selection bias<br>No link between specific diagnosis and specific treatments | Large sample size,<br>Population controls.<br>Multiple statistical tests<br>All Quality criteria met for 3.<br>Quantitative non-randomized studies<br>3.1–3.5 |
| Song et al. (2025) USA Japan [33] | Serial cross-sectional study (2016–2020)<br>Healthcare-Cost- Utilisation-Database | Understanding clinical characteristics, maternal morbidity, perinatal outcomes of women with ADHD | 16,759,786 hospital deliveries<br>33,415 women with ADHD diagnosis | • 39.4% increase in diagnosis rate over study period.<br>Characteristics women with ADHD-<br>more likely to be/use/have:<br>• White<br>• Smoke Tobacco<br>• Alcohol or drugs<br>• Asthma<br>Severe maternal morbidity:<br>• Overall similar in both groups.<br>ADHD cohort obstetric outcomes:<br>• ↑ coagulopathy, renal failure<br>• Modest increase of GDM, Hypertensive-disorder, chorioamnionitis, caesarean, preterm delivery | No details available of diagnostic criteria, diagnosis timing (in relation to index pregnancy) or functional impact of ADHD<br>No information on duration and pharmacological treatment, limiting conclusion regarding outcomes | Large sample size, study period.<br>Propensity scoring<br>↑ADHD diagnosis – requires ↑ training of care providers<br>All Quality criteria met for 3.<br>Quantitative non-randomized studies<br>3.1–3.5 |

↑ represents increase*, ↓ represents decrease*

ADHD. Furthermore, ADHD diagnosis alongside combined oral contraceptive use, or progesterone-only oral contraceptive use, was associated with a significantly increased risk of depression.

These findings highlight the importance of considering ADHD, when assessing young women with depression, who use hormonal oral contraceptives, emphasizing the need for informed contraceptive counselling. Long-acting reversible contraceptives, while slightly increasing risk of depression in women with ADHD, are generally more reliable in pregnancy prevention, making them the safer choice for this cohort [29]. Additionally, clinical trials for hormonal contraceptives should include women with ADHD and other psychiatric comorbidities to enhance guidance for providers and consumers.

Comorbid mental health conditions were highly prevalent with all studies reporting higher rates of anxiety, depression and substance use disorder among women diagnosed with ADHD, and some studies also reporting higher rates of disordered eating [27, 30, 32]. These comorbidities were associated with negative impacts on health, mental well-being, educational attainment and socioeconomic status. This raises questions about the interplay between ADHD and other psychiatric conditions, including the risk of misdiagnosis and delayed diagnosis.

One English study [26] examined the experience of six women with co-occurring ADHD and autism (AuDHD), diagnosed in adulthood (34–55 years of age). Although only white women were included, the study provided neurodiversity affirming rich data. It found that overlapping ADHD and autism traits, combined with gender bias and societal expectations, complicated and delayed diagnosis for women, often leading to misdiagnosis of other psychiatric disorders. Participants described increased vulnerability to sexual assault, domestic violence, and challenges with parenting neurodivergent children, contributing to trauma and risk of autistic burnout.

**Domain 3: perinatal period - perinatal outcomes and challenges** Two American quantitative non-randomized population-based cohort studies examined perinatal outcomes for women with ADHD [23, 33]. The first study

analysed data from 9,096,788 women who gave birth from 2004 to 2014, identifying 10,031 women with ADHD diagnosis [23]. Women with ADHD were more likely to be younger than 25, white, wealthier, smoke tobacco, and use illicit drugs. After adjustments, the ADHD group showed a significantly higher rate of hypertensive disorders of pregnancy, caesarean section, chorioamnionitis, maternal infection, and wound complications. Neonatal outcomes showed higher rates of small-for-gestational age and congenital abnormalities for the ADHD cohort. Limitations included lack of data on alcohol or stimulant medication use and co-existing mental health conditions, reducing generalisability.

The second study, involving 16,759,786 women who had hospital deliveries between 2016 and 2020 [33], found a 39.4% increase in ADHD diagnoses and associations with asthma. It noted a slight rise in pre-term and caesarean deliveries among the ADHD cohort. The authors emphasized the need for improved provider training regarding the links between ADHD, asthma, and substance use in perinatal care, as well as longitudinal research about ADHD medication use in pregnancy and the psychosocial impact of treated and untreated ADHD in the perinatal period.

The expert review on ADHD in pregnancy and postpartum care [31] emphasizes the need for providers to recognize that 10% of adults with recurrent depression and anxiety disorders may have ADHD. The review offers clinical guidance on diagnosing and treating ADHD during the perinatal period, urging improved screening, preconception counselling, and individualized treatment planning. Additionally, authors advocate for a holistic approach, combining pharmacotherapy with non-pharmacological options such as psychoeducation and psychotherapy to effectively manage ADHD during this critical time [31].

**Domain 4: menopause and later life- hormonal transitions and late diagnosis** Menopause was identified as key transitional phase for women with ADHD. Hormonal changes often amplified ADHD symptoms, with many women receiving diagnosis late in life. The AuDHD women [26] faced significant challenges related to hormonal fluctuations during key life stages. Years of trauma from being undiagnosed, were associated with physical or psychological symptoms, leading to burnout and a search for diagnosis, commonly during (peri) menopause [26].

Barriers to diagnosis included, lack of community and provider awareness of ADHD presentation in girls and women, ineffective treatment with antidepressants, and practical barriers such as cost, and wait time for assessment [24, 30]. Women expressed that diagnosis was validating but also led to grief over lost opportunities. Whilst stimulant medication improved their executive functioning, the lack of post-diagnosis support left many struggling and seeking psychological help to process trauma beyond medication.

This stage reflects both the cumulative psychosocial impact of long-term undiagnosed ADHD and the importance of considering hormonal transitions in treatment planning.

**Domain 5: cross-developmental treatment considerations - evidence gaps and women- specific approaches** Across all life stages, there was a consistent lack of comprehensive, treatment options tailored to girls and women [24–28, 30]. Six studies [24–28, 30] identified a significant lack of post-diagnosis treatment options, with stimulant medication being the only routine treatment option offered. They emphasized the profound impact of late diagnosis, which was associated with psychological impairment due to years of trauma experiences. Consequently, all qualitative studies advocated for a more holistic treatment approach that includes not only stimulant medication but also counselling, ADHD coaching, or cognitive behavioural therapy.

Two Dutch studies focused on female-specific ADHD treatments and the impacts of hormonal fluctuations across the menstrual cycle [27, 28]. Conducted at the PsychQ clinic in The Hague, one study assessed whether increasing stimulant medication during the premenstrual week improved mood symptoms in nine women with ADHD, six of whom also had premenstrual dysphoric disorder (PMDD) [28]. Despite a small sample size and lack of control groups, the study in a real-world clinical setting provided valuable early insights into innovative menstrual cycle-based treatments for women with ADHD. Prior to the intervention, women reported premenstrual decreases in focus, productivity, and increased impulsivity, which were addressed by individualized stimulant dose increases 3–10 days prior to menstruation. Following the intervention, participants experienced significant reductions in PMDD and ADHD symptoms, including a reduction in mood swings and irritability, feeling "more in control". The outcomes support the need for larger-scale trials to further explore hormonal influences on ADHD symptoms in women.

The second study [27] examined whether female-specific psychoeducation in group settings could improve premenstrual ADHD symptom fluctuations [27]. Eighteen women participated across three treatment groups, with a minimum attendance of five sessions. Although the sample size was small and the feedback non-anonymous, the outcomes highlight a cost-effective treatment approach. Pre-intervention, participants recognized their worsening symptoms but were unaware of how this related to their menstrual cycle. Post-intervention, all

women reported a better understanding of their menstrual cycle, enabling them to adopt effective coping strategies, such as pre-planning to address unhealthy binge eating and scheduling work and self-care around their hormonal needs. This domain highlights the need for more interventions specifically designed for girls and women throughout the lifespan.

## Discussion and recommendations

This integrative review synthesised recent evidence (January 2023-April 2025) on the impact of ADHD across women's lifespan, highlighting critical developmental stages and clinical patterns.

Central to the challenges faced by women with ADHD is delayed diagnosis, which is associated with significant cumulative negative psychosocial impacts [2, 4]. Most studies highlight a lack of provider awareness and knowledge [23–26, 30–32]. Therefore, improving community and provider awareness of the presentation of ADHD and AuDHD in girls and women is essential to facilitate earlier referral, screening and assessment [24, 26, 30–32].

Whilst primary care providers are generally trained to assess and treat depression and anxiety, they commonly lack in knowledge and confidence to screen for or manage ADHD. This can contribute to misdiagnosis, ineffective treatment [24, 26, 30, 32], and further psychosocial difficulties, including maladaptive coping strategies, such as substance abuse, disordered eating, and self-harm [24, 26, 30]. To address these issues, primary care providers should receive training and clinical guidance on administering ADHD and AuDHD screening alongside anxiety and depression [3, 24, 26, 30–32], with appropriate referral pathways for further evaluation.

Post-diagnosis treatment should adopt a holistic multimodal approach, offering pharmacological treatment alongside psychotherapy, psychoeducation, ADHD coaching and peer support, according to their individual needs [2, 24–28, 30–32]. The overrepresentation of predominantly white and higher socioeconomic status participants in most studies highlights the need for research and interventions that address barriers to diagnosis and care for underrepresented populations.

Given the impact of hormonal fluctuations on ADHD symptoms throughout women's lifespan, future research should explore treatment options tailored to girls and women's needs, such as menstrual cycle education groups and individualized stimulant medication prescription [27, 28]. Furthermore, there is a lack of research examining comorbidities beyond co-occurrence of ADHD and autism. Considering the prevalence of conditions such as developmental coordination disorder (DCD) [13–15], hypermobile Ehlers-Danlos syndrome (hEDS) [15, 16], and postural orthostatic tachycardia syndrome (POTS) [35], further investigation into how these comorbidities impact women with ADHD is warranted. This research could inform more comprehensive assessment, intervention and support strategies.

However, it is important to note that only ten primary studies were included in this review. While the findings are significant, the limited size and scope of the evidence base reduce the generalisability of conclusions. Future research should aim to broaden and deepen the evidence base to strengthen the validity of recommendations and ensure they are applicable across diverse populations and contexts.

### Strengths and limitations

Key strengths include the use of systematic, transparent integrative review methodology, rigorous critical appraisal through MMAT and AGREE II tools and the inclusion of geographical and methodological diverse studies, which strengthen the applicability, currency and relevance of the findings.

However, several limitations must be acknowledged. Only ten primary studies met the inclusion criteria, reflecting the limited but emerging nature of research in this field. Therefore, the findings and conclusions should be interpreted with caution. Restricting the timeframe to recent publications may have excluded earlier foundational research which could limit historical context. Nevertheless, this narrow scope was intentional, allowing the review to focus on the most recent developments in women-specific ADHD research and the growing recognition of associated comorbidities. Undertaking an integrative review at this stage was therefore considered both necessary and timely to consolidate emerging evidence, identify knowledge gaps and guide future research priorities.

The breadth in geographical area, methodologies and contexts reviewed may have limited depth in specialized areas, highlighting an inherent trade-off in integrative reviews.

The first author's lived experience of a late ADHD diagnosis and extensive professional background in primary health and maternity care represents both a strength and limitation. Enriching the interpretation of data, by providing contextual understanding of both clinical and personal relevance of findings. At the same time, it may have introduced bias in the interpretation of evidence. To mitigate this, the review adhered closely to a structured methodology, to ensure transparency. Despite these limitations, this integrative review provides a timely synthesis of the latest research and establishes a strong foundation for future studies to build upon.

## Conclusion

This integrative literature review identifies key issues affecting women with ADHD throughout their lifespan. The findings emphasise the prevalence of late diagnosis, elevated risk of comorbid mental health conditions, the influence of hormonal fluctuations on symptom presentation and perinatal challenges. Women continue to face significant barriers to diagnosis and treatment, including gender bias, limited provider knowledge, and lack of specific interventions tailored to the hormonal fluctuations girls and women experience throughout their lifespan, highlighting the need for timely assessment, diagnosis, and evidence-based treatment.

While pharmacotherapeutic interventions remain the principal approach to treatment, evidence suggests that holistic, individualized approaches, including psychoeducation, peer support, ADHD coaching and cycle-specific interventions, may improve outcomes.

The review also identifies important gaps in research, particularly regarding comorbidities and hormonal influences on ADHD symptoms, and interventions tailored to diverse populations. These findings emphasise the need for improved awareness of ADHD presentation in girls and women among healthcare providers, early and accurate diagnosis, and development of evidence-based, women-specific treatment strategies.

Historical male bias in ADHD research and clinical practise has contributed to substantial unmet needs and cumulative negative impacts for women. Future research should prioritize approaches focussed on girls and women, diverse populations, and interventions that address both neurodevelopmental and psychosocial complexities, to improve health outcomes and quality of life for women with ADHD across the lifespan.

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**Data availability**
No datasets were generated or analysed during the current study.

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**Ethics approval and consent to participate**
Not applicable.

**Consent for publication**
Not applicable.

**Competing interests**
The authors declare no competing interests.

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## Publisher's Note



**Kati Krebs** is a Clinical Nurse, Midwife, and academic with over two decades of diverse experience across primary health, maternity, Indigenous health, and child development services. This professional background, combined with a late diagnosis of ADHD at the age of 46, informed the analysis undertaken in this integrative review. The outcomes and recommendations are both grounded in evidence-base and reflected in the re-occurring themes observed among women in clinical care, many of whom experience barriers to diagnosis and treatment of ADHD and comorbid conditions. These barriers are multifaceted, arising from gender-bias, structural and systemic inequities, and socioeconomic disadvantage.

**Roslyn Donnellan-Fernandez** is a Midwife and Registered Nurse with diverse clinical experience in provision, implementation, management, and evaluation of optimised models of maternity care for priority populations. She is current director for Postgraduate Primary Maternity Care programs at Griffith University where inter-disciplinary engagement of health professionals and communities is focused on education and research to positively transform people, services and systems.