



# Women with Attention Deficit Hyperactivity Disorder and Perinatal Distress: A Literature Review

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## Abstract

Although the childbirth is considered a pleasant experience in a woman's life, there are cases that the mental health and well-being of mother is affected. On the other hand, women with Attention-Deficit/Hyperactivity Disorder are more likely than men to have one or more comorbidities, including schizophrenia, autism spectrum disorder, suicidal behavior, depression, bipolar and tic disorders. This increased risk suggests that women are a more vulnerable population during the perinatal period. The aim of this study was to determine the effect of Attention-Deficit/Hyperactivity Disorder symptomatology on women's mental health status during the perinatal period, through an investigation of the literature. These studies found that throughout the perinatal period, women with Attention-Deficit/Hyperactivity Disorder are more at risk of developing perinatal stress, especially during postpartum period and highlights the need for more research on perinatal mental health and the need also for a pregnancy screening program in the general pregnant population as well as in pregnant women suffering from ADHD.

**Keywords:** *ADHD; Attention-Deficit/Hyperactivity Disorder; women; perinatal mental health; perinatal distress.*

## Introduction

While the birth of a child is considered a pleasant experience in a woman's life, there are cases that mental imbalance occurs and therefore, the well-being of mother and child is affected [1]. As an outcome, perinatal distress, including depression and anxiety [2], is a major complication which seems to undermine the development of the mother-child bond, the relationship with the partner and the balance of the family in general. Perinatal distress can be attributed to the drastic psychological and social changes that mothers face during the perinatal period [3]. The prevalence of perinatal distress ranges from 10.1 to 75.6% for anxiety, and from 4.8 to 86.5% for depression [4].

On the other hand, Attention-Deficit/Hyperactivity Disorder (ADHD) is defined as a developmental disorder that can affect a person's abilities in daily life and it is usually first diagnosed in childhood [5]. Adults with ADHD: a) must have  $\geq 5$  symptoms of inattention and/or  $\geq 5$  symptoms of hyperactivity/impulsivity that have persisted for  $\geq 6$  months and negatively affect social and academic/occupational activities; and b) many symptoms were present before the age of 12; c) the symptoms must be present in  $\geq 2$  settings (at school, work, home, with friends or family, or in other activities); d) the symptoms reduce the quality of social, academic, or occupational functioning; e) the symptoms do not appear in the context of a psychotic disorder or the use of certain substances [6].

While ADHD is thought to primarily affect children, particularly young males, ADHD symptoms are now known to affect both adult men and women with an attenuated symptomatology and gender diversity [7]. However, both the perception that ADHD is a 'male disorder' and gender differences in symptom presentation and comorbidity mean that women with ADHD symptoms are less likely

to be underdiagnosed compared to men [8,9]. Indeed, relative to hyperactivity and impulsivity, girls are described as more talkative, excitable, dramatic, bossy, and emotionally reactive, and usually these symptoms are ignored by parents and teachers [10]. Adolescent females are also more likely to suffer from low self-esteem, to start smoking or get pregnant while still in high school [10,11].

In addition, women with ADHD are more likely than men to have one or more comorbidities, including schizophrenia, autism spectrum disorder, suicidal behavior, depression, bipolar disorder and tic disorders [12,13]. This increased risk suggests that women are a more vulnerable population. Since, more males than females are diagnosed with ADHD, fewer clinical studies include large samples of women with ADHD [12]. In addition, based on their past traumatic events, associated with educational, marital and occupational domains [14], women with ADHD report a greater number of stressful life and anxiety disorders [15]. Also, the impaired social relationships of these individuals reduce social support networks and thus, contribute to the worsening of already existing mental disorders [16]. As it also appears, premenstrual dysphoric disorder, postpartum depression and menopausal negative mood symptoms affect women with ADHD more often [17].

Despite the data that social support and specifically the role of the partner during the perinatal period can help reduce stress and mental health problems or moderate their impact [4], women with ADHD symptoms usually lack this support due to the difficulty in social relationships and therefore, the symptoms of perinatal distress may increase [18]. In addition, the high number of unplanned pregnancies in these women suggests an inability to form a plan for possible future events, even the need for birth control [14]. However, unintended pregnancies contribute to increased risks of perinatal distress, and parenting stress in general [19]. Despite the potential

risks for women with ADHD symptoms in the perinatal period, this field is still underexplored. However, understanding the impact of ADHD symptoms in the perinatal period offers a number of advantages for mother-infant. For example, assessment of ADHD symptoms during pregnancy screening and early referral for further testing is expected to help better support of maternal well-being and fetal/infant health.

The aim of this study was to determine the effect of ADHD symptomatology on women's mental health status during the perinatal period, through an investigation of the literature.

## Materials and Methods

In order to meet the aim of the study, a literature review of relevant studies was conducted. The research was carried out based on Google Scholar, PubMed/Medline, and PsycINFO.

The inclusion criteria were: original articles focusing on perinatal distress of women with ADHD, published in the last 15 years. The exclusion criteria were: reviews, literature reviews, systematic reviews, letters to editors, articles written in other language than English and articles which did not focus on the relationship between ADHD in women and perinatal distress.

The keywords were used as follows: Women with Attention-Deficit/Hyperactivity Disorder OR ADHD AND Perinatal Distress; Women with Attention-Deficit/Hyperactivity Disorder OR ADHD AND Perinatal depression; Women with Attention-Deficit/Hyperactivity Disorder OR ADHD AND Perinatal Anxiety; Women with Attention-Deficit/Hyperactivity Disorder OR ADHD AND antenatal period; Women with Attention-Deficit/Hyperactivity Disorder OR ADHD AND postnatal period. The review analyzed the women's exposure to diagnosed ADHD symptomatology and as an outcome we analyzed perinatal distress (depression or anxiety) during the perinatal period, documented with specific psychometric tools.

The timeline was set from 2007 to 2022 and out of 640 articles only 7 were included in the review. More specifically, the research articles identified through the initial review were first screened by title and abstract. Then, the full text of studies was examined against the inclusion and exclusion criteria and from a total of 100 studies, a total of 98 reviews, literature reviews and meta-analyses were rejected, as well as 2 articles in other language than English. Finally, 7 articles were included in the review.

The extracted data included: study setting, study population, assessment tools used for QoL evaluation, country, and outcomes relevant to the literature review objectives. As mentioned above, disagreements were resolved by discussion.

## Results

This literature review identified 7 articles from 2007 to 2022 that met the inclusion criteria and the purpose of the study (Table 1). The majority of studies were conducted in Canada and U.S.A. The sample size varied between from 40 to 1204 women, during their antenatal and postnatal period. Five studies were cross-sectional and

2 were cohort studies. In addition, all studies used specific psychometric tools for the diagnosis of perinatal distress.

### Antenatal distress

Three studies evaluated the antenatal distress of women with ADHD symptoms. More specifically, a cross-sectional study from Canada [14], which investigated the relationship between ADHD symptoms of 86 nulliparous women with behaviors and mental health status during pregnancy. The results of this study showed that women with severe ADHD symptoms suffered from depression and anxiety and had fewer positive expectations regarding their self-efficacy and future maternal role. These women as well were less likely to have a university education and to be married at the time of conception. The results of another cross-sectional study [22], which investigated the relation of ADHD symptoms in women and prenatal health behavior, showed that ADHD symptoms in pregnancy were associated with prenatal depression. Depressive symptoms were also associated with the use of caffeine, smoking and poor eating. However, depression did not appear to be related with the socio-economic status of pregnant women. In addition, another recently published study [8], which analyzed the impact of ADHD in pregnancy in maternal well-being, highlights the importance of social support from family, friends and significant others, to reducing mental health issues. Furthermore, in the third trimester of pregnancy, ADHD symptoms were associated with higher stress and depressive symptoms, preterm birth, unwanted pregnancies and the use of tobacco.

### Postnatal distress

On the other hand, ADHD symptoms also affect the mental health of women in postpartum period. A study published in 2009 [21] on 99 mothers mentioned that women suffering from ADHD were more likely to have psychological distress and less likely to have lower maternal satisfaction. The findings also indicated that mothers with sub-clinical symptoms of ADHD were at risk of developing behaviors that may negatively affect their infant's development. Similar findings were presented from [22], which analyzed the link between maternal ADHD and maternal sensitivity and negative regard. The results from the data analysis of 40 women showed that mothers with ADHD symptoms, especially the inattentive cluster of symptoms, may have anxiety, insensitivity and interaction problems with their infants.

The cohort study of [23], investigated the association of ADHD symptoms of mothers and depression, anxiety, and support in the first year of their postpartum period. However, the results showed that the 57 mothers with ADHD manifested anxiety and depression in greater proportion in this period. Furthermore, a risk factor for low self-efficacy and self-esteem in mothers with ADHD was social anxiety. Finally, a study of [17] assessed the prevalence of symptoms of premenstrual dysphoric disorder, postpartum depression and climacteric mood symptoms in ADHD. Therefore, from this research, a sample of 85 individuals consisted of postpartum women, after being examined with the appropriate psychometric tools, showed that the symptoms of ADHD were associated with high prevalence of postpartum depression.

Table 1: Studies included in the review

Author/Year	Design	Aim of the study	N	Measures	Outcomes
Ninowski 2007, [14] Canada	Cross-sectional	To investigate the relationship between ADHD symptoms and maternal expectations, stressful life events, social support, and behaviors in first-time pregnant women	86 first-time pregnant women.	The BIQ, CAARS, ABCA, BSI-18, PMES, SENR, SSQ6	Women with ADHD were less likely to be married, to have university education, and more likely to have an unwanted pregnancy. Women with ADHD were more likely to have anxiety and depression symptoms and lower maternal self-efficacy.

Watkins,2009 [21] Canada	Cross-sectional	To examine the relationship between clinical and sub-clinical levels of maternal ADHD symptoms and parental cognitions and behaviors.	99 mothers of 6 months old infants	The BIQ, CAARS, PSOC, PACOTIS, ICQ, SSQ6, BSI-18	Mothers with ADHD were more likely to have psychological distress and lower parenting satisfaction.
Semple, <sup>[22]</sup> 2011 Canada	Cross-sectional	To examine if maternal ADHD symptoms are associated with low levels of maternal sensitivity and high levels of negative appraisal	40 Mothers and their infants (3-8 months)	ADHD Quick Screen, ABCA, BSI-18, IBQ	ADHD symptoms were associated with maternal anxiety, insensitivity and difficulties in interactions with infants.
Curtin-McKenna [23] 2013 U.S.A	Cohort	To expand the knowledge base on mothers with a diagnosis of ADHD in the first twelve months after the birth of an infant.	57 mothers of a Mother Woman support group	The ASRS-v1.1	Postnatal depression and anxiety in mothers with ADHD. Social anxiety is a risk factor exerting a negative influence on maternal identity, parenting self-efficacy and self-esteem in mothers with ADHD.
Jones, <sup>[20]</sup> 2018 U.S.A	Cross-sectional	To delineate the relationships between symptoms of ADHD and prenatal health behaviors and to explore whether the symptom clusters of ADHD differentially predict prenatal health behaviors	198 pregnant women	The PHQ-2, The PHBS, The CAARS	Depressive symptoms correlated with all three ADHD symptom Clusters. Depression was associated with smoking caffeine use and poor eating. In addition, depression was unrelated to exercise. Socioeconomic status evidenced a negative relationship with ADHD symptoms.
Dorani, <sup>[17]</sup> 2022 Netherlands	Cross-sectional study	To assess the prevalence of symptoms of premenstrual dysphoric disorder, postpartum depression symptoms and climacteric mood symptoms in ADHD	209 consecutive women between 18–71 years old with ADHD, from which 85 were postpartum women	Neuropsychiatric Interview Plus version, the Edinburgh Postnatal Depression Scale, the Greene Climacteric Scale	49 (57.6%) of postpartum women met the criteria of postpartum depression. This prevalence was much higher compared to the prevalence of general population postpartum women
Murray, <sup>[7]</sup> 2022 Ghana, Jamaica, Pakistan, Philippines, Romania, South Africa, Sri-Lanka Vietnam	Cohort study	The impact of ADHD symptoms in maternal well-being and fetal development	1.204 pregnant women in their third trimester of pregnancy and postpartum	Multidimensional Scale of Perceived Social Support, Alcohol, Smoking, and Substance Use Involvement Screening Test, The PHQ-9 depressive symptoms, the Perceived Stress Scale	ADHD in the third trimester of pregnancy associated with lower social support from family, friends and significant others. Higher stress, and depressive symptoms, increased likelihood of an unwanted pregnancy and premature birth as well as use of tobacco.

## Discussion

The aim of this study was to determine the effect of ADHD symptomatology on women's mental health status during the perinatal period, through an investigation of the literature review. We see from the results that there is a strong correlation between ADHD symptoms and perinatal distress in women. According to the included studies, we see that pregnant women with ADHD are more likely to have anxiety and depression symptoms and less likely to have higher maternal self-efficacy and lower social support from family, friends and significant others [14,20,7]. Many studies have shown that anxiety disorders and depression are highly comorbid with ADHD [24,25], and it is also known that females with ADHD are

more likely to have unrecognized symptoms and therefore, may not be referred early to receive a diagnosis [26]. However, until adulthood, females are more likely to suffer from symptoms of depression, anxiety, and low self-esteem than the females of general population [27]. Low self-esteem is a result of mental discomfort and the need of balance in the social environment [28].

Our results also showed that the majority of pregnant women had unplanned pregnancies and harmful habits, such as tobacco use and poor eating [20,7]. Therefore, the above habits seem to affect the course of pregnancy and often resulting in premature births [7]. According to the literature, the ADHD-smoking relationship remains somewhat unknown. However, it is thought to be due to dysregulation of the dopaminergic and nicotinic-acetylcholinergic

circuits [29]. An explanation that can be given for these results could be that the hyper talkativeness, high arousal, flight of thoughts, inner restlessness and emotional reactivity that are the symptoms of the female gender are signs of emotional difficulties, disciplinary problems and learning or attention difficulties [30].

Our findings regarding the postpartum period showed that mothers with ADHD suffered more often from postpartum distress and lower maternal satisfaction which has a direct effect on the infant [21-23,17]. Depressive symptoms and anxiety are very common during postpartum period which start from early postpartum and can continue for months or even years after giving birth [31]. However, the prevalence of depressive symptoms of women with ADHD are much higher compared to the prevalence of general population postpartum women [17]. Although, there are not many research articles on the effect of ADHD on postpartum, it is well-known that the mental health of women with ADHD worsens during postpartum than normal women. While hormonal fluctuation is the same in all women, mood swings can make it harder for women with ADHD to deal with postpartum depression. More simply, depressive symptoms may last longer and be more intense than the average population of women [32].

While the management of ADHD in pregnancy goes smoothly, it is not always easy to manage the postpartum period. In early postpartum, the levels of estrogen decrease 100 to 1000-fold affecting the mother's brain, while the ADHD medication does not seem to help during periods of intense hormonal changes [33].

## Conclusions

The results of this study suggest that women with ADHD during perinatal period suffer more often from perinatal distress. Pregnancies may be unwanted, and the harmful habits of women may affect the pregnancy outcomes. However, women with ADHD have more mental distress symptoms during postpartum than in pregnancy, because the large fluctuation of estrogen affects psychology more negatively during postpartum. Also, postpartum mental distress affects the mother's feelings towards the infant and therefore has an impact on their mental and physical health. This particular study also demonstrated the need for more studies on perinatal mental health and the need also for a pregnancy screening program in the general pregnant population as well as in pregnant women suffering from ADHD.

## Ethics approval and consent to participate

Not applicable.

## List of abbreviations

ADHD = Attention-Deficit/Hyperactivity Disorder

## Data Availability

Not applicable.

## Conflicts of Interest

There is no conflict of interest regarding the publication of this paper.

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None

## Authors' contributions

E.A. and E.O performed the search of the literature. A.P. was a major contributor in writing the manuscript. All authors read and approved the final manuscript.

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