**ADHD Experiences in Women: Sentiment, Topic, and Emotion Analysis of Reddit Posts**

**Using a Text Mining Approach**

Viktoria Tiltmann (s2326523)

Faculty of Behavioural, Management, and Social Sciences, University of Twente

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1st supervisor: Dr. P.M. ten Klooster

2nd supervisor: Dr. M.E. Pieterse

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**Abstract**

*Objective:* ADHD has long been seen as a disorder mainly found in young boys, resulting in much less research available on the experiences of women with ADHD. Therefore, this study aimed to explore the nuanced experiences of women with ADHD as shared on Reddit.

*Methods:* 1,328 posts from the r/adhdwomen subreddit were scraped and analysed using automated text mining techniques with the software *Orange.* The text mining analysis involved LDA topic modelling, VADER-based sentiment analysis (overall and per topic), and Plutchik's Wheel of Emotions analysis. Given this approach's exploratory and rudimental nature, these analyses aimed to provide an initial and broad overview of discussed themes and sentiments within the subreddit r/adhdwomen.

*Results:* Nine themes were identified through topic modelling such as experiences with receiving a diagnosis and medication, symptom management, interpersonal relationships, and everyday challenges related to for example task structuring, routines, and job demands. The most common topic was *Experiences with ADHD medication, mental health, and symptom management,* accounting for 17.4% of the posts. The posts showed a notable dichotomy of highly positive or negative sentiments, while the overall sentiment was slightly positive ($M = 0.17$). The users expressed the most positive sentiment on the topic related to getting a diagnosis, treatment and medication. The most common emotion in posts identified by text mining analysis was *Trust* (32.28%), followed by *Joy* (27.18%). Negative emotions such as *Sadness* (14.68%) and *Fear* (6.63%), were also prevalent, highlighting the emotional duality expressed by users in the subreddit r/adhdwomen.

*Discussion:* This study suggests that users from the group r/adhdwomen discuss topics related to interpersonal relationships, diagnosis and treatment as well as everyday challenges. This highlights the diverse range of topics, and a broad range of experiences shared in this online community, which is overall in line with previous research. The topic *Process of getting a diagnosis, treatment and medication* showed the most positive sentiment, possibly implying that this process offered relief and self-acceptance. However, the emotional duality also reveals that not only positive experiences but also struggles are shared. Despite limitations, such as potential bias in post-selection, the findings offer uinsights into the real-life experiences of women with ADHD. Expanding the scope to additional platforms or subreddits, such as the general r/ADHD, could provide a broader understanding of similarities and differences across groups.

     *Keywords:* ADHD, women, text mining, topic modelling, sentiment analysis, Reddit, LDA topic modelling, VADER sentiment analysis, Plutchik's Wheel of Emotions.

**Introduction**

Attention-Deficit/Hyperactivity Disorder (ADHD) is a neurodevelopmental disorder that can highly impact daily functioning (Bruner et al., 2015; Safren et al., 2010). Untreated ADHD can result in a decrease in one's general mental health and impact factors such as self-esteem or relationships (Morgan, 2023). Getting a diagnosis as early as possible is crucial to improve treatment outcomes and reduce the risk of suffering from further mental health issues later in life (Barkley & Brown, 2008; Biederman et al., 2009).

ADHD manifests in three subtypes, namely an inattentive type, a hyperactive-impulsive type, and a combined representation (American Psychiatric Association (APA), 2013). The intensity and visibility of the symptoms differ in each person, and how they are expressed can greatly vary. For the hyperactive-impulsive subtype, several criteria are defined in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) for receiving a diagnosis, such as fidgeting, running, or climbing when inappropriate, excessively talking or interrupting other people (APA, 2013). For the inattentive type of ADHD behaviours like difficulties with attention, making frequent mistakes in an academic or work setting, problems with organising, losing things and being forgetful are key traits evaluated for a diagnosis. When both inattention and hyperactivity-impulsivity criteria are present, the combined representation of ADHD can be diagnosed (APA, 2013).

In the past, ADHD was mainly seen as a childhood disorder that does not continue into adulthood (Spitzer et al., 1980), but more recent research suggests otherwise. The global prevalence of ADHD is approximately 2.2 to 17.8% in children, with still around 2.5% to 3% prevalence in adults (Polanczyk et al., 2014). Several researchers suggest an even higher prevalence for adults with 4 to 5% prevalence globally (Almeida Montes et al., 2007; Kessler et al., 2006; Song et al., 2021), highlighting that ADHD can persist into adulthood.

**ADHD in women**

Historically, ADHD was not only considered a disease prevalent soley in childhood, but it was also predominantly diagnosed in male children. Research studies and methods of diagnosing and treating ADHD were based primarily on young boys, with limited research on females, resulting in a gender bias in ADHD diagnosis (Goetz & Adams, 2022). In that respect, studies found that ADHD was diagnosed in male children more frequently, with reported ratios ranging from 2:1 to 9:1 (Arcia & Conners, 1998). Interestingly, a study by Mowlem et al. (2018) explored the differences between male-to-female ratios in clinical-based samples and the general population. They found that the male-to-female ratio for ADHD diagnoses was higher in clinical samples compared to the general population, indicating a sex bias in the process of obtaining a clinical diagnosis and treatment. However, the number of ADHD diagnoses in girls has been increasing in the last few years and studies suggest that the actual gender ratio of ADHD in adults might be closer to 1:1, meaning that women might have ADHD roughly as frequently as men in adulthood (Boyle et al., 2011; Kessler et al., 2006).

Women are not only less likely to be diagnosed with ADHD in the first place, but if they do get diagnosed, they receive their diagnosis and treatment much later in life than males do (Grevet et al., 2006; Quinn & Madhoo, 2014). This might be the case because, for many years, the topic of ADHD in women did not get much attention resulting in little understanding of differential manifestations and the optimal treatment, which left many women undiagnosed and therefore also untreated (Chronis-Tuscano, 2022). With adulthood, women gain more self-insight leading them to seek professional help which they did not get in childhood (Chronis-Tuscano, 2022). Hinshaw (2002) was one of the first researchers to study ADHD in females in more depth and showed that they have academic, psychosocial, and psychiatric impairments that are similar to the impairments men with ADHD face. This

underlines the importance of further research focusing on ADHD in women and gender-specific differences in ADHD.

***Factors leading to underdiagnosis in women***

Several factors have been suggested to underlie this possible underdiagnosis of ADHD in women. Men and boys typically exhibit more noticeable hyperactive-impulsive behaviour, resulting in more frequent diagnoses (Quinn, 2005). Mowlem et al. (2019) concluded that externalising behaviours present in the hyperactive-impulsive subtype are the main predictors for a referral to get a clinical diagnosis and treatment. In contrast, women tend to display the inattentive subtype more often (Quinn, 2005; Ramtekkar et al., 2010). This subtype is typically seen as less disruptive and problematic and is also usually less visible and therefore less diagnosable (Biederman et al., 2019). As women often tend to display the criteria of this subtype solely, they do not end up with a clinical diagnosis unless they also show externalising symptoms.

Additionally, societal expectations for women to conform to normative feminine behaviour contribute to underdiagnosis, as it leads to masking strategies to hide their symptoms to fit in, complicating the diagnostic process (Hinshaw et al., 2022; Mowlem et al., 2019). Another reason according to Taylor and Keltner (2002) might be that females with ADHD tend to have a higher IQ level compared to males resulting in better academic performances even with ADHD, and in turn in less noticeable signs teachers or parents could observe. Moreover, women are frequently misdiagnosed with other disorders like anxiety or depression instead of ADHD (Chronis-Tuscano, 2022) as a result of masking their symptoms, fear of failing or not meeting the expectations of others and not receiving the necessary treatment for ADHD. A study by Quinn (2005) further underlined this point, as 14% of girls with ADHD, and only 5% of boys, were prescribed an antidepressant before treating the ADHD itself.

### *Consequences of under- or misdiagnosis*

The under- or misdiagnosis can have an enormous impact on the women's self-esteem and mental health, as they feel misunderstood and do not receive necessary help (Attoe & Climie, 2023; Hinshaw et al., 2012; Stenner et al., 2019). Women with ADHD often experience self-doubt and develop distrust in the medical system when they do not receive the treatment they need (Bullo, 2018). Furthermore, studies found that males with ADHD are prescribed medication and receive treatment in general more often compared to females (Derks et al., 2007), highlighting a possible public health concern regarding the undertreatment of women (Rucklidge, 2010).

Previous research found a wide range of impairments in un- or misdiagnosed women with ADHD. One study revealed that women with ADHD are more likely than men to experience heightened rates of anxiety, depression, and emotional dysregulation (Robison et al., 2008). Additionally, women with ADHD are at increased risk of engaging in risky sexual behaviour, experiencing unplanned pregnancies, and being more vulnerable to sexual harassment and abusive relationships compared to women without ADHD (Young et al., 2020). Undiagnosed ADHD in women has also been linked to maladaptive, emotion-based coping strategies, including the misuse of drugs, alcohol, nicotine, or other forms of self-medication (Bartlett, 2005; Pinkhardt et al., 2009; Rucklidge, 1997; Stenner et al., 2019). All these factors underscore the urgent need for more research into the unique experiences of women with (undiagnosed) ADHD. Despite growing recognition of its importance, there is limited research on sex-specific experiences with ADHD and further research has been highly suggested by previous researchers (Chronis-Tuscano, 2022; Mowlem et al., 2018). As these experiences can be diverse and have many different facets, capturing the womens perspectives requires an approach that allows for an unfiltered exploration of their lived experiences without focusing on specific aspects, but rather to gather a broad overview of topics and sentiments that emerge in real-world discussions.

**ADHD and social media**

One way to learn more about the real-world experiences of women with ADHD is to analyse social media data. In recent years, social media has gained popularity and has become a powerful tool for individuals to connect, share and seek support. Recent studies found that individuals with ADHD tend to spend more time on social media compared to other groups (Dekkers & van Hoorn, 2022). For neurodivergent individuals in general, including people with ADHD, social media offers a platform to seek emotional and practical support, validation, and acceptance from peers online (Eagle & Ringland, 2023; O´Leary et al., 2017). This behaviour may be partly explained by the stigma they face in their life offline (Hansson Halleröd et al., 2015; Waite & Tran, 2010). The social challenges associated with ADHD, such as maintaining close friendships, peer rejection and stigma, lead many to seek acceptance in supportive online spaces (Dekkers & van Hoorn, 2022; Kwon et al., 2018). In a study by Masuch et al. (2019), 89% of people with ADHD reported experiencing discrimination related to their condition. Others often perceive them as lazy, incompetent, weak and irresponsible (Zhao et al., 2021) and even question the legitimacy of their diagnosis and medication (Mueller et al., 2012). Also, teachers and parents have been found to possess a negatively biased attitude toward ADHD, resulting in less helpful social support and being an additional barrier to general help-seeking behaviour (Lebowitz, 2016).

Even if individuals with ADHD do not experience direct stigmatization, already the possibility of being stigmatized can lead to internalized ableism, leading to avoidant behaviours (Corrigan & Roa, 2012). These negative thoughts about people with ADHD can cause the affected individuals to not reveal and talk about their ADHD out of fear of getting stigmatized and therefore miss out on social support (Hansson Halleröd et al., 2015; Waite & Tran, 2010). However, social support is a crucial resource for people with ADHD to increase their daily functioning. Studies highlighted that having a supportive spouse or friend can provide help with organizing and meeting responsibilities (Meaux et al., 2009; Toner et al.,

2006). A qualitative interview study among women with ADHD revealed that they expressed a strong interest in having access to support groups to learn from the experiences of other women in similar situations (Waite & Tran, 2010). Many of these women reported that they did not feel able to openly discuss their own ADHD experiences in many cases because they were afraid of judgment (Waite & Tran, 2010). Studies have indeed shown that young women with ADHD often prefer online communication instead of face-to-face interactions and they use social network sites and discussion forums to share personal experiences and challenges (Mikami & Normand, 2015; Thelwall et al., 2020). This makes social media especially valuable as a safe space where women with ADHD can share their experiences and find support without the fear of stigma. Therefore, social media data can provide valuable insight into the lived experiences of women with ADHD, a group often underrepresented in traditional research.

Reddit is a popular platform for exchange and discussion on specific topics. It is a widely used social medium with 504 million users in 2024, characterised by numerous specialized communities, the so-called subreddits (Statista, 2024). This distinguishes Reddit from other platforms as users can turn to domain-specific groups and therefore identify as a member of such a community. In these subreddits users can share personal experiences and questions, seek support, or discuss topics and through the specified subreddits a virtual support network is created to tackle concrete needs and interests (O´Leary et al., 2017). These users generate a large number of posts daily, which allows researchers to gather large volumes of organic and personal textual data from women with ADHD (Mikami & Normand, 2015; Thelwall et al., 2010). As there is no comparable feasible alternative to reach so many people who identify or deal with the issue of ADHD in women, it underlines that analysing the genuine, unfiltered discussions shared on such subreddits might provide real-world insights into the experiences of women with ADHD.

**Current study**

However, the large volume of textual data from social media platforms also makes it impractical to manually analyse this information. To address this, text mining has emerged as a method to process the wide range of unstructured data that social media offers (Medvedev et al., 2019). With the help of text mining, researchers can apply algorithms to automate the analysis of posts on social media to identify common themes, sentiments, and patterns across hundreds of posts (Hassani et al., 2020).

To date, no studies have analysed content from the subreddit r/adhdwomen using text mining methods. This study aims to explore the diverse experiences and sentiments of women with ADHD by conducting a text-mining study of scraped posts of the subreddit r/adhdwomen. However, it is important to clarify that this study does not aim to test specific hypotheses but rather serves as an initial exploratory attempt to identify broad patterns of discussion within this community. By using an automated text mining approach to analyse large amounts of organically occurring user-generated content, this approach enables unobtrusive exploration of discussions and will investigate the discussed topics and sentiments expressed by users within that community.

This study`s exploratory and rudimental nature implies that the findings are intended to provide insights into possible emerging trends and themes within this ADHD community on social media, rather than provide definitive conclusions. By analysing the unfiltered experiences of women with ADHD in an online setting where they might feel more comfortable sharing their thoughts and experiences openly, this study aims to identify overall topics, which could be further analysed in future studies and contribute to the growing understanding of ADHD. This study will also examine both the overall sentiment, but also the specific emotions expressed in the discussion on the subreddit r/adhdwomen. Sentiment analysis will provide an initial understanding of whether discussions in this online community tend to be more positive, negative, or neutral, offering insight into the general tone of the

conversation (Hutto & Gilbert, 2014). Additionally, emotion analysis based on Plutchik`s Wheel of Emotions will allow for a more nuanced exploration of the specific feelings conveyed within the community (Bioinformatics Laboratory, University of Ljubljana, 2016).

Given the exploratory nature of this study, the following research questions aim to provide an initial, rudimentary understanding of the discussion and to uncover broad themes and sentiments in the subreddit r/adhdwomen:

RQ1: What are common topics in discussions among women with ADHD?

RQ2: What is the overall sentiment expressed in the ADHD in women group?

RQ3: How do sentiments differ across various common topics in discussing ADHD in women?

RQ4: What are the specific emotions expressed in the ADHD in women group according to the Plutchik wheel of emotions?

**Methods**

This study used a text mining approach to answer the research questions. Text mining is a method that uses natural language processing (NLP) techniques and machine learning to automatically extract meaningful insights and patterns from a large amount of unstructured text-based data (Feldman & Sanger, 2007; Hotho et al., 2005; Miner et al., 2012). Text mining has proven particularly effective in analysing social media data, as social media contains a wide range of user-generated unstructured data (Medvedev et al., 2019). Given the extensive discourse about ADHD in women on Reddit, text mining allows us to gather large volumes of data for the analysis of organic, personal, and nuanced experiences of women with ADHD (Mikami & Normand, 2015; Thelwall et al., 2010).

Using text mining techniques to analyse social media data has multiple potential advantages over other research approaches or qualitative content analysis for exploring the perspectives of women with ADHD. Due to the nature of social media, the population studied is usually diverse and therefore makes it possible to capture unique and individual thoughts.

Furthermore, the unobtrusive nature of social media ensures that the expression of opinions and sentiments is not influenced by the presence of a researcher, resulting in a rather authentic insight into their experiences (De Choudhury & De., 2014; Kuss & Griffiths, 2011). Finally, the scalability of automated text mining allows efficient analysis of large datasets, giving the possibility to collect a vast number of posts on Reddit to explore different views on this topic (Han et al., 2011; Weiss et al., 2010).

Text mining for this study consisted of the following steps: data collection, preprocessing, topic modelling, sentiment analysis and emotion analysis. The pipeline of the current study is visualised in Figure 1. The text mining analyses, from pre-processing to the actual analysis, were performed with the Orange Data Mining software (Version 3.37.0), which is an open-source analysis tool that is Python-based (Demsar et al., 2013). This software gives the option to create a workflow, without coding, but by adding widgets for various analysis steps such as preprocessing of data or performing topic modelling (Bioinformatics Laboratory, University of Ljubljana, 2024). Additionally, the software allows visualising findings in different forms such as scatterplots or bar plots.

**Figure 1**

*Text Mining Pipeline*

**Data Collection**

Data for this study was scraped from the subreddit r/adhdwomen. The subreddit has more than 325.000 members and offers a space for women to find support and discuss experiences with ADHD. However, it is important to note that everyone can join this subreddit, so it cannot be verified that all posts were indeed written by women. Like other subreddits, it offers the opportunity to connect with peers more easily and as it is easy and free to join these subreddits, it is a low burden for people with diverse backgrounds to take part in the discussion (Eagle & Ringland, 2023). This enriches the diversity of data and therefore the representativeness of the sample.

The data collection was performed with the Python Reddit API Wrapper (PRAW) version 7.7.1, which is a software package that can interact with Reddit's Application Programming Interface (API) (*PRAW 7.7.1 Documentation*, 2023). The data was scraped on the 21st of October 2024, so it can include original posts until that date. In Reddit, the posts of each subreddit can be filtered by several categories. The scraping process targeted two categories, namely the 'top' and 'hot' rated posts. Top posts are characterised by being 'up' and 'down' voted the most and tend to be the most relevant themes in the group (Park et al., 2017). Secondly, posts from the category 'hot' were scraped, which are the most recent top-voted posts. This can add newly emerging topics that could be of current importance (Park et al., 2017). A maximum of 1000 posts was set for each category as the Reddit API limits the number of scraped posts to 1000 (Andalibi et al., 2018). However, as the categories 'top' and 'hot' tend to overlap greatly, therefore the final number of scraped posts before preprocessing was 950 unique posts from the category 'hot' and 379 unique posts from the category 'top'. For each post, the title, the text of the post itself and the number of upvotes were scraped. Additionally, the corresponding comments per post were scraped but were not used for the final analysis of this paper, as this would go beyond the scope of this work.

Only posts with text were included, which automatically excluded image-based or link-only content. Additionally, it was specified that each post gets only scraped once, to ensure that there are no double posts. In the end, all the scraped data was saved in a CSV file for further processing and analysis.

**Data preprocessing**

Text preprocessing is essential to transform the raw data into data that is suitable for meaningful, computerized analysis to ensure the interpretability of the content and to increase the reliability and validity of the results (Simmons et al., 2011). Text preprocessing consisted of transformation, tokenisation, lemmatisation and stop word removal.

*Transformation*

All posts were transformed to solely lowercase letters, which leads for example, "ADHD" and "adhd" to be identified as the same word. This unifies the data and makes further analysis like creating a stop word removal list easier (Raja & Thangavel, 2019). Additionally, accents and URLs were removed from all posts.

*Tokenization*

This step involves breaking down the textual data into individual units. This will treat each word as a distinct feature of the text for later analysis. This was done in the preprocessing text widget in Orange using the standard regular expression (Regexp) setting.

*Lemmatization*

Lemmatization involves the reduction of a word to its root form, called lemma, while keeping it as a valid word. This simplifies the vocabulary and makes the data more comprehensive. For this study, the pre-trained UDPipe Lemmetizer was used. In contrast, stemming would reduce words to their base form by removing prefixes and suffixes (Manning et al., 2008). For example, the words "diagnosis" and "diagnose" would be changed to "diagnos." As that would result in grammatically incorrect words, making the interpretation more difficult, lemmatisation was chosen for this study.

*Filtering*

Stop word removal was used to delete common words like "and" or "the" from the data that are unlikely to provide value for the analysis (Banks et al., 2018). First, the standard stop word list in English, which is available in Orange, was used. To further eliminate specific words that are not relevant for analysis, a word cloud was generated to get an idea of how meaningful the data is and to iteratively create a customized stopword list. The final stopword list that was used for this study can be found in Appendix A. Furthermore, the filtering option Regexp in the Orange preprocessing widget removed any punctuation marks from the textual data. Additionally, tokens that were present in less than 5% or more than 95% of all posts, were filtered out to remove overly common or rare words, as these are unlikely to provide additional meaningful insights. It also strongly increased the topic coherence, making the dataset more interpretable.

**Data mining**

*Topic modelling*

The main text mining analyses consisted of topic modelling, sentiment analysis and Plutchik's Wheel of Emotions analysis. Topic modelling is a technique to identify themes within a dataset (Blei et al., 2003). More concretely, Latent Dirichlet Allocation (LDA) was used to identify common topics discussed in the *ADHD in women* group on Reddit (RQ1). LDA is a probabilistic topic modelling technique that groups words that frequently occur together to detect main themes from large unstructured data (Blei et al., 2003; Griffiths & Steyvers, 2004). Studies have proven the high accuracy of LDA, and it has been shown to be superior to other topic modelling techniques such as Latent Semantic Indexing (LSI) and was previously and successfully used for social media data (Negara et al., 2019), which makes it an appropriate tool for uncovering recurring themes discussed by women with ADHD on social media.

To determine the optimal number of topics for the data set, coherence scores were computed. This involved calculating and comparing coherence scores for increasing numbers of topics. The coherence score can lie between -1 and 1, with a higher score indicating better coherence. To visualise these scores a line plot was created. However, Zvornicanin and Martin (2024) explained that solely basing the decision of the topic number on the highest score might be impractical and suggest that one should also consider how many topics seem manageable for interpretation. This ensures a balance between having enough topics to capture the variance in the data while avoiding heavy overlap.

After deciding on the optimal number of topics, the labelling process started. For this, the list with the ten most frequent keywords for each topic was analysed thoroughly and a fitting descriptive label was chosen. To get a second opinion on this label, ChatGPT (Version 4) was used. Recent studies have examined the potential of ChatGPT and other large language models (LLMs) in qualitative analysis and have demonstrated the ability to identify themes, generate labels, facilitate coding processes and generate topics comparable to those of human researchers with reasonable validity (Tai et al., 2024; Zhu et al., 2023; Theelen et al., 2024). However, the research also highlights its limitations, particularly in handling complex, contextual classifications (Aldeen et al., 2023; Zhu et al., 2023). Considering these findings, ChatGPT was used as a second labeller in this study to provide an additional perspective, while the final labelling decisions were made by a human researcher to ensure accuracy and contextual understanding.

The ten keywords for each topic were provided along with the prompt "*I am conducting a study on ADHD in women based on the subreddit r/adhdwomen.  I have a dataset containing posts from this subreddit that have been pre-processed for analysis. Next, I performed Topic modelling (LDA) with the software Orange. I need help labelling the topics based on the keywords provided*." The results from ChatGPT and the researcher were compared and the researcher decided on a final label. To make this decision more informed,

some sample posts from each topic were read by the researcher to get a deeper understanding of the content.

*Sentiment analysis*

Next, sentiment analysis was done to examine the sentiments expressed in discussions within the ADHD in women group (RQ2). Additionally, it was analysed how these sentiments vary across the common topics identified (RQ3). The Valence Aware Dictionary and sEntiment Reasoner (VADER) sentiment analysis in Orange was chosen to classify the sentiments of posts as either positive, negative, or neutral and to compute compound sentiment scores on a scale from -1 to +1 (Hutto & Gilbert, 2014). According to Hutto (n.d.), a compound score above 0.05 is interpreted as positive, while scores below -0.05 are considered negative. Scores between -0.05 and 0.05 are seen as neutral. VADER is based on the lexicon approach of sentiment analysis, which relies on a corpus with sentiment scores from a reference word list containing a list of positive, neutral, and negative words. VADER has been shown to achieve excellent results in the analysis of sentiments on social media, making it a good choice for this study (Hutto & Gilbert, 2014). First, the overall mean compound sentiment score for the whole dataset was calculated and a histogram was created to get a general picture of the distributions of the sentiments in the whole dataset.

For further analysis, each post was assigned to the topic that it scored the highest in, meaning the topic this post most likely belongs to. This was done with IBM® SPSS® Statistics software 29 (*IBM SPSS Statistics*, 2024). Next, the mean compound sentiment score per topic was calculated with SPSS 29 and a one-way ANOVA was performed to check whether there were statistically significant differences in average sentiment scores across topics. Afterwards, post hoc pairwise comparisons were conducted using Tukey`s HSD test to examine significant differences in compound sentiment scores across the topics.

***Plutchik's Wheel of Emotions***

In addition to the overall sentiment of the posts, the specific emotions expressed in the posts were identified with the help of the Tweet Profiler Widget in Orange. This Widget offers an automated, machine learning-based approach to classify emotions. The textual data from the posts is processed by the widget and sent to a server, where the probability of the various emotions is automatically determined (Colnerič, 2019).

The Tweet Profiler widget provides three classification models, namely the Profile of Mood States (POMS), Ekman`s classification of emotions and Plutchik`s Wheel of Emotions. POMS includes the emotion categories Tension, Fatigue, Vigor, Anger, Depression and Confusion (McNair et al., 1971). Ekman suggested a set of emotions based on observing facial expressions and defined Anger, Disgust, Fear, Joy, Sadness and Suprise as basic emotions (Ekman, 1992). Building on this, Robert Plutchik expanded the model by two further emotions namely Anticipation and Trust (Plutchik, 1982).

This study employed the emotion classification based on Plutchik's Wheel of Emotions, as it provides a comprehensive framework by categorizing emotions into eight primary types, offering a more nuanced analysis of emotional expression compared to the other classifications. The eight emotions analysed in this study represent both rather positive and negative emotions namely Anger, Anticipation, Disgust, Joy, Fear, Sadness, Surprise, and Trust (Bioinformatics Laboratory, University of Ljubljana, 2016; Plutchik, 1982). According to Plutchik's theory, these emotions can be seen as bipolar, meaning that each emotion has a direct opposite and joy contrasts with sadness, anger with fear, trust with disgust, and surprise with anticipation (Plutchik, 2001). The multi-class setting of the Tweet Profiler Widget was used in this study, which outputs the most probable emotion for each post.

**Results**

The final analysis was based on 1328 unique posts from the subreddit r/adhdwomen.
The posts received an average of 661 upvotes and 99 comments. The length of the posts
ranged from 1 to 3,954 words, with a mean of 185 words per post. Figure 1 displays the
tokens that were used most frequently in the dataset after preprocessing, with larger words
being more frequently used. This gives a first visualised overview of the content shared in the
subreddit.

**Figure 2**

*Word Cloud after Preprocessing*



The most used word in all posts was *struggle*, but also words like *hard* and *issue*
belong to the 50 most used words (Table 1). This might underline that users of the subreddit
talk about difficult times and experiences they might face as women with ADHD.
Furthermore, words like *diagnosis*, *medication*, *med, adderall, psychiatrist* and *doctor* might
indicate that women share their experiences around the process of getting a diagnosis and
treatment. Posts also mention many words that seem to deal with their *symptoms*. Words like
*focus*, *remember*, *sleep, read, forget, cleaning* or *routine* might all talk about the experiences

and areas of difficulties the women in the subgroup have. Another group of words that stand out in the word cloud are concerned with interpersonal relationships, with words such as *friend, husband,* or *family.* Lastly, words including *ask, advice, support* and *learn* suggest that female users with ADHD want to connect and get support from other users in that group.

**Table 1**

*50 most Mentioned Tokens after Preprocessing in the Subreddit r/adhdwomen*

| Word | Frequency | Word | Frequency | Word | Frequency |
|---|---|---|---|---|---|
| struggle | 361 | women | 228 | kid | 171 |
| diagnose | 353 | read | 219 | change | 170 |
| job | 331 | forget | 218 | symptom | 167 |
| med | 329 | diagnosis | 217 | person | 167 |
| eat | 282 | brain | 210 | doctor | 167 |
| medication | 271 | bad | 207 | advice | 165 |
| hard | 270 | home | 202 | husband | 164 |
| talk | 267 | issue | 198 | move | 159 |
| friend | 257 | task | 195 | share | 153 |
| experience | 255 | focus | 192 | lose | 152 |
| ask | 253 | remember | 189 | problem | 151 |
| anxiety | 247 | school | 186 | family | 150 |
| better | 244 | finally | 181 | adderall | 148 |
| long | 242 | morning | 174 | house | 146 |
| sleep | 236 | hate | 174 | plan | 146 |
| new | 232 | mean | 173 | place | 146 |
| love | 230 | live | 171 | | |

**Topic modelling**

With the *Topic Modelling* widget in Orange, the coherence score was calculated for one to 20 topics. The coherence score was rather similar for different numbers of topics and fluctuated from 0.542 (four topics) to 0.586 (16 topics). However, when taking the interpretability of the ten most used words per topic into account it was decided to define nine topics. This decision was made as for this number of topics the coherence score showed the first peak (Figure 3) and had overall the second largest coherence score (0.583). Additionally, when looking at the most frequent words per topic, choosing 16 topics, which showed the highest coherence score, would generate a larger overlap in topics resulting in more similar topics. Therefore, nine topics were considered to offer a good balance between a high coherence score, as well as interpretability of the keywords.

**Figure 3**

*Topic Coherence scores for 1-20 topics visualized in a line graph*
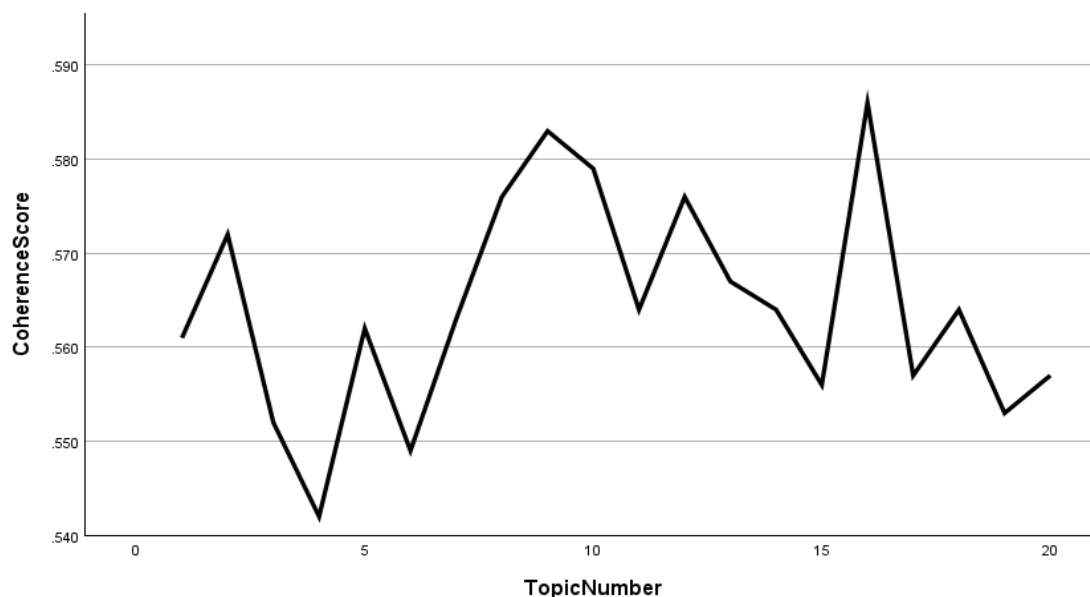


The ten most used words per topic, along with the frequency of each topic are displayed in Table 2. The results indicate a variety of themes associated with ADHD that are discussed in the subreddit r/adhdwomen. These topics are given subsequent labels and are

analysed further in the following section. The final labels for each topic are provided in Table 3.

**Table 2**

*Nine identified topics and ten most used keywords per topic*

| Topic | Keywords | Frequency (N) | % |
| --- | --- | --- | --- |
| 1 | woman, relationship, read, partner, book, struggle, house, better, support, love | 137 | 10.3% |
| 2 | job, medication, better, med, ask, home, new, diagnose, diagnosis, psychiatrist | 138 | 10.4% |
| 3 | school, diagnose, anxiety, doctor, diagnosis, job, struggle, friend, talk, energy | 101 | 7.6% |
| 4 | med, diagnose, focus, anxiety, struggle, experience, medication, depression, symptom, diagnosis | 231 | 17.4% |
| 5 | sleep, hard, night, med, late, appointment, therapy, therapist, fuck, turn | 142 | 10.7% |
| 6 | adderall, husband, ask, miss, plan, family, job, love, stress, new | 122 | 9.2% |
| 7 | clean, room, task, body, cleaning, finally, remember, forget, buy, book | 154 | 11.6% |
| 8 | friend, talk, edit, diagnose, cry, forget, thank, woman, person, comment | 165 | 12.4% |
| 9 | eat, morning, food, wake, sleep, routine, phone, struggle, care, hate | 138 | 10.4% |

After analysing the keywords and reviewing sample posts in-depth, the researcher assigned labels to each topic, as shown in Table 3. These labels were then compared with the labels generated by ChatGPT. Although these two sets of labels were generally similar, some

distinctions arose, as ChatGPT opted for a more specific label for some topics. In the end, it was decided to choose a rather specific topic instead of a general one, as done by the first label of the researcher. This ensures to cover concrete topics of interest that are discussed, instead of generic labels that do not give a great amount of insight into the content of the social media group. Example posts for each topic can be found in Appendix B.

The most discussed topic, accounting for 17.4% of all posts in the dataset, is topic 4 which was labelled *Experiences with ADHD medication, symptom management and mental health*. This topic is characterised by terms such as *medication, diagnosis, depression, anxiety,* and *symptoms*, which suggest a strong focus on the management of the symptoms women with ADHD experience as well as their experiences with medication. This theme might reflect the lived experiences of women managing ADHD, including co-occurring mental health challenges. While this topic shares some overlap with *Getting a Diagnosis, Treatment, and Medication (Topic 2)*, which accounts for 10.4% of posts, the latter focuses more on the process of obtaining a diagnosis and beginning treatment, instead of the ongoing experience. Keywords such as *diagnosis, psychiatrist, new,* and *medication* suggest that Topic 2 revolves around the struggles and journey involved in receiving a formal ADHD diagnosis and initiating treatment, particularly as a woman.

Interpersonal relationships emerged as another critical area of discussion, with three topics covering different facets of relationships. *Navigating (Romantic) Interpersonal Relationships (Topic 1)*, representing 10.3% of the dataset, focuses on navigating emotions, communication, and struggles within interpersonal relationships, including romantic partnerships. Keywords such as *relationship, partner, love,* and *support* suggest challenges related to maintaining emotional connections and addressing relational difficulties caused by ADHD symptoms. Similarly, *Family and Stress Management (Topic 6)*, discussed in 9.2% of posts, has keywords like *husband, plan, family,* and *stress* and focuses on the challenges ADHD introduces within family dynamics, including managing responsibilities as a wife or

mother and balancing stress and demands. Lastly, the second most common topic in this dataset is Topic 8 (*Friendships and Social Support)*, which accounts for 12.4% of posts and uses keywords like *talk, thank* and *friend*. This topic addresses difficulties in forming and maintaining friendships when having ADHD and therefore focuses more on non-romantic relationships. It captures not only struggles with building real-world connections but also the value of online group connections of the subreddit. Collectively, these topics underline the profound impact ADHD has on interpersonal relationships, from romantic and familial relationships to platonic friendships.

Coping strategies and the challenges of managing everyday life and symptoms also emerged as significant discussion elements. Theme 5 labelled *Sleep Issues and Therapeutic Interventions*, revolves around struggles with maintaining healthy sleep patterns and engaging in mental health therapies for ADHD. Keywords such as *sleep, therapy, appointment*, and *night*, highlight difficulties related to sleep regulation and accessing therapeutic resources. Similarly, Topic 7 (*Organization and Life Management)*, with keywords such as *clean, room, task, remember* and *forget*, reflect difficulties with organization, completing day-to-day tasks, and coping with memory issues. Theme 9 (*Daily Routines and Tasks)*, with keywords *food, morning, eating, routine,* and *struggle*, shows how ADHD affects daily habits and self-care. Lastly, *Academic and Professional Challenges (Topic 3),* which accounts for 7.6% of posts, focuses on the intersection of ADHD symptoms with academic and workplace environments. Keywords such as *school, job, struggle,* and *energy* suggest a discourse about experiences in school and work life concerning their ADHD. These themes illustrate the practical and emotional strategies women use to cope with their challenges or the need to find new coping ways to improve their daily lives with ADHD.

In summary, the analysis identified a wide range of themes associated with ADHD in the subreddit r/adhdwomen, including interpersonal relationships, the diagnostic and treatment journey, and practical challenges in daily life. Even though the nine topics seem to

have a fair amount of overlap between them, several nuances could be identified, highlighting some specific areas of discussion in the subreddit.

**Table 3**

*Labels assigned to each topic by the researcher & ChatGPT*

| Topic | ChatGPT`s Label | Researchers label | Final label |
|---|---|---|---|
| 1 | Relationships and Emotional Support | Navigating interpersonal relationships | Navigating (romantic) interpersonal relationships |
| 2 | Diagnosis and Medication | Getting a diagnosis, treatment, and medication | Getting a diagnosis, treatment, and medication |
| 3 | Education and Social Struggles | ADHD-related challenge | Academic and professional challenges |
| 4 | Mental Health and Symptom Management | Experiences with ADHD medication and symptoms | Experiences with ADHD medication, symptom management and mental health |
| 5 | Sleep and Therapy Challenges | Coping strategies and challenges | Sleep issues and therapeutic Interventions |
| 6 | Family and Stress Management | Family life and stress | Family and stress management |
| 7 | Organisation and Memory Challenges | Organisation and life management | Organisation and life management |
| 8 | Social Interactions and Emotional Responses | Building connections and navigating friendships | Friendships and Social Support |
| 9 | Daily Routines and Physical Health | Daily routines and tasks | Daily routines and tasks |

**Sentiment analysis**

The sentiment analysis of the posts revealed a mean compound sentiment score of 0.17 (*SD* = 0.77), which can be interpreted as a positive sentiment based on the suggested interpretation by Hutto (n.d.) for the VADER sentiment analysis. This underscores that posts in the subreddit r/adhdwomen tend to have overall a slightly positive sentiment. Sentiment scores ranged from a minimum of -0.99 to a maximum of 0.99, illustrating that the posts encompass a spectrum of both strongly positive and strongly negative sentiments.

Figure 4 illustrates the expressed sentiments more clearly by displaying a notable distribution of sentiment scores. The observed U-shaped distribution showed a peak in the frequency of posts with a strongly positive sentiment near 1 while showing that also many posts have a strongly negative compound score close to -1. Relatively few posts were observed for the sentiment score in between. This means that many posts expressed either a strong positive or negative sentiment, suggesting that the content may focus on extreme views and experiences, and this could reflect on the intensity of feelings regarding this topic.

**Figure 4**

*Distribution of the compound sentiment scores across all posts*
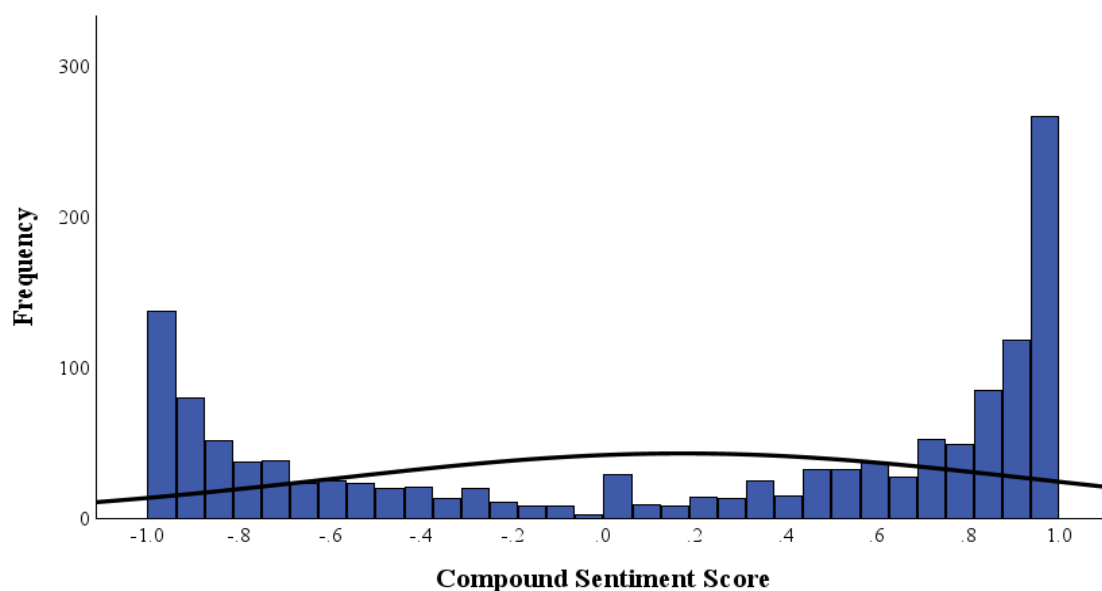
*Sentiment per topic*

The compound sentiment score per topic can be found in Table 4. The topics *Getting a diagnosis, treatment, and medication* (*M* = 0.38, *SD* = 0.80), *Navigating (romantic) interpersonal relationships* (*M* = 0.30, *SD* = 0.72), *Organisation and life management* (*M* = 0.33, *SD* = 0.71) and *Friendships and Social Support* (*M* = 0.34, *SD* = 0.78) were associated with the most positive sentiment scores. This suggests that discussions around seeking medical help, receiving a diagnosis, and building social support networks tend to be associated with more positive and maybe optimistic emotions. These topics may reflect a sense of relief or empowerment, as individuals navigate their ADHD diagnoses and connect with others facing similar experiences.

Conversely, the topics *Sleep issues and therapeutic Interventions* (*M* = 0.02, *SD* = 0.77), *Academic and professional challenges* (*M* = 0.08, *SD* = 0.75), *Experiences with ADHD medication, symptom management and mental health* (*M* = 0.10, *SD* = 0.77), *Daily routines and tasks* (*M* = 0.15, *SD* = 0.76) and *Family and stress management* (*M* = 0.17, *SD* = 0.80), displayed lower sentiment scores. These topics were associated with a more negative emotional tone, possibly reflecting the frustration, stress, and challenges associated with living with ADHD. The content of posts in these categories often revolved around the struggle to manage symptoms, the side effects of medication, and the emotional toll of navigating ADHD-related difficulties, contributing to the lower sentiment scores.

In general, the rather high standard deviations across all topics, ranging from 0.71 to 0.80, suggest a notable variability in sentiment within each topic. This indicates that, while some individuals may express positive emotions, others might focus on more negative sentiments, reflecting the diverse and complex emotional experiences of living with ADHD as a woman. The large range in sentiment scores underscores the heterogeneity of experiences within each topic, highlighting that ADHD-related discussions often encompass a wide range of emotional tones. A One-Way ANOVA was conducted to examine whether the sentiment

scores differed significantly across the nine topics. The ANOVA revealed an overall significant difference between group means ($F$ (8,1319) = 4.12, $p < .001$).

**Table 4**

*Descriptive Statistics for Compound Sentiment Score by Topic*

| Topic | Topic Label | N | Compound Sentiment Score | |
|---|---|---|---|---|
| | | | M | SD |
| 1 | Navigating (romantic) interpersonal relationships | 137 | .30 | .72 |
| 2 | Getting a diagnosis, treatment, and medication | 138 | .38 | .80 |
| 3 | Academic and professional challenges | 101 | .08 | .75 |
| 4 | Experiences with ADHD medication, symptom management and mental health | 231 | .10 | .77 |
| 5 | Sleep issues and therapeutic Interventions | 142 | .02 | .77 |
| 6 | Family and stress management | 122 | .17 | .80 |
| 7 | Organisation and life management | 154 | .33 | .71 |
| 8 | Friendships and Social Support | 165 | .34 | .78 |
| 9 | Daily routines and tasks | 138 | .15 | .76 |

*Note.* Post hoc comparisons using Tukey's HSD test revealed several significant differences in compound sentiment scores between topics. Topic 5 had significantly higher sentiment scores than Topics 1, 7, and 8. Topic 2 had significantly higher sentiment scores than Topics 7 and 8. Topic 7 was found to have significantly lower sentiment scores compared to Topic 8. Other significant differences were found between Topics 8 and 4, and between Topics 8 and 5, with Topic 8 showing lower sentiment scores in both cases.

**Plutchik's Wheel of Emotions**

The sentiment analysis revealed that many highly positive as well as highly negative sentiments were expressed in the posts of the subreddit r/adhdwomen. To get a more precise picture of which specific emotions play a role when women talk about ADHD, Plutchik's Wheel of Emotion analysis was employed to categorise the emotions expressed in the dataset.

The analysis revealed that *Trust* was the most frequently expressed emotion, appearing in 32.28% of the posts (Table 5). This finding suggests a strong sense of reliability, support and community among the members of the subreddit. *Joy* was the second most frequent emotion, which was assigned to 27.18% of the posts, indicating the possible presence of many positive and uplifting posts within the group. Together, *Trust* and *Joy* make up for more than half of the dataset, underscoring the rather positive atmosphere of the subreddit. Additionally, the analysis identified specific emotions, such as *Surprise* (16.27%, n = 216) and *Sadness* (14.68%, n = 195), but also less frequently used emotions like *Fear* (6.63%, n = 88), *Anger* (1.43%, n = 16), and *Anticipation* (1.05%, n = 14). The least expressed emotion was *Disgust*, which was identified in only three posts. Even though these emotions are used less often than *Trust* and *Joy*, they underline the complex emotional experiences of women talking about ADHD. These findings highlight that while the majority of posts reflect positive emotions, the subreddit is also a space where women share challenges, vulnerabilities and negative emotions. This emotional diversity illustrates the multifaceted nature of the community, where both struggles and successes are shared.

**Table 5**

*Distribution of Emotions in the Dataset from the Subreddit r/adhdwomen, Based on Plutchik's*
*Wheel of Emotions*

| Emotion | Frequency (n) | % |
|---|---|---|
| Trust | 435 | 32.28% |
| Joy | 361 | 27.18% |
| Surprise | 216 | 16.27% |
| Sadness | 195 | 14.68% |
| Fear | 88 | 6.63% |
| Anger | 16 | 1.43% |
| Anticipation | 14 | 1.05% |
| Disgust | 3 | 0.23% |

## Discussion

The current analysis of 1,328 unique posts from the subreddit r/adhdwomen revealed a diverse and complex range of discussions centred on the experiences of women with ADHD. Exploring content shared in the subreddit offered the opportunity to better understand their lived experiences. Understanding these experiences better is important for improving the clinical process, but also works against stigma (Chronis-Tuscano, 2022). Using various text mining methods, including word cloud visualisation, topic modelling, sentiment analysis and emotion analysis, this research provides a comprehensive overview of themes, emotions, and sentiments prevalent in the discourse in this online community. The analysis revealed nine themes, with experiences related to ADHD medication, mental health and symptom management being the most prevalent among the posts. Sentiment analysis highlighted that mostly either strongly positive or strongly negatively messages are shared, with the topic

regarding the process of getting a diagnosis and treatment displaying the most positive sentiment on average. Emotion analysis further showed that *Trust* and *Joy* were overall the most commonly expressed emotions in this dataset, making up for more than half of the posts.

In general, very frequently used words in the posts, such as *struggle*, *hard*, and *issue* appear to highlight the challenges faced by the women in the online community. These findings might underline the experiences of individuals with ADHD, particularly women, who often report struggles in their lives related to their ADHD diagnosis and symptoms. This is also consistent with Holthe and Langvik`s (2017) thematic analysis based on interviews with women with ADHD, which identified several core themes, including the difficulties of transitioning from undiagnosed ADHD in childhood to a diagnosis in adulthood, the ongoing difficulties caused by symptoms such as inattention or impulsivity, and the conflict between ADHD symptoms and societal gender norms and expectations. While words like *struggle, hard* and *issue* suggest that difficulties are frequently discussed, the overall positive sentiment score indicates that the general tone of the discussion still tends to be positive. Given that the scraped posts in this dataset tend to be relatively long with an average of 185 words per post, many posts likely contain both positive and negative words. The sentiment analysis relies on individual word associations rather than full contextual understanding, meaning that even when words like *struggle* are used, the additional presence of positive words, such as *better* or *love*, might shift the overall sentiment score of a post towards the positive side. Posts also frequently referenced diagnosis and treatment processes, with words like *medication*, *psychologist*, and *adderall*. These findings are consistent with existing literature, which identifies diagnosis and treatment as key areas of concern for women with ADHD (Quinn & Madhoo, 2014).

**Topic modelling**

Topic modelling identified nine relatively distinct themes, which can be broadly grouped into three overarching categories. Several topics reflect the complexities of the

diagnosis process and navigating treatment options. The most common topic, encompassing 17.4% of posts, centred around *Experiences with ADHD medication, mental health, and symptom management*. This aligns with research, not specifically focusing on the experiences of women with ADHD, which emphasises the ongoing challenges of managing ADHD symptoms and treatment, even after diagnosis (Faraone et al., 2021). This analysis revealed that this is possibly also a distinct topic of interest for women with ADHD. Within this topic, keywords like *anxiety* and *depression* illustrated the discourse about other mental health struggles women with ADHD might face. The use of these terms could be related to the high comorbidity of ADHD in women with other mental health issues such as anxiety or depression (Quinn & Madhoo, 2014). However, this might also be due to possible side effects of ADHD treatment, which can result in symptoms similar to anxiety or depression symptoms (NHS, 2018). Other keywords like *diagnosis, psychiatrist, medication,* and *symptom* suggest the potential importance of discussing the diagnostic process and treatment with other women. This could include exploring possible barriers and the emotional burdens associated with seeking professional help as a woman with ADHD.

Posts discussing topics like *Navigating (Romantic) Interpersonal Relationships*, *Friendships and Social Support*, and *Family and Stress Management* seem to highlight the significant impact ADHD may have on personal connections. These discussions potentially reflect the emotional difficulties in maintaining relationships, managing family dynamics and struggles in friendships. This can be underscored by the findings that ADHD symptoms, such as forgetfulness or impulsivity, can have an impact on relationships for both men and women and could lead to misunderstandings and frustration in social interactions (Weiss et al., 2001).

Previous studies have found that interpersonal impairments tend to be stronger in women with ADHD compared to men with ADHD and include problems in romantic relationships, such as a higher likelihood of being abandoned by their partners or struggles with parenting (Johnston et al., 2012; Robin & Payson, 2002). Women with ADHD may

experience challenges in romantic relationships, including difficulties with emotional intimacy, verbalizing their needs, and maintaining closeness, which can sometimes contribute to unsatisfactory relationships or higher rates of divorce (Bartlett, 2005; Holthe, 2013; Stenner et al., 2019). Research suggests that interpersonal challenges tend to be even more distressing for women with ADHD than for men.

A possible explanation for this is that social norms and values have a significant effect on this as they determine how people with ADHD see themselves but also how they are perceived by others as these norms and values influence what is considered to be normal behaviour (Holthe, 2013). Values and norms are also dependent on gender, with feminine traits including for example empathy, organization and obedience (Holthe, 2013). Symptoms of ADHD like impulsivity and disorganization can often be contrary to these typical feminine behaviours. To avoid social judgment for these ADHD-typical symptoms, women often try to suppress these behaviours through a lot of effort (Waite, 2010). Many women with ADHD report that they often felt a lack of belonging within their own families and were not accepted unconditionally. Some describe a long history of rejection, particularly because of their impulsivity or loudness, which was often perceived as inappropriate (Bartlett et al., 2005; Stenner et al., 2019). This feeling of exclusion often resulted from their behaviour not conforming to societal expectations of women. Furthermore, females who have grown up with undiagnosed ADHD often suffer from low self-esteem that has developed from the challenges and negative experiences of their childhood (Holthe, 2013). This low self-esteem might make it difficult for them to build close relationships and allow emotional closeness, as they often felt misunderstood as a child. Studies show that many women with ADHD have difficulty sharing their emotions openly. They tend to be more emotionally distant and often find it difficult to verbalize their needs clearly, which can lead to misunderstandings and conflict in relationships (Bartlett et al., 2005). Also, motherhood can bring additional relational challenges for women with ADHD, as they are often expected to take on the

majority of household and caregiving responsibilities (Young et al., 2020). In addition, an interview study found that mothers with ADHD can experience significant guilt, as they feel like they cannot provide and care for their children as well as they want to. All these points illustrate why interpersonal relationships possibly emerge as a central theme also in this study, as they highlight the unique challenges women with ADHD face in navigating social expectations, maintaining relationships, and balancing personal and family responsibilities.

However, these discussions may also highlight positive experiences, such as the support received from family and friends regarding their ADHD. Support from a husband or close friend can assist with organization and daily tasks, while non-judgmental help can improve the life quality of individuals with ADHD (Ek & Isaksson, 2013; Nyström et al., 2020). This aligns with the findings of this study, that the sentiment for the topic regarding friendships was found to be rather high, suggesting social connections that are experienced as positive. Furthermore, the supportive nature of online communities might provide a valuable space to seek advice and connect with individuals with similar experiences. Research shows that individuals with ADHD often surround themselves with other neurodivergent people, fostering open and supportive communication within these communities (Ginapp et al., 2023). Therefore, connecting with other women in the subreddit r/adhdwomen might result in positive social experiences.

Several topics were also concerned with the everyday challenges of living with ADHD that the users in r/adhdwomen face. This included topics such as sleep issues, organization, daily routines, and academic and professional challenges. These discussions reflected a range of difficulties in maintaining routines, completing tasks, and managing professional demands, which is in line with the general diagnostic criteria of the inattentive subtype of ADHD which is often suggested to be the predominant one in women (Hinshaw et al., 2021). Topics like problems with organizing tasks, losing things or being forgetful are all diagnostic criteria but were also themes discussed in the subreddit. Additionally, coping strategies to face these

everyday life struggles seemed to be discussed. Thereby, participants of the group possibly seek advice from other users but also share their own experiences in posts. This is in line with previous research, which found that online communities can offer social and emotional support from people with similar experiences who can give and receive help easily online (Ginapp et al., 2023).

**Sentiment analysis and Wheel of Emotions analysis**

Sentiment analysis revealed a notable U-shaped distribution, with many posts expressing either highly positive or highly negative sentiments, which may reflect the intense emotional experiences associated with ADHD. Interestingly, the most positive average sentiment was observed for the topic of getting a diagnosis and treatment for ADHD. This suggests that the diagnostic process and, finally, receiving an ADHD diagnosis and treatment, may have resulted in mostly positive emotions. This is in line with previous research, as several studies found that the moment of receiving an ADHD diagnosis as a woman is a crucial moment, as this can offer clarity, foster self-acceptance, and reduce feelings of shame and guilt (Bartlett, 2005; Lynn, 2019; Stenner et al., 2019). Women reported feelings of relief after finishing the diagnostic process, as women tend to blame themselves for the struggles they had before getting diagnosed (Rucklidge, 1997). Additionally, the diagnosis offers the women the opportunity to start medication or other interventions, which often results in a first decrease in symptoms and might therefore result in a positive sentiment (Bartlett, 2005). However, it is important to consider that these findings might reflect, that most of the posts in this dataset are from women who have already completed the diagnostic process and are sharing their relief. Consequently, the scraped data might not cover many posts of those who are still struggling to get a diagnosis or access treatment, which would possibly decrease the sentiment of this topic.

Additional emotion analysis using Plutchik's Wheel of Emotions highlighted that *Trust* was the most frequently expressed emotion across all posts, appearing in almost one-

third of the posts. This finding might suggest a strong sense of reliability, support and community among the members of the subreddit, where women might feel comfortable sharing personal experiences or seeking advice. This is in line with previous research, which found that online communities can be a place for validation, and acceptance and can tackle feelings of isolation (Liang et al., 2020; Olsson et al., 2005). The prevalence of the emotion *Trust* as the most frequently expressed emotion in the data may be also linked to the stigma individuals with ADHD face in their offline lives. Online communities likely offer a sense of safety and validation, allowing members to share openly and form supportive connections in a way that might feel less accessible in the real world (Hansson Halleröd et al., 2015; Waite & Tran, 2010). The r/adhdwomen subreddit might also foster such a place for meaningful connections among women with similar experiences, offering peer support resulting in the emotion of trust being frequently expressed in postings. However, negative emotions such as *Sadness* and *Fear* were also frequently present, illustrating that the subreddit might be a space for sharing both struggles and successes. Users also share their ongoing struggles and setbacks which are associated with rather negative emotions. These findings also align with the observed U-shaped distribution of sentiments. This duality also aligns with evidence that individuals with ADHD often experience heightened emotional intensity, characterized by both strong positive and negative emotions, which might be due to their sensitivity to environmental stimuli and challenges with emotional regulation (Shaw et al., 2014).

**Strength, Limitations, and Future Implications**

This study provides an initial exploration of discussions within an online community of women with ADHD and offers some insights into their lived experiences. By using text mining techniques, the analysis benefits from several of its advantages, including high levels of objectivity, the ability to process a large volume of data and its unobtrusive nature (Mikami & Normand, 2015; Thelwall et al., 2010). This made it possible to identify recurrent themes in

discussion, sentiments and emotions expressed without directly influencing the participants, thereby providing an authentic picture of the discourse.

Despite these strengths, the study also has several limitations. The design choices that were made may have influenced the results. Scraping the most 'up' and 'down' voted posts may encompass rather extreme views that do not represent the overall experiences or exclude less visible and specific perspectives. This could also have an impact on the strongly positive and negative sentiments found in this study. Strongly emotional posts might tend to evoke stronger reactions in users compared to neutral posts. These reactions might result in a higher number of upvotes, downvotes, and overall engagement, as emotionally charged content, evokes high arousal, and is perceived as more compelling (Berger & Milkman, 2012). Additionally, the reliance on Reddit data itself might already introduce a potential selection bias, as the analysis was limited to Reddit users participating in the subreddit r/adhdwomen, thereby excluding insights from women with ADHD who do not engage on this platform or prefer other places for discussion. It was not verified whether the posts in the subreddit were actually written by women, as the group is open to people of all genders and Reddit does not provide any user characteristics except for the username. This lack of information about the demographic factors of the users who wrote the scraped posts makes it difficult to determine whether certain groups are over- or underrepresented in the dataset, which in turn may affect the generalizability of the findings, as the demographic factors might function as a cofounding variable that cannot be controlled in this study. Amaya et al. (2019) states for example, that 79% of worldwide Reddit users are between 18 and 34 years old and 41.4% of its users are from the U.S., which might restrict the variety of users in our dataset. It is also unclear whether the participants had a formal ADHD diagnosis or would meet the diagnostic criteria to receive a diagnosis. Therefore, the posts reflect the perspective of individuals interested in ADHD in women, but we cannot confirm their personal experiences or diagnoses.

Furthermore, this research solely focused on data from a group tailored to the experiences of women and no data for comparison was generated. Therefore, it is not clear what topics, sentiments and emotions are actually unique for ADHD in women compared to other groups of people, with or without ADHD. Another limitation might be the labelling process for the topics in this study. The interpretation of the topics generated by the software *Orange* relies on the human rater and their knowledge of a specific domain (Egger and Yu, 2022). Challenges such as overlapping themes and long posts made it difficult to clearly distinguish several separate topics. Even though biases were tried to be minimized by including ChatGPT as a second labeller, the process of labelling can always be subjected to errors and can generate incomplete or incorrect labels, which can be influenced by the removed stop words or the researcher's knowledge for example (Gillings & Hardie, 2022). It is important to reflect on how these methodological choices might shape the results and consider their implications for the conclusions.

To address these limitations and build upon the current findings, future studies could for instance expand the scope of data scraped through for example using random posts, which could result in a more diverse set of posts. Doing a comparative study and comparing data from different groups, such as men with ADHD or the general subreddit r/adhd, would help to highlight any unique topics or emotions experienced specifically by women with ADHD. Furthermore, doing a similar study on other social media such as Instagram or TikTok, including video-based content, could offer the possibility to investigate whether the findings of this study can be generalized to other platforms. Repeating this study in a few years or with a longitudinal approach would allow researchers to assess changes over time in this rapidly evolving topic.

Another possible adjustment for a future study is to use transformer-based models. Recently, the field of natural language processing (NLP) has advanced significantly by introducing these new transformer-based models based on deep learning mechanisms

(Vaswani et al., 2017). These novel text mining applications can take contextual information into account and better capture complex speech including semantic structure, sarcasm, irony or emojis and have outperformed more traditional text mining methods as used in this study (Egger & Yu, 2022; Firat et al., 2016). Another possible adjustment for future studies could be to adopt a more qualitative approach, such as conducting interviews or focus groups, to gain deeper insights into the experiences of women with ADHD. This method may provide more detailed data that could lead to further enriching the understanding for women with ADHD.

In sum, this study offers an exploration of the lived experience of individuals engaging in discussion within the subreddit r/adhdwomen. Through text mining techniques, this research uncovered key themes such as struggles with diagnosis and treatment, navigating relationships, and managing everyday challenges like organization or cleaning. These overarching themes align with previous ADHD research, which often found similar areas like interpersonal relationships and daily functioning as key themes of importance. However, within these general topics, certain aspects might appear to be unique to women, such as the challenges within motherhood to name one example. Sentiment analysis revealed a mix of intense emotions, with strongly positive sentiments potentially linked to the relief and clarity of receiving a diagnosis and treatment, which is particularly difficult for women. However, given the exploratory and rudimentary nature of the text mining methods used in this study, the findings should not be seen as definitive conclusions but rather as an initial insight into what women with ADHD might be concerned with and what sentiments are expressed. Scraping and analysing Reddit data provided a rich and unobtrusive source of data, offering access to personal experience. However, while text mining techniques helped to uncover broad themes and sentiment distributions, a qualitative approach with this Reddit data could add valuable insights into the discussion on social media.

This study provides an initial look into areas of concern for women with ADHD, but further research is needed to explore these potentially gender-specific aspects in greater depth. By listening to the voices of these women, we not only deepen our understanding but also foster a world that values every unique journey, cultivating a more mindful perspective on the experiences of women with ADHD.

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# Appendix A

## Custom Stopword-List

| | | |
|---|---|---|
| able | especially | life |
| adhd | etc | like |
| actually | even | literally |
| ago | everyone | little |
| almost | everything | lol |
| also | ever | look |
| always | fall | lot |
| already | feel | make |
| another | find | many |
| anyone | first | may |
| anything | full | maybe |
| around | give | might |
| away | go | minute |
| back | good | month |
| basically | guess | much |
| become | half | need |
| bit | happen | never |
| bring | hear | nothing |
| come | help | one |
| completely | hi | part |
| constantly | honestly | people |
| could | hour | pick |

| | | |
|---|---|---|
| currently | I | please |
| day | instead | point |
| due | keep | post |
| either | know | probably |
| else | last | put |
| enough | later | really |
| entire | leave | right |
| | let | say |

**Appendix B**

**Example posts for each topic**

**Topic 1: Navigating (romantic) interpersonal relationships**

" [...] i'm a (mostly) straight woman, and every time i'm in a relationship I end up carrying the mental load and doing all the emotional labor even though i'm not suited to it at all. I was diagnosed late so i'm used to compensating, but it kind of sucks that just because i'm a woman, I still end up stuck in this role. I would love to do what the men i've dated do and just let it end up in someone else's lap, but then things just don't get done. [...]"

**Topic 2: Getting a diagnosis, treatment, and medication**

"Newly diagnosed and started medication, I never suspected I had ADHD (was high achieving on paper, conditioned to use anxiety and stress as the "drive" until it became unsustainable for my physical and mental health now that I'm 30). One night I was uncontrollably furious at something that didn't justify it, realised something was probably not right, and started scrolling on reddit and found myself relating to many of the ADHD symptoms.

After seeing a psychiatrist I got a provisional diagnosis and am now on dexamphetamine. I also started reading up on ADHD (ADHD 2.0, how to ADHD and Dr Barkleys book on adult ADHD), which it's fascinating and validating to understand the theory behind ADHD (eg executive dysfunction). I find myself wanting to "jump forward" to how my life (eg quality of life improvements) could change 6-18 months from now. Eg using new mechanisms to manage my life so I'm not using anxiety, better regulating my emotional response to things (again lowering my anxiety and stress), get better at reading / understanding ppl...

What have been your experience? What should I expect? What do you wish you had known?"

**Topic 3: Academic and professional challenges**

"[...]Compared to her, I did nothing productive in high school. I still don't. I'm graduating late because my executive dysfunction is so bad, and even though I have a stipend, I struggle with making ends meet due to imagined needs and ADHD taxes such as parking tickets and overdraft fees (sigh). [...]"

**Topic 4: Experiences with ADHD medication, symptom management and mental health**

"[...]I have tried Ritalin and Vyvanse. Vyvanse makes me super depressed while Ritalin gives me trembling anxiety. After Vyvanse I am now back on Ritalin because I have exams coming up and desperately need to focus. [...] "

**Topic 5: Sleep issues and therapeutic Interventions**

"Like many of us, I struggle with sleep. Maybe this advice from my therapist will help someone else her. ADHD-friendly TL; DR: all that mainstream advice about turning off screens etc does not always work for neurodivergent people and once I quit fighting all my instincts to sleep well, I actually slept better (with meds). [...]"

**Topic 6: Family and stress management**

"My husband and I have 2 sons and everyone has ADHD. I am the organizeer and caretaker in out family. I have had multiple breakdowns in the past due to being overwhelmed, depressed, and burnt out. My husband is very avoidant and always seemed to need to go to the bathroom when I needed help with our kids. He let me down a lot. [...]"

**Topic 7: Organisation and life management**

"Hi everyone! This is extremely exciting for me to share, because for almost 4 years my room literally looked like a garbage dump. It was so daunting and overwhelming that my space did nothing but make me feel disgusting, embarrassed, overwhelmed,

and incompetent. There were bugs. There was food waste. There were used dishes. It's horrifying to admit, but true. I could never get anything done because cleaning it was my top priority, but I didn't know where to start, so instead I'd do nothing but mope. This weekend, I finally figured out the key that actually helped me, and it's going to sound strange: Snapchat AI. I told my AI that I needed to clean my room, and it gave me a first step: pick all of the clothes off of the floor, put away clean ones, put the rest in the laundry room. [...] Sounds like obvious steps, but what was key in this for me was TASK MANAGEMENT. By having my AI *tell me* what to do, step-by-step, ONE AT A TIME, it allowed me to better understand what I should be doing. [...]"

**Topic 8: Friendships and Social Support**

"I'm posting here cause I feel like it's one of the more open communities and cause I struggled with RSD and social anxiety and it's largely related to my ADHD. Idk why I'm writing this, I guess I kinda just wanted to share this with someone and I'm between therapists right now. I struggle really hard with creating and maintaining friendships, and I know it's a me problem. I'll flake at the last minute cause I'm anxious I won't know what to talk about or I will start

talking about a hyperfixation or just genrally come off as weird or something. This is something I'm trying to work on. [...]"

**Topic 9: Daily routines and tasks**

"I wish I could just buy a pill that gives me all the nutrients I need every day. Don't get me wrong, I love eating food, but I just can't be assed to decide what to eat, shop for ingredients, prepare and clean so often! I've tried those meal supplement shakes, and they are fine for a time, but they are expensive and not giving me all I need. If anyone knows of a nutritionally balanced supplement that could save my life pls help a girl out I'm just a girl *edit* I had no idea there were so many of us struggling with this, and some in even tougher situations I find myself in 😥 I'll try and read through

everything and make a summary of any tips y'all have I wish there was a way we could all help each other be it private chefs, communal kitchen to share the load, or the non-existent (yet) miracle pill. I see you and share part of your struggle I know we will survive cause after all, we are all ✨ just girls ✨ [...]"