MSc in Clinical Psychology

Department of Psychology

Gender differences in comorbid disorders and quality of life of adults diagnosed with ADHD

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Forewords and acknowledgments

Submitted in partial fulfilment of the requirements of the MSc Clinical Psychology degree, Reykjavik University, this thesis is presented in the style of an article for submission to a peer-reviewed journal.

This thesis was carried out over the course of three semesters. During the first semester, a literature review was written about ADHD as well as the application to the Ethics committee of medical research of The National University Hospital of Iceland (Landspítali) and The Scientific Research Committee for medical research at The National University Hospital of Iceland. During the second semester, a first draft of the method section for the thesis was written. During the third semester, collection of data took place as well as data analysis and writing the final draft for the thesis. The main goal of this study is to examine gender differences in comorbid psychiatric disorders, previous difficulties, and self-reported quality of life of adults diagnosed with ADHD. The aim is to continue working on this article and to submit it for publication in a peer-reviewed journal. Unnur Jakobsdóttir Smári and Jón Friðrik Sigurðson will be co-authors of the article. I would like to thank my supervisors Unnur Jakobsdóttir Smári and Jón Friðrik Sigurðson for their guidance and support throughout this work. I would also like to give my gratitude to my family and friends for their support, encouragement and for their believe in me every step of the way. Last, but not least, I want to give my deepest gratitude to my husband and four daughters for their endless support, patience, and encouragement in difficult and stressful times during my studies. My daughters inspired my interest in ADHD and gender differences and therefore I dedicate this work to them.

Abstract

Attention-deficit/hyperactivity disorder (ADHD) is a complex neurodevelopmental condition that can cause significant impairments in daily life. Often, people are diagnosed with other psychiatric problems at the time of their ADHD diagnoses, or before. ADHD symptoms and comorbid disorders can affect the quality of life of those who have it. The aim of the current study was to provide insight into gender differences in comorbid psychiatric disorders in adults with ADHD as well as differences in their self-reported quality of life. **Methods:** The medical records and referral notes of 1001 patients, who were assessed for ADHD at the ADHD clinic at Landspítali-The National University Hospital of Iceland between 2013 and 2021, were obtained and analysed. Background information, ICD-10 diagnoses, and scores on psychological scales (ADHD rating scale, The Depression Anxiety Stress Scales, and The Adult ADHD Quality of Life Scale) were obtained and analysed. **Results** showed that women are more likely to have suffered from depression and anxiety prior to their ADHD diagnosis. Results also showed that females are more likely to be diagnosed with anxiety disorders and experience more stress at the time of their ADHD diagnosis, than their male counterparts. There was not a significant gender difference in the frequency of other psychiatric disorders at the time of the ADHD diagnosis. The results also showed that females are more likely to report lower quality of life and that higher scores on the ADHD rating scale were correlated with lower self-reported quality of life. **Conclusions:** These findings show that there is indeed a gender difference in comorbid and previous psychiatric difficulties for those who suffer from ADHD. The findings also show that ADHD symptoms are related to self-reported quality of life. It is important to continue studies in

this field so that those suffering from ADHD can be detected and diagnosed earlier, to increase

their quality of life and to prevent and treat other disorders.

Keywords: ADHD, Gender difference, comorbid disorders, quality of life.

Attention-deficit/hyperactivity disorder (ADHD) is a complex neurodevelopmental condition described in diagnostic classification systems (ICD-10, DSM-5) (American Psychiatric Association, 2013; World health Organization, 2004). It is characterized by two subdomains: inattention and hyperactivity-impulsivity. The symptoms of ADHD can appear in many forms, but the main symptoms are inattention, hyperactivity, and impulsivity (Parekh, 2017).

The prevalence rate of ADHD according to APA (2021) is around 8.4% in children and 2.5% in adults. ADHD is most frequently diagnosed in school-aged children who are referred because of disruptive behaviour in the classroom or because of difficulties with schoolwork (Parekh, 2017). ADHD used to be recognized as a childhood disorder and it was believed that people would outgrow their symptoms in adolescence, and that ADHD would be non-existent in adults. Today, however, it is acknowledged that the symptoms of ADHD continue to be impairing throughout adolescence and are often still impairing in adulthood (Barkley et al., 2002; Rasmussen & Levander, 2009).

ADHD symptoms are prevalent over time, apparent across situations and cause significant impairment in daily life. A diagnosis is based on current symptoms that have been present over a six-month period, but several symptoms must have been present prior to the age of 12 (Asherson, 2012; Parekh, 2017; Young et al., 2020). Emotional lability and emotional dysregulation are frequently accompanied with ADHD in children and adults. Impaired executive functioning is common and affects people's ability to handle daily life (Rucklidge, 2010; Young, et al. 2020).

Adults with ADHD struggle in different areas of functioning, such as negative self-image, less coping strategies, lower self-esteem, and a negative attitude towards the future. It is

not well known if these problems are as frequently reported in the adults with ADHD who have

received treatment (Rucklidge, 2010), so it is very important to continue research in this field.

ADHD and gender differences

ADHD is more frequently diagnosed in males than females during childhood and adolescence.

The ratio varies from 2:1 to 10:1 (DSM-IV, 2000; Mowlem et al., 2019). Evidence indicates that

ADHD is more prevalent in females than is reflected in clinical practice (Biederman et al., 2004;

Mowlem et al., 2019).

Many studies have shown a difference in untreated ADHD symptoms between males and

females. Girls with ADHD seem to be more likely to have less symptoms of hyperactivity

(externalizing symptoms) and more symptoms of mood and anxiety problems than boys with

ADHD (internalizing symptoms) (Carlson & Gaube, 1997; Gershon & Gershon, 2002).

However, boys with ADHD tend to have more symptoms of hyperactivity and conduct disorder

than girls with ADHD. Adult males with ADHD show more externalizing behaviour such as

violence, criminality and difficulties keeping jobs than their female counterparts (Rasmussen &

Lavender, 2009). Both healthcare and social systems seem to be better adjusted to identify and

treat ADHD when exhibited with behavioural and external problems. Those symptoms, as stated

before, are more common in boys than girls with ADHD and contributes to the fact that girls

seem to be underdiagnosed with ADHD, except when they show more obvious externalizing

problems (Mowlem et al., 2019; Gudjonsson et al., 2009). Women with ADHD are also more

likely to begin sexual activities earlier than women without ADHD and tend to have more sexual

partners than women without ADHD, which can lead to early pregnancy or sexually transmitted

infections. Social problems for women with ADHD can arise from social stigma and unsafe

sexual behaviour, and they can be at risk of being victimized, bullied, harassed, abused, or

entering unhealthy relationships. Therefore, it is important to understand these differences in symptoms between males and females. It is important to detect, assess and treat females with ADHD, which hopefully leads to better long-term outcomes for them and better quality of life (Young et al., 2020).

In the last decades there has been growing evidence that gender difference in the actual prevalence of ADHD is not as prominent as once was thought (DSM-IV, 2000; London & Landes, 2021). Some research on adults has shown a more balanced gender distribution where gender difference in prevalence is modest or even non-existent (Biederman et al., 2004; Mowlem et al., 2019). It is important to understand that there is a high risk that girls who have ADHD, but are not diagnosed and treated, have symptoms which can affect their social, educational, and mental health outcomes negatively (Biederman et al., 2004; Mowlem et al., 2019).

ADHD and comorbid disorders

Psychiatric comorbidities are common in ADHD, e.g., depression, bipolar disorder, anxiety, obsessive-compulsive disorder, substance use disorder, personality disorders, eating disorders and learning disabilities. Research has shown that up to three-quarters of individuals with ADHD in a clinical population have one or more comorbid disorders (Davidson, 2008). These results were supported in a study by Ómarsdóttir et al. (2021) where a third of the individuals who were diagnosed with ADHD as adults, met the criteria for at least two other psychiatric disorders. Psychiatric comorbidities can make the diagnosis of ADHD difficult. Differential diagnosis can be challenging due to common features in ADHD and other psychiatric disorders (Searight et al., 2000). Comorbid disorders can have an impact on compliance and response to treatment for people with ADHD. However, it is possible to gain better clinical outcomes by treating ADHD in adults compared to treating the comorbid disorder solely (Ginsberg et al., 2014).

For females especially, there is a risk of comorbid disorders like depression, emotional lability, or anxiety to be misinterpreted as a primary condition instead of ADHD (Young et al., 2020). Women diagnosed with ADHD as adults more often have history of depression and anxiety than those without ADHD (Rucklidge & Kaplan., 1997).

It has been shown that adults with ADHD are at a higher risk of a substance use disorder, though some studies have shown that the prevalence is higher for males than females (Biederman et al., 2004). In Ottosen´s et al., (2016) study there was no gender difference either in prevalence or severity of substance use, among individuals with ADHD. It is noteworthy, that in some studies of substance use disorder in people with ADHD, most of the participants were unmedicated for ADHD. The rate of substance use appeared to be much higher for those who had never been treated with medication for ADHD, than for those who had been treated pharmacologically (Yule et al., 2017).

According to Biederman, Newcorn and Sprich (1991) and Biederman et al. (1993) females with ADHD have a lower prevalence of behavioural disorders and antisocial personality disorders than males with ADHD. Both adult males and females with ADHD have a higher prevalence of personality disorders than the general population. According to Young et al. (2020) and Stepp et al. (2012), women with hyperactive/impulsive symptoms are more likely to show more traits of borderline personality disorder with self-harming behaviours. Women with ADHD also seem to be at higher risk for negative outcomes in life such as more mental health impairment, mental illness, and are at higher risk of being admitted to in-patient psychiatric hospitals as adults compared to other women and to men with ADHD (Dalsgaard et al., 2002).

The hyperactivity and impulsivity symptoms appear more in the form of social, relational, and psychosexual problems and behaviours in girls than in boys with ADHD (Young

et al., 2020). Females with ADHD appear to find it more difficult to associate in interpersonal

relationships than their peers who do not have ADHD, which can prevent them from developing

and keeping a positive social network or accessing peer support. ADHD symptoms and

emotional difficulties in females appear to be related to weaker coping strategies and less

satisfaction with life (Gudjonsson et al, 2009).

Studies indicate that eating disorders (anorexia nervosa, bulimia nervosa and binge eating

disorder) are associated with ADHD in both genders (Nazar et al., 2016). There is also evidence

suggesting that there is a higher risk of obesity both for adults and children with ADHD,

regardless of gender (Brewerton & Duncan, 2016; Cortese et al., 2016).

It has also been shown that people with ADHD have often worse job prospects and lower

income than others (Ginsberg et al., 2014). This can influence people's quality of life.

There is some evidence that ADHD in adults is negatively associated with life

satisfaction. In a study by Gudjonsson et al. (2009) on Icelandic students, results indicated that

the best predictor of dissatisfaction with life in males was poor social function, and alternatively,

poor emotional control was the best predictor for females with ADHD.

The main goal of this study is to examine gender differences in comorbid psychiatric

disorders and self-reported quality of life of adults diagnosed with ADHD. The four main

hypotheses are:

Hypothesis 1. Females are more likely to be diagnosed with comorbid depressive and anxiety

disorders, both prior to the diagnosis and at the time of their ADHD diagnosis, than males.

Hypothesis 2. Females, diagnosed with ADHD, report higher scores on the DASS scale than

males.

Hypothesis 3. Females are more likely to report lower quality of life, measured with the AAQoL, than males, and higher age at the time of ADHD diagnosis is related to lower self-reported quality of life.

Hypothesis 4. More severe ADHD symptoms, measured with scores on the ADHD rating scale, are correlated with lower self-reported quality of life, measured with the AAQoL.

Method

Participants

Data, obtained from medical records of 1001 adults; 523 males and 478 females, who were assessed for ADHD at the ADHD clinic at Landspítali-The National University Hospital of Iceland between 2013 and 2021 were analysed in this study. All the participants had been screened for ADHD symptoms prior to assessment. Excluded were those who did not meet the criteria for ADHD according to ICD-10 after screening and assessment. Mean age of the participants was 30.8 years (SD=9.2, range 18-64), females mean age 29.8 (SD = 8.6, range 18-62) and males mean age 31.8 (SD = 9.6, range 18-64).

Measures

The ADHD rating scale (ADHD-RS, Magnússon et al., 2006) is an 18 item self-report scale. The scale evaluates attention-deficit and hyperactivity/impulsivity in adults over the previous 6 months, and in childhood between the ages of 5 and 12. Four versions of the scale were used: Self-report of current symptoms, self-report of childhood symptoms, informant report of current symptoms and informant report of childhood symptoms. Each item is scored on a 4-point Likert scale (0 = never/rarely, and 3 = very often). A higher score indicates more severe symptoms of ADHD. T-scores over 60-65 on each subscale indicate ADHD. In this study, the scale was divided into two subtypes: The Inattentive type, and Hyperactivity/Impulsivity. Studies have shown acceptable reliability (0.71-0.84) and validity of the scale (Zhang et al., 2005). The Icelandic version indicates good reliability and validity (Magnússon et al., 2006).

The Adult ADHD Quality of Life scale (AAQoL) is a self-report scale that evaluates the quality of life of adults with ADHD (Brod et al., 2006). It includes 29 items and focuses on 4 domains: Life productivity (lp, 11 items), psychological health (ph, 6 items), relationships (r, 5 items), and life outlook (lo, 7 items). Each item is scored on a 5-point Likert scale (0 = not at

all/never, and 4 = extremely/very often). Average score on the subscales is 42.9 for life

productivity, 52 for psychological health, 53.3 for relationship, 47.6 for life outlook and 47.7 for

the total score. A higher score indicates a higher degree of self-reported quality of life (Gjervan

& Nordahl., 2010). AAQoL has acceptable internal consistency (0.93 overall, 0.75-0.93 for

subscales) (Agarwal et al., 2012; Brod et al., 2015). Psychometric properties of the Icelandic

version have not been studied.

The Depression Anxiety Stress Scale (DASS) (Lovibond & Lovibond, 1995) is a self-

report scale which consists of 42 negative emotional symptoms. DASS is divided into three

subscales: depression, anxiety, and stress scales with an equal number of items on each scale.

The items are scored on a 4-point Likert scale (0 = never, and 3 = nearly always) that refers to

the experience of each symptom over the past week. Internal consistency is good (depression

0.91, anxiety 0.84 and stress 0.90) (Brown et al., 1997; Lovibond & Lovibond, 1995). The

Icelandic version shows acceptable validity and internal consistency (Smári et al., 2008).

The Mini International Neuropsychiatric Interview (MINI) is a short, diagnostic

structured interview with satisfactory psychometric properties to explore DSM-IV or ICD-10

criteria (Amorim, 2000; Lecrubier et al.,1997). Mini analysis 17 axis 1 diagnoses and the focus is

on the current diagnosis. Where it is clinically relevant, MINI also explore lifetime diagnoses

(Lecrubier et al., 1997). According to Sigurdsson´s (2008) study it has been shown that the

validity of the Icelandic version is promising. MINI was compared to the Composite

International Diagnostic Interview (CIDI), Patient Health Questionnaire (PHQ) and DASS in

depression and anxiety disorder diagnosis.

Procedure

The data for this study was obtained at Landspítali. Information was gathered from the patients‘

medical records and referral documents. The information included ICD-10 codes of present

diagnosis and comorbid diagnoses, mood disorders, anxiety disorders, personality disorders,

addiction disorders, tic disorder, age at diagnosis and gender, total scores, and T-scores on the

AAQoL, the DASS and the ADHD-RS. Referral documents also included previous psychiatric

problems like depression, anxiety, social problems, and other disorders either diagnosed by a GP,

psychologists or reported from the participants themselves. Those previous disorders were not

defined further in the referral documents.

The study was approved by The Ethics Committee of Medical Research of Landspítali

(Siðanefnd heilbrigðisrannsókna á Landspítala) (ref.no. 24/2021) and The Scientific Research

Committee for medical research at Landspítali (Vísindarannsóknanefnd heilbrigðisrannsókna á

heilbrigðissviði á Landspítala).

Statistical analysis

All data was entered in the IMB SPSS Statistics, version 27. First, descriptive statistics were

performed on the ADHD types and gender. Secondly, a Chi-square test was conducted to see if

there was a gender difference in the frequency of comorbid disorders in those diagnosed with

ADHD. Thirdly, an independent sample *t*-test was the fourth analysis that was conducted to see

if there was a difference in scores on depression, anxiety, or stress on the DASS. Independent

sample *t*-test was conducted to see if there was a gender difference in self-reported quality of

life, and ANOVA with Bonferroni post-hoc test was used to see if there was an age difference in

self-reported quality of life. Finally, Pearson correlation test was used to see if there was

correlation between low scores on AAQoL and high scores on ADHD rating scale. A

significance of $\alpha = 0.05$ as a criterion was used.

Results

Table 1 presents the number of participants diagnosed with each ADHD subtype (ADHD combined type, F90.0 and ADHD inattentive type, F90.8) by gender. Majority of the participants were diagnosed with the inattentive type. This did not differ substantially between genders, as is shown in Table 1.

Table 1.

Total number, ADHD subtype and gender of the subjects diagnosed with ADHD during 2013-2021.

	Male	Female
	n (%)	n (%)
ICD-10 ADHD diagnosis		
F90.0	168 (32%)	167 (35%)
F90.8	357 (68%)	311 (65%)
Total	523 (52%)	478 (48%)

Table 2 presents the mean and standard deviation on the ADHD rating scale by gender. Females report higher symptoms on hyperactivity/impulsivity subscales in all cases. There is a significant gender difference between all subscales except HI self-report adulthood. Males report more inattention symptoms than females do on all inattention subscales, except in self-report childhood.

Table 2.

Outcomes on ADHD rating scale after gender

	Male		Female		
	M	SD	M	SD	*t*-test
IA self-report childhood	70.81	8.0	71.84	8.2	-1.98*
HI self-report childhood	63.36	11.3	66.98	11.9	-4.9**
IA self-report adulthood	80.98	10.5	76.17	7.4	8.2**
Hi self-report adulthood	64.98	13.9	66.40	11.9	-1.70
IA informant childhood	79.20	15.6	76.21	10.5	8.37**
HI informant childhood	62.12	15.2	64.54	13.5	-2.18*
IA informant adulthood	78.20	13.1	70.94	11.6	3.70**
HI informant adulthood	60.71	14.3	62.74	15.1	-2.54**

Note: IA = inattention symptoms; HI = hyperactivity/impulsivity symptoms.
**$p < 0.01$,
*$p. < 0.05$

In this study 45.8% of the participants were diagnosed with at least one comorbid disorder at the time of the ADHD diagnosis (male=41%, female=50%). An overview of comorbid disorders at the time of the ADHD diagnosis and previous difficulties are presented in Table 3. There were no significant relationships between gender and comorbid depression diagnoses or other disorders. There was, however, a significant relationship between gender and anxiety diagnoses, where females with ADHD were more frequently diagnosed with anxiety disorders than males. For previously diagnosed difficulties there was a relationship between both depression and gender, and anxiety and gender, with women having a higher rate of both anxiety and depression before ADHD diagnosis. There was not a significant association between previous social problems and gender or other disorders and gender.

Table 3.

Comorbid disorders and previous psychiatric difficulties among people diagnosed with ADHD.

	Male	Female	Chi-square	
	n (%)	*n (%)*	χ^2	*p* -value
Current disorders				
Depression (F30-F39)	118(22.5)	123(25.7)	1.65	0.440
Anxiety(F40-F49)	127(24.3)	168(35.1)	14.46	<0.001
Other disorders (F01-F09,F10-F19,F20-F29,F50-F89)	50(0.1)	41(0.09)	0.40	0.818
Previous psychiatric difficulties				
Depression	229(43.8)	256(53.6)	10.32	0.006
Anxiety	240(45.9)	295(61.7)	25.99	<0.001
Social problems	80(15.3)	80(16.7)	0.56	0.756
Other disorders	75(14.3)	89(18.6)	3.49	0.175

There was a significant gender difference in anxiety and stress symptoms with females having higher scores than males as shown in Table 4. There was no significant difference in depressive symptoms between males and females.

Table 4.

Gender difference according to DASS score

	Male			Female			
	n	M	SD	n	M	SD	t-value
DASS							
Anxiety	477	9.60	7.47	418	11.51	8.93	3.48**
Depression	477	14.42	10.10	419	14.28	10.60	0.20
Stress	476	18.48	9.25	419	21.28	10.0	-4.36**

Note. M=Mean. SD=Standard deviation. **$p<.001$

Table 5 shows the mean scores, standard deviations, and *t*-values for all the subscales of the AAQoL and the total score. A significant difference appeared between males and females on the total AAQoL score and all the subscales, except life outlook, with females having lower

scores on that scale. One-way analyses of variance (ANOVA) showed no significant differences

in AAQoL scores between age groups as shown in Table 6, except for the life productivity

subscale, $F(6, 587) = 2.49$, $p =0.022$.

Table 5.

The mean scores by gender on each AAQoL subscale and, t-values

	Male				Female			
	n	M	SD		n	M	SD	t-value
Life productivity	304	42.0	20.4		290	32.5	17.4	6.17**
Psychological health	304	53.3	21.7		290	42.0	22.6	6.22**
Relationship	304	56.0	20.5		290	49.4	23.9	3.67**
Life outlook	304	48.0	18.1		290	47.0	17.4	0.60
Total	305	48.3	16.8		293	41.0	15.9	5.58**

Note. M=Mean. SD=Standard deviation. **$p<.001$

Table 6 describes if there is a significant difference between age groups on the AAQoL.

The mean scores for the age group 60 and older was the highest (M=56.25) for the total score of

the AAQoL and the mean score for the age group 32-38 for the total score was the lowest

(M=42.40). Post-hoc analyses showed no significant difference, and it is possible that the global

effect was too weak (0.022).

Table 6.

ANOVA comparison between age at the time of diagnosis and AAQoL.

	Df	F	p-value
Life productivity	6	2.49	0.022
Phycological health	6	1.03	0.407
Relationship	6	1.22	0.296
Life outlook	6	0.77	0.594
Total	6	1.46	0.189

In Table 7, the effect from score on current symptoms of ADHD rating scale on each subscale of AAQoL is shown. The total score on AAQoL is significantly associated with all subscales of ADHD rating scale. These results suggest that there is an association between scores on ADHD rating scale and AAQoL scale.

Table 7.

Pearson's correlataion between score on ADHD rating scale and total scores on AAQoL and subscales

Measure	n	M	SD	1	2	3	4	5	6	7	8
1. AAQoL (lp)	594	37.41	19.62	——							
2. AAQoL (ph)	594	47.80	22.84	.603**	——						
3. AAQoL (R)	594	52.81	22.46	.549**	.664**	——					
4. AAQoL (lo)	594	47.54	17.71	.464**	.590**	.464**	——				
5. AAQoL (total)	598	44.71	16.75	.864**	.859**	.781**	.736**	——			
6. ADHD s-r IA	970	78.68	9.45	-.210**	-.075	-.127**	-.138**	-.182**	——		
7. ADHD s-r HI	971	65.66	13.00	-.099*	-.160**	-.188**	.001	-.144**	.372**	——	
8. ADHD informant IA	961	74.75	13.91	-.104*	-.022	-.045	-.135**	-.092*	.263**	.004	——
9. ADHD informant HI	960	61.68	14.45	-.101*	-.137**	-.195**	-.115**	-.158**	.082*	.431**	.345**

Note: IA = inattention symptoms; HI = hyperactivity/impulsivity symptoms. $**p < 0.01$, $*p. < 0.05$

Discussion

The purpose of this study was to gain a better understanding of gender differences in comorbid disorders in adults with ADHD. Another purpose was to investigate possible association between age or gender at the time of diagnosis and self-reported quality of life and finally, to examine possible correlation between severity of ADHD symptoms, measured with the ADHD rating scale, and self-reported quality of life, measured with AAQoL.

Findings supported, in part, the first hypothesis. There is a gender difference in both comorbid psychiatric disorders and previous psychological difficulties. As predicted, women were more likely to be diagnosed with comorbid anxiety disorders at the time of their ADHD diagnosis than their male counterparts and were more likely to have suffered from depression and/or anxiety before being assessed for ADHD, which is in line with previous findings (Carlson & Gaube, 1997;; Gherson & Gherson, 2002; Rucklidge & Kaplan., 1997, Young et al., 2020). For depressive disorders, no gender difference was found, which is not in line with previous findings where women with ADHD have appeared to be more likely than men to suffer from depression (Rucklidge &Kaplan., 1997; Young et al., 2020). For other psychiatric problems, or social problems, that were not defined any further, the gender difference was not significant, but females tended to have higher prevalence of other problems prior to referral for ADHD assessment.

The second hypothesis was supported. Females with ADHD report a higher internalizing symptoms like stress according to DASS than males with ADHD do. It is though interesting to see that females report more externalizing symptoms according to ADHD rating scale. Gender difference in stress has not been studied before among adults with ADHD to our knowledge, so it is important to study this further. Other scores on the DASS are moderate (anxiety) to severe

(depression). The mean score on the anxiety and stress sub-scales on the DASS are higher for women than for men, but it is similar between the genders on the depression subscale. That supports further the hypothesis that women are more likely to experience anxiety and stress as a comorbid disorder.

The findings also support, in part, the third hypothesis that self-report quality of life is related to gender and age at the time of diagnosis. Females with ADHD report lower quality of life at the time of their diagnosis than their male counterparts do. That is in part consistent with previous research about females with ADHD reporting poorer quality of life than males with ADHD do (Gudjonsson et al., 2009).

Self-reported quality of life does not seem to be related to age at the time of diagnoses in the present study.

The fourth hypothesis is supported. A higher score on the ADHD rating scale is associated with lower self-reported quality of life on the AAQoL. Lower score on AAQoL total score is correlated with all subscales of the ADHD rating scale which assess current symptoms. It has been shown in previous studies that ADHD is related to poorer self-reported quality of life (Gudjonsson et al., 2009).

A strength of this study is a large sample size which can increase the reliability of the results. Assessment for ADHD was carried out by the ADHD team at Landspítali, which works according to clinical guidelines published by the Directorate of Health in Iceland, so the assessments have all been performed in the same way.

One of the limitations of this study is that the information is not identical for all the participants, just over half of the participants that answered AAQoL and DASS were missing in part. It is important to keep that in mind when interpretation the results.

Another limitation of this study is that information on previous problems is sometimes unclear. In some cases, reports on previous problems or symptoms are based on what the patient has reported to their doctor, but in other cases the patient has previously been diagnosed by a psychologist or psychiatrist. Therefore, the results of this study for previous problems must be interpreted carefully. Some of the participants had been diagnosed with ADHD in childhood and had at some point been medicated for ADHD. That could affect the results, it could influence the prevalence of other disorders.

One third of the women in this study were diagnosed with anxiety disorder and one fourth with depression at the time of ADHD diagnoses. These are high rates, making clear the importance of taking the presence of anxiety and depression in young girl seriously and keep in mind that depression and anxiety are common comorbid disorders for ADHD. The rate for previous psychiatric symptoms or diagnosed anxiety and/or depressive disorders is even higher. Over half of women have experienced depression and anxiety. It is easy to assume that experiencing feelings of mental issues is bound to influence self-reported quality of life, which is one of the reasons for the importance of continuing to do research in this field. It is very important to identify gender differences in the manifestation of ADHD and comorbid disorders, and it is also important to be able to detect and treat ADHD and comorbid disorders. This can potentially increase the quality of life of those suffering from ADHD, both for men and women. It is also important to continue studies for adults with ADHD and those who were diagnosed with ADHD in childhood and have received treatment versus those who did not get diagnosis or treatment to compare comorbid disorders and quality of life.

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