

## Attention Deficit Hyperactivity Disorder and its Effects in the Canadian Workplace

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### Abstract

There has been an increase in the prevalence of Attention Deficit Hyperactivity Disorder (ADHD) worldwide with greater attention placed on its resulting impairments in multiple spheres of an individual's performance, including in the workplace. The present investigation was completed to highlight the impact of ADHD in adulthood, with a specific focus on the economic costs and burden of ADHD in the workplace. Patients diagnosed with ADHD (N =100) were evaluated via an online survey assessing demographics, employment history, symptomatology, and quality of life impairments in comparison with a sample of (N = 500) controls. Results indicated that ADHD globally impaired functioning with the most extreme effects observed in education and employment. The majority of respondents with ADHD reported their highest level of education to be a high school diploma and reportedly felt that their ADHD diagnosis and resulting symptomatology prevented them from pursuing their ideal career. Results also indicated improvement in work productivity with the implementation of a workplace medical benefits plan. These findings remind us that it is essential to fully appreciate the negative consequences of impairments associated with a diagnosis of ADHD in order to prompt employers to develop and implement more appropriate workplace interventions to both increase work productivity and optimize patients' outcomes.

**Keywords:** Adult ADHD; Workplace Cost; Productivity; Absenteeism; Work Performance; Life Trajectory

### Abbreviations

ADHD: Attention Deficit Hyperactivity Disorder; ADD: Attention Deficit Disorder

### Introduction

Attention Deficit Hyperactivity Disorder (ADHD) has been reported to have a lifetime prevalence rate of 8.1% [1], with new reports suggesting an adult prevalence of 5.8% [2]. ADHD is typically characterized by a persistent pattern of inattention, hyperactivity, forgetfulness, distractibility and impulsive behaviors [3]. Specifically, it may be characterized by pervasive non-goal directed over-activity, a lack of ability to focus or maintain attention, and an increased vulnerability to impulsivity. These symptoms are associated with altered reward and executive functioning systems in the brain [55]. The classical onset of this neurodevelopmental disorder is generally noted during childhood [4,5] and is known to affect approximately 2% to 18% of school-age children worldwide [6,7].

Although originally considered a pediatric and adolescent condition [8], it is now widely recognized that the majority of ADHD cases will persist into adulthood [9-18]. Specifically, up to 65% of affected children continue to be symptomatic into adulthood [8,9,13,19]. Although ADHD is more often diagnosed in males over females, especially in childhood, these gender differences tend to even out in adulthood [20]. This difference in early detection is likely due to the predominantly overt behavioural symptoms, such as poor impulse control and hyperactivity, which are generally considered to be more problematic compared to symptoms of inattention and are more characteristically observed in males than females [21].

Notwithstanding the prevalence rate, ADHD is frequently undiagnosed and therefore untreated, often resulting in a profound negative impact on the individual's quality of life [22]. Underdiagnosis often leads to impairments in several areas of life, including impaired psychosocial functioning with increased disruptive behaviors [23-26], social and interpersonal skills deficits [23-25,27,28], and emotional instability [23-25]. Marked academic deficits may occur at any age and include both poor achievement and poor vocational performance [23-26,29]. By adulthood, these impairments are equally evident in males and females [30].

Adults with ADHD are also more likely to be diagnosed with comorbid psychiatric conditions including mood and anxiety disorders, substance use disorders and externalizing personality disorders [24,31]. There is evidence that the presence of comorbid ADHD and a depressive disorder increases the risk of treatment resistance and suicidal ideation, while also being associated with a history of suicide attempts [32,33]. The majority of individuals with ADHD have a co-occurring psychiatric condition [4,14,34] and each additional comorbid condition will contribute to further disability and impairments for the individual [24].

Individuals with ADHD demonstrate greater levels of functional impairments in the workplace compared to those without a diagnosis of ADHD [4]. Reports on identified impairments include in this population: (i) attention-related difficulties involving 'divided attention' and 'attention shifting'; (ii) challenges in terms of adhering to job structure and design; (iii) challenges associated with self-management and impulsivity; and (iv) management of adverse tasks or colleagues [35]. Barkley and colleagues [36] observed significant differences in the percentage of employees with ADHD dismissed from employment (43.2%) compared to non-ADHD employees (14.0%). The large difference in these statistics suggests that the ADHD population suffers greater functional impairments, which adversely affected their ability to work effectively and to continue to maintain their employment as compared to their non-ADHD counterparts.

Similarly, Zhao, *et al.* [37] studied working memory performance and IQ in adults with and without ADHD and found that adults with ADHD and a normal IQ suffer from greater impairments in their working memory capability than healthy controls with similar IQs. More specifically, individuals with ADHD were found to face challenges in their capacity for *verbal* working memory as measured by low reaction time and visible attention deviation [38,39]. These marked impairments contribute to reduced levels of executive functioning resulting in greater challenges in quotidian workplace-related tasks including time management, organization, prioritization, and decision-making.

As a rule, people with ADHD also exhibit greater rates of absenteeism and display impaired social role functioning [4,13,25,26,35,36,40-44]. In addition, adults with ADHD are less successful and less prone to achieve educational milestones when compared to those without ADHD, further limiting their long-term employment and future occupational opportunities and prospects [21,22]. This is congruent with reports by Biederman, *et al.* [22] who found that individuals with ADHD had significantly lower levels of educational performance and attainment, with 32% failing to complete their high school education.

One of the consequences of ADHD in adulthood includes significantly lower household incomes for those with ADHD compared to those without the disorder [45]. Multiple studies have compared adults with ADHD to those without ADHD and showed that adults with ADHD lost between \$209 to \$12,189 in annual household income chiefly as a result of absenteeism, poor work productivity, and greater need and use of disability pay and/or worker's compensation [22,46]. Furthermore, a survey was conducted by the World Health Organization studying lost work productivity as a consequence of adult ADHD in ten countries spanning the Middle East, Europe, South America and North America, indicated that over 143 million days of work production were lost by adults with ADHD [47]. Moreover, employees

with ADHD were found to have an average increase of 8.4 sick days per year, with 21.7 and 13.6 work days associated with reduced work quantity and reduced work quality, respectively [47]. This contrasts greatly with the fact that in the 21<sup>st</sup> century, we have better diagnostic tools and treatments, and yet only a small number of workers with ADHD actually receive treatments; treatments that could relieve their symptoms and potentially improve overall functioning [47].

The present study was undertaken to assess the experience of individuals with ADHD in the Canadian workforce to specifically demonstrate the impact of their diagnosis and illness on their vocational productivity. The survey also focused on barriers that prevent these individuals from achieving their ideal goals. Given the large body of data already addressing these issues, it was hypothesized that employees with ADHD would have greater impairments in the workplace, increased day-to-day functional difficulties, and unique challenges and impediments compared to work colleagues without ADHD. We also examined the nature of employer recognition with the future goal of developing suitable strategies and accommodations for employees with ADHD.

### Methods

#### ADHD survey

The present study utilized data from an online survey sent to a nationally representative sample of 5000 Canadians, obtained via an Omnibus study database. The data was collected from April 1, 2013 to May 31, 2013, with a target of 100 adults with ADHD to be surveyed for exploratory data collection. Adults were selected based upon an answer of *yes* to “Have you ever been diagnosed with ADD/ADHD by a health care professional?” Respondents who self-identified as being diagnosed with ADHD by a health care professional were later sent an invitation to participate in an online survey in which they confirmed that their ADHD diagnosis had been made by a trained healthcare professional. The first 100 responders that completed the survey and responded *yes* to having been diagnosed with ADHD were included in the total sample, thus, there were no dropouts. The survey took approximately 8 minutes to complete and was to be completed by the respondent between April-May of 2013. The survey included a total of 39 questions with some being multipart questions. Survey questions related to one’s circumstances of employment, educational status and ADHD history, with a focus on current impairments and availability of employer accommodations.

#### Control group survey

A subsequent survey was sent to a gender-matched nationally representative sample to provide a control group without an ADHD diagnosis for comparison. In the control group survey, participants were first asked to indicate whether or not they had ever been diagnosed with ADD/ADHD by a healthcare professional and positive responders were excluded from any further study. Negative responders who had no ADHD history were prompted to continue the survey and were asked a series of 19 questions pertaining to employment and educational status, the presence of other existing mental health conditions and workplace stress, while focusing again on occupational impairment and availability of employment accommodations. This survey was approximately 5 minutes in duration and was to be completed by the respondents from January 1 to January 31, 2017.

The inclusion of a control group survey presented valuable supplementary data and a platform for which differences in work impairment and resulting accommodations in ADHD versus matched non-ADHD cohorts could be compared. See appendices for the online surveys in their entirety (Appendix 1 and 2).

Data analysis was conducted on the primary outcome measure (mean number of jobs held by the ADHD group compared to the control group) as well as the secondary outcome measures using a two-tailed Student’s *t*-test for independent samples using IBM SPSS Statistics Version 24.0.

### Results

Analyses were conducted to compare differences in demographic characteristics of the 100 ADHD respondents compared to the 500 non-ADHD respondents. Characteristics included but were not limited to an assessment of education level, employment status, and annual household income. In general, large discrepancies in the total percentages for each category were observed. Table 1 demonstrates a complete description of the demographic information collected from both samples.

	% Total ADHD Respondents (n = 100)	% Total non-ADHD Respondents (n = 500)
<b>Gender</b>		
Male	49	46
Female	51	52
<b>Age</b>		
Under 30	30	22
30 - 29	29	25
40 - 49	17	23
50 - 59	19	21
60+	6	8
<b>Education Level</b>		
Post-Secondary	34	85
High School Diploma	62	13
Other	4	1
<b>Employment Status</b>		
Employed full-time	55	98
Employed part-time	40	2
Self-employed	13	-
Not currently employed/in-between jobs	16	-
Retired	10	-
Student	8	-
Homemaker	8	-
Other	4	-
<b>Annual Household Income</b>		
Less than \$30,000	34	7
\$30,000 to \$59,000	28	29
\$60,000 to \$99,000	11	34
\$100,000 to \$124,999	6	12
\$125,000 or more	7	12
Prefer not to answer	15	4
<b>Work Environment</b>	<b>n = 53*</b>	<b>n = 500</b>
Office, functional/practical	29	50
Retail	13	7
Educational Institution	11	6
Warehouse/Manufacturing Plant	11	10
Out-Doors/Worksite	10	7
Healthcare Institution	8	7
Office, Creative/Artistic	7	3
Hospitality/Service	2	6
Other	7	4
N/A	2	-

**Table 1:** Demographics of ADHD and control samples.

*\*Note:* only 53 (53%) of the total ADHD sample were employed during the time of the survey.

Twenty-one percent of the ADHD sample reported working primarily in a manual or physical labor position with only 4% working in an executive or management position. These rates were significantly lower compared to those in the control group, where 49% were working in middle management, non-entry level white-collar positions, or in executive management positions. Furthermore, 2 in 3 ADHD respondents had reported that they had changed jobs in the past 5 years, with 38% of the sample switching jobs 2-3 times, 18% switching 4 - 5 times, and 8% switching 6 - 9 times in the past 5 years. The majority of the control sample (57%) had held one position over the previous 5 years and less than 1% had changed jobs 6-9 times (Table 2).

Total # of Jobs in Past 5 Years	% Total Employed ADHD Respondents (n = 53)	% Total Employed non-ADHD Respondents (n = 500)
1	37	57
2 - 3	38	35
4 - 5	18	6
6 to 9	8	< 1
N/A	-	1

**Table 2:** How many jobs have you held in the past 5 years? ADHD group versus control group.

**Note:** at time of survey, 47 (47%) of ADHD respondents were unemployed, compared to 0 (0%) of non-ADHD control group respondents, hence the discrepancy in sample size from the original sample.

Items D11 of the ADHD survey and D12 of the control group survey assessed the number of positions held (the question was: “How many jobs have you held in the past 5 years?”) were analyzed using descriptive statistics (Table 2). At the time of the survey, only 53% of ADHD respondents were employed, compared to 100% of non-ADHD respondents. Given that in both questionnaires subject responses were divided into preexisting subcategories, the midpoints of every response category were used to approximate a normal distribution of scores for each subject in each group.

Preliminary data analysis was conducted and the groups were compared using a two-tailed Student’s *t* - test for independent samples with a significance level set at  $\alpha < 0.05$ . Outliers and unemployed respondents were excluded from the analysis. The assumption of homogeneity of variances was assessed using Levene’s test,  $F = 9.01, p = .003$ ; violating the assumption of equal variances, therefore, equal variances not assumed is reported. There was a statistically significant difference between the mean number of jobs held by the ADHD group ( $M = 2.6, SD = 1.8$ ) compared with the control group ( $M = 1.8, SD = 1.1$ ),  $t(56.5) = 3.08, p = .003$ , with a medium effect size [48,49] as measured by Cohen’s *d* ( $d = .516$ ). Hedge’s *g* was assessed to account for the difference in sample size and yielded a larger effect ( $g = .641$ ). The 95% CI for interval difference between the sample means,  $M_1 - M_2$ , had a lower bound of .268 and an upper bound of 1.27. These results suggest that employed individuals with ADHD change their positions significantly more frequently than healthy controls over a 5-year time period.

Within the ADHD group, the average length of time before a diagnosis of ADHD was made, was found to be 2.9 years, with 71% of the sample reporting that they suspected having ADHD prior to receiving a diagnosis. The most commonly reported symptoms of ADHD that necessitated seeking professional help included: decreased ability to focus and concentrate, increased rates of hyperactivity, and behavioral and/or emotional volatility. The complete list of symptoms is outlined in table 3.

Total ADHD respondents (N = 100)	%
Focus/concentration	50
Hyperactivity	27
Behaviour/Emotional	21
Memory	10
Sleep issues	7
Impulsivity	2

**Table 3:** Percentage of most commonly reported symptoms for seeking professional help in the ADHD sample.

The study validated that the presence of comorbid disorders was highly prevalent in this ADHD population. Figure 1 demonstrates the prevalence rates of comorbid diagnoses in the ADHD sample compared to the prevalence rates of mental health disorders in the non-ADHD control group sample. Interestingly, 95% of the currently unemployed ADHD respondents had suffered from at least 1 comorbid psychiatric condition, compared to 75% of those currently employed (Figure 1).

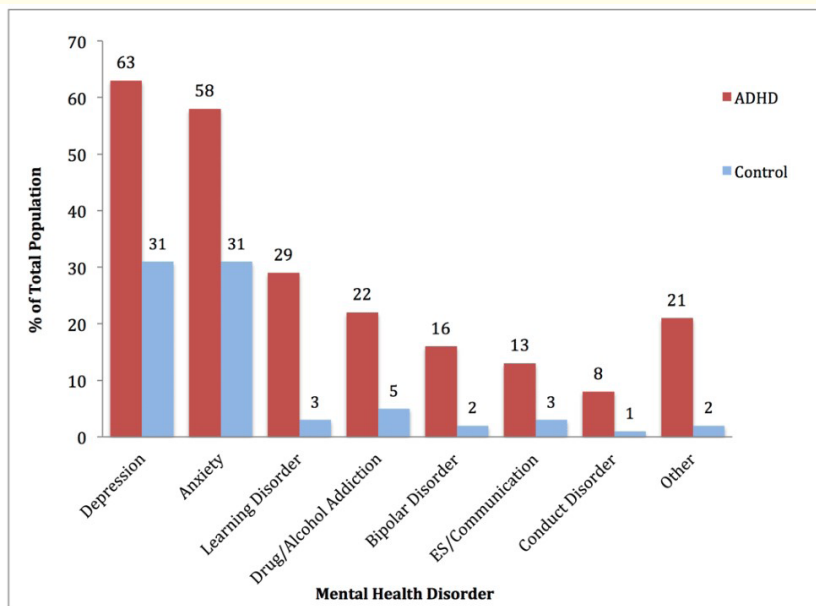


Figure 1: Prevalence Rates of Comorbid Psychiatric Diagnoses in the ADHD Versus Control Samples.

The impact of ADHD on one’s functioning was clear in this sample, as 51% of respondents had missed time at work and/or school in the previous 12 months due to their ADHD, with 4 in 5 respondents making up less than half of the time that they missed. Ninety-five percent of the ADHD respondents reported that they were not able to function at their full capacity, noting mental exhaustion (78%), procrastination (76%), and difficulties wrapping up the final details of a project (66%) as their greatest challenges, compared to 92% of the control sample that reported being able to multitask successfully and 66% reporting that they take steps to manage workplace stress. Negative outcomes associated with ADHD were further demonstrated as 38% of respondents reported quitting a job, while 27% reported losing a job due to their symptoms over their lifetime.

Stigma in relation to the disorder was noted to impact various domains of the responder’s lives, such that greater than half of the respondents (51%) reported that others in their places of employment were aware of their ADHD. Responders noted that stigma limited their ability to ask for accommodation in relation to their concerns that their ADHD diagnosis would be: misunderstood (49%); seen as strictly diagnosed in children (46%); or seen as an excuse (42%). In fact, less than half of respondents (48%) reported that they felt their employer and/or school accommodated their needs. Although 65% of respondents wished more services and resources were available for them, only 43% reported that they were even allowed to take unscheduled breaks when they needed them.

Use of pharmacotherapeutic treatment was assessed in this survey, in which only 36% of ADHD respondents reported taking medication. Instead, responders reported using of a variety of coping mechanisms including exercise (31%), nutrition (20%), therapy (17%), and meditation (16%) to cope; however, 1 in 5 ADHD respondents could not identify any coping mechanism for their ADHD. As well, surfing the internet (46%), walking (33%), coffee breaks (31%), talking or texting (26%), or spending time away from others (26%) were identified as coping mechanisms specifically used in one’s place of employment and/or school in the ADHD sample.

In the ADHD sample, while just over half of the respondents (53%) reported having a drug benefit plan, only 32% reported that all of their medication costs were covered and approximately 17% reported that their medications were partially subsidized/covered. The net effect of having the costs of medications supported through respondent's benefits plan offers individuals a sense of job security [50,51]. This was demonstrated in that 43% of respondents who were not receiving medications reported fear of job loss versus 31% of those with benefits for their medications. Furthermore, respondents who were on medication reported taking off less time from their workplace or school because of their ADHD (46%), compared to those not taking any medication (57%).

### Discussion

ADHD is a chronic and potentially disabling disorder impacting multiple domains of one's life, yet is often under-diagnosed and untreated. The benefits of early and accurate detection of the disorder is often compromised due to the tendency for healthcare professionals to focus on comorbid conditions, such as depressive and anxiety disorders, as was demonstrated in the present sample. This leads to misdiagnosis, under-treatment and has long-term effects on one's psychological and occupational/academic wellbeing. Delays in diagnosis and under-recognition can be a result of overlapping symptomatology of the comorbid disorders. The primary focus of treatment another disorder means that the cognitive and behavioral ADHD symptoms will only be addressed much later if treated at all. As was clearly evident in this sample, the debilitating nature of an ADHD diagnosis and specifically, its impact in both academic and workplace settings, must be further recognized and better understood.

The lower level of academic achievement in the ADHD sample reportedly acted as a barrier to these individuals pursuing their ideal careers, which is also reflected in the ADHD literature [41,52,53]. Moreover, respondents were primarily employed in areas of manual and physical labor suggesting that core features of the disorder, such as lack of focus, procrastination, and mental exhaustion often prevent individuals from advancing their career in office settings or executive roles. Negative outcomes associated with symptoms of ADHD were further demonstrated by the percentage of respondents who reported quitting or losing a job due to their symptoms over their lifetime.

Although missing school and/or work on account of ADHD symptoms was reported in more than half of the ADHD sample, accommodations for these individuals in academic and work settings remained sparse. Fear of being judged or misunderstood by employers is prominent in the ADHD population and may partially explain their lack of attempts to request and obtain accommodations. As a result, these individuals often develop maladaptive coping mechanisms in the workplace in the attempt to reduce the burden placed on them, explaining why almost all respondents admit that they are unable to function at their full capacity.

Employees with ADHD experience difficulties with time management, organization, procrastination, taking direction, as well as in managing their emotional liability [4,35]. They tend to have poorer social skills, which can be understood to affect relationships with colleagues; it can be hypothesized that these individuals could be seen as impulsive, abrasive and volatile [4]. Furthermore, some individuals with ADHD can be hyper-focused in activities especially when incentives are involved, potentially leading to overworking and undue stress [4].

Medications as first-line treatment are often required as part of a multimodal treatment approach for ADHD in order to reduce functional impairment and demoralization. Unfortunately, many workplaces do not offer adequate drug benefit plans that provide any medical coverage. Despite half of all respondents in the ADHD sample reporting having access to some benefit plan at their current place of employment, less than two thirds received full coverage for their medications and a small but significant number did not receive even partial coverage. This is concerning due to the significant differences in clinical effectiveness of brand name medication compared to their generic version [56]. With the cost of obtaining such treatment often being quite high causing significant financial burden, this first-line treatment option may be less available, leading to impairment and worsening of overall outcomes. As medicated respondents demonstrated less disability in the workplace than those who were unmedicated, it is essential for employers to consider these factors in the workplace.



Implementing full medical benefits plans and establishing psychological support resources within the workplace for employees with ADHD may lead to better outcomes, including improved productivity and employee satisfaction. Furthermore, employers could implement minor policies to improve employee productivity with the principal symptoms of ADHD in mind. For instance, given that people suffering with ADHD often have difficulties with time management, more frequent and supportive check-ins from supervisors, managers, or email reminders may be instituted to help these individuals remain on schedule. Changes in the office configuration may also be of use to these individuals; avoiding open concept designs and instead implementing private and quiet workstations might decrease the distractibility that is commonly described in individuals suffering with ADHD. In addition, allowing employees to work from home and virtually through a variety of telecommunications tools, as well as allowing for more frequent short-period breaks for ADHD employees, are all potential strategies that may lead these individuals to succeed, and in turn increase overall work productivity [4,57].

Limitations must be considered when interpreting the findings of the present study. ADHD and other mental disorder diagnoses were not confirmed through psychiatric assessments or through the evaluation of patient history, but rather, through respondent self-reports. Severity of ADHD was also not assessed and therefore any potential relationship between ADHD severity and functioning in the workplace was unfortunately unavailable to the authors. Future studies ought to investigate the severity and subtype of symptoms and should also consider controlling for healthcare professional given the differences in diagnosis between general practitioners and psychiatrists [58,59]. Finally, the present study may have also been influenced by potential differences in the Ontario job market during the time each of the surveys was circulated. Accordingly, future comparison studies should include a matched control group distributed during the same time period in order for the data to be consequential.

## Conclusion

ADHD is often overlooked and misunderstood in terms of disability, however the impairing symptomatology of the disorder results in significantly decreased functioning in multiple domains. The present study demonstrated the chronic impairments experienced as a result of ADHD in the workplace and the need for employer recognition and accommodation. In order to decrease costs associated with lost work productivity and increase work satisfaction in employees with ADHD, strategies aimed at reducing stigma, improving work productivity by adjusting the work environment and unreasonably high workload are required. It is imperative that employers be aware of these potential issues in the workplace in order to avoid employee burnout. Further research is necessary in order to fully elucidate all factors that impact individuals with ADHD and their functioning in the workplace.

## Conflict of Interest

All other authors have no conflicts of interest.

## Bibliography

1. Kessler Ronald C., *et al.* "Patterns and Predictors of Attention-Deficit/Hyperactivity Disorder Persistence into Adulthood: Results from the National Comorbidity Survey Replication". *Biological Psychiatry* 57.11 (2005): 1442-1451.
2. Vitola ES., *et al.* "Exploring DSM-5 ADHD Criteria beyond Young Adulthood: Phenomenology, Psychometric Properties and Prevalence in a Large Three-Decade Birth Cohort". *Psychological Medicine* 47.4 (2017): 744-754.
3. Diagnostic and Statistical Manual of Mental Disorders (DSM-5®) - American Psychiatric Association - Google Books.
4. Tripp Gail and Jeffery R Wickens. "Neurobiology of ADHD". *Neuropharmacology* 57.7-8 (2009): 579-589.
5. Adamou Marios., *et al.* "Occupational Issues of Adults with ADHD". *BMC Psychiatry* 13.1 (2013): 59.
6. Fredriksen Mats., *et al.* "Childhood and Persistent ADHD Symptoms Associated with Educational Failure and Long-Term Occupational Disability in Adult ADHD". *Attention Deficit and Hyperactivity Disorders* 6.2 (2014): 87-99.



7. Faraone Stephen V., et al. "The Worldwide Prevalence of ADHD: Is It an American Condition?" *World Psychiatry: Official Journal of the World Psychiatric Association (WPA)* 2.2 (2003): 104-113.
8. Rowland Andrew S., et al. "The Prevalence of ADHD in a Population-Based Sample". *Journal of Attention Disorders* 19.9 (2015): 741-754.
9. Faraone Stephen V., et al. "The Age-Dependent Decline of Attention Deficit Hyperactivity Disorder: A Meta-Analysis of Follow-up Studies". *Psychological Medicine* 36.2 (2006): 159-165.
10. Barkley Russell A., et al. "The Persistence of Attention-Deficit/Hyperactivity Disorder into Young Adulthood as a Function of Reporting Source and Definition of Disorder". *Journal of Abnormal Psychology* 111.2 (2002): 279-289.
11. Biederman Joseph., et al. "Predictors of Persistent ADHD: An 11-Year Follow-up Study". *Journal of Psychiatric Research* 45.2 (2011): 150-155.
12. Biederman J., et al. "Predictors of Persistence in Girls with Attention Deficit Hyperactivity Disorder: Results from an 11-Year Controlled Follow-up Study". *Acta Psychiatrica Scandinavica* 125.2 (2012): 147-156.
13. Kessler Ronald C., et al. "Lifetime Prevalence and Age-of-Onset Distributions of DSM-IV Disorders in the National Comorbidity Survey Replication". *Archives of General Psychiatry* 62.6 (2005): 593-602.
14. Kessler Ronald C., et al. "The Prevalence and Correlates of Adult ADHD in the United States: Results from the National Comorbidity Survey Replication". *The American Journal of Psychiatry* 163.4 (2006): 716-723.
15. Klassen Larry J., et al. "Comorbid Attention Deficit/Hyperactivity Disorder and Substance Use Disorder: Treatment Considerations". *Current Drug Abuse Reviews* 5.3 (2012): 190-198.
16. Lara Carmen., et al. "Childhood Predictors of Adult ADHD: Results from the WHO World Mental Health (WMH) Survey Initiative". *Biological Psychiatry* 65.1 (2009): 46-54.
17. Mannuzza Salvatore., et al. "Persistence of Attention-Deficit/Hyperactivity Disorder into Adulthood: What Have We Learned from the Prospective Follow-up Studies?" *Journal of Attention Disorders* 7.2 (2003): 93-100.
18. Faraone Stephen V., et al. "Diagnosing Adult Attention Deficit Hyperactivity Disorder: Are Late Onset and Subthreshold Diagnoses Valid?" *American Journal of Psychiatry* 163.10 (2006): 1720-1729.
19. Quinn Patricia O and Manisha Madhoo. "A Review of Attention-Deficit/Hyperactivity Disorder in Women and Girls: Uncovering This Hidden Diagnosis". *The Primary Care Companion for CNS Disorders* 16.3 (2014).
20. Biederman Joseph., et al. "Young Adult Outcome of Attention Deficit Hyperactivity Disorder: A Controlled 10-Year Follow-up Study". *Psychological Medicine* 36.2 (2006): 167-179.
21. Davids E., et al. "Analysis of a special consultation for attention deficit/hyperactivity disorder in adults". *Gesundheitswesen (Bundesverband der Ärzte des Öffentlichen Gesundheitsdienstes (Germany))* 66.7 (2004): 416-422.
22. Ginsberg Ylva., et al. "Underdiagnosis of Attention-Deficit/Hyperactivity Disorder in Adult Patients: A Review of the Literature". *The Primary Care Companion for CNS Disorders* 16.3 (2014).
23. Halmøy Anne., et al. "Occupational Outcome in Adult ADHD: Impact of Symptom Profile, Comorbid Psychiatric Problems, and Treatment: A Cross-Sectional Study of 414 Clinically Diagnosed Adult ADHD Patients". *Journal of Attention Disorders* 13.2 (2009): 175-187.
24. Murphy K and RA Barkley. "Attention Deficit Hyperactivity Disorder Adults: Comorbidities and Adaptive Impairments". *Comprehensive Psychiatry* 37.6 (1996): 393-401.

25. Eakin L., et al. "The Marital and Family Functioning of Adults with ADHD and Their Spouses". *Journal of Attention Disorders* 8.1 (2004): 1-10.
26. Friedman Naomi P and Akira Miyake. "The Relations Among Inhibition and Interference Control Functions: A Latent-Variable Analysis". *Journal of Experimental Psychology: General* 133.1 (2004): 101-135.
27. Weyandt Lisa L., et al. "Neuropsychological Functioning in College Students with and without ADHD". *Neuropsychology* 31.2 (2017): 160-172.
28. Rucklidge Julia J. "Gender Differences in ADHD: Implications for Psychosocial Treatments". *Expert Review of Neurotherapeutics* 8.4 (2008): 643-655.
29. Jensen, Peter S., et al. "Comorbidity in ADHD: Implications for Research, Practice, and DSM-V". *Journal of the American Academy of Child and Adolescent Psychiatry* 36.8 (1997): 1065-1079.
30. Chronis-Tuscano Andrea., et al. "Very Early Predictors of Adolescent Depression and Suicide Attempts in Children With Attention-Deficit/Hyperactivity Disorder". *Archives of General Psychiatry* 67.10 (2010): 1044-1051.
31. Sternat Tia., et al. "Trait anhedonia: A risk factor for undetected attention deficit hyperactivity disorder and suicide in adult depressed patients". *ADHD Attention Deficit Hyperactivity Disorder* 9.1 (2017): 1-55.
32. Biederman J., et al. "Psychoactive Substance Use Disorders in Adults with Attention Deficit Hyperactivity Disorder (ADHD): Effects of ADHD and Psychiatric Comorbidity". *The American Journal of Psychiatry* 152.11 (1995): 1652-1658.
33. Mather B. "Early career experiences of young adults with attention deficit hyperactivity disorder". (Doctoral dissertation). Fielding Graduate University, Santa Barbara (2014).
34. Barkley Russell A., et al. "Young Adult Outcome of Hyperactive Children: Adaptive Functioning in Major Life Activities". *Journal of the American Academy of Child and Adolescent Psychiatry* 45.2 (2006): 192-202.
35. Zhao X., et al. "Working memory performance in high intelligence quotient adults with attention-deficit/hyperactivity disorder". *Chinese Mental Health Journal* 28 (2014b): 417-422.
36. Brown Thomas E., et al. "Executive Function Impairments in High IQ Adults With ADHD". *Journal of Attention Disorders* 13.2 (2009): 161-167.
37. Zhao X., et al. "Abnormal working memory in adults with attention-deficit/hyperactivity disorder". *Chinese Mental Health Journal* 28 (2014a): 57-62.
38. Katzman Martin A and Tia Sternat. "A Review of OROS Methylphenidate (Concerta®) in the Treatment of Attention-Deficit/Hyperactivity Disorder". *CNS Drugs* 28.11 (2014): 1005-1033.
39. Klein Rachel G., et al. "Clinical and Functional Outcome of Childhood ADHD 33 Years Later". *Archives of General Psychiatry* 69.12 (2012): 1295-1303.
40. Mannuzza Salvatore and Rachel G Klein. "Long-Term Prognosis in Attention-Deficit/Hyperactivity Disorder". *Child and Adolescent Psychiatric Clinics* 9.3 (2000): 711-726.
41. Secnik Kristina., et al. "Comorbidities and Costs of Adult Patients Diagnosed with Attention-Deficit Hyperactivity Disorder". *Pharmacoeconomics* 23.1 (2005): 93-102.
42. Voigt Robert G., et al. "Academic Achievement in Adults with a History of Childhood Attention-Deficit/Hyperactivity Disorder: A Population-Based Prospective Study". *Journal of Developmental and Behavioral Pediatrics: JDBP* 38.1 (2017): 1-11.

43. Kuo Frances E and Andrea Faber Taylor. "A Potential Natural Treatment for Attention-Deficit/Hyperactivity Disorder: Evidence From a National Study". *American Journal of Public Health* 94.9 (2004): 1580-1586.
44. Doshi Jalpa A., et al. "Economic Impact of Childhood and Adult Attention-Deficit/Hyperactivity Disorder in the United States". *Journal of the American Academy of Child and Adolescent Psychiatry* 51.10 (2012): 990-1002.e2.
45. Graaf R de., et al. "The Prevalence and Effects of Adult Attention-Deficit/Hyperactivity Disorder (ADHD) on the Performance of Workers: Results from the WHO World Mental Health Survey Initiative". *Occupational and Environmental Medicine* 65.12 (2008): 835-842.
46. Carson C. "The Effective Use of Effect Size Indices in Institutional Research". Citováno Dne (2012).
47. Sullivan Gail M and Richard Feinn. "Using Effect Size-or Why the P Value Is Not Enough". *Journal of Graduate Medical Education* 4.3 (2012): 279-282.
48. Artz Benjamin. "Fringe Benefits and Job Satisfaction". *International Journal of Manpower* 31.6 (2010): 626-644.
49. McHugh Matthew D., et al. "Nurses' Widespread Job Dissatisfaction, Burnout, and Frustration with Health Benefits Signal Problems for Patient Care". *Health Affairs (Project Hope)* 30.2 (2011): 202-210.
50. Harpin VA. "The Effect of ADHD on the Life of an Individual, Their Family, and Community from Preschool to Adult Life". *Archives of Disease in Childhood* 90.1 (2005): i2-i7.
51. Kuriyan Aparajita B., et al. "Young Adult Educational and Vocational Outcomes of Children Diagnosed with ADHD". *Journal of Abnormal Child Psychology* 41.1 (2013): 27-41.
52. Kirino Eiji., et al. "Sociodemographics, Comorbidities, Healthcare Utilization and Work Productivity in Japanese Patients with Adult ADHD". *PLOS ONE* 10.7 (2015): e0132233.
53. Lally Michelle D., et al. "Not All Generic Concerta Is Created Equal: Comparison of OROS Versus Non-OROS for the Treatment of ADHD". *Clinical Pediatrics* 55.13 (2016): 1197-1201.
54. Murphy Kevin. "Psychosocial Treatments for ADHD in Teens and Adults: A Practice-Friendly Review". *Journal of Clinical Psychology* 61.5 (2005): 607-619.
55. Halverson Jerry and Carlyle Chan. "Screening for Psychiatric Disorders in Primary Care". *WMJ: Official Publication of the State Medical Society of Wisconsin* 103.6 (2004): 46-51.
56. Mitchell Alex J., et al. "Clinical Diagnosis of Depression in Primary Care: A Meta-Analysis". *The Lancet* 374.9690 (2009): 609-619.
57. Sjöwall Douglas., et al. "Multiple Deficits in ADHD: Executive Dysfunction, Delay Aversion, Reaction Time Variability, and Emotional Deficits: Neuropsychological and Emotional Deficits in ADHD". *Journal of Child Psychology and Psychiatry* 54.6 (2013): 619-627.

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