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The consequences of an ADHD-score in the clinical range in adolescence for mental health in young adults.

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Preface

The idea and inspiration for this thesis is based on an interest in, and personal interaction with adults who are struggling with the everyday symptoms of ADHD, both diagnosed and undiagnosed. I wanted to investigate how children and adolescents with ADHD-symptoms cope with the transition to adulthood. Particularly concerning mental health, but also considering other aspects of life and functioning.

I would like to thank my supervisor Siv Kvernmo. I would also like to thank my closest family for supporting me and enduring my swinging mood in the last couple of months.

Tromsø, 03.06.19

A handwritten signature in blue ink that reads "Andreas Haldorsen". The signature is written in a cursive style and is positioned above the printed name.

Andreas Haldorsen

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Abstract

Objectives

To investigate the consequences of ADHD symptoms in adolescence to mental health as young adult, in a Norwegian population.

Design and setting

Data were obtained from the Norwegian Arctic Adolescent Health Study, a school-based survey conducted among 10th grade students in North Norway (2003-2005). This data were linked to the Norwegian Patient Registry(2008-2012).

Participants

In total, 3987 (68%) of all 5877 invited participants consented to the registry linkage.

Methods

The questionnaire in this study included many different subject areas, physical health, living conditions, life events, and sociodemographic relations, and it also included the Strength and Difficulties Questionnaire (SDQ). Based on the SDQ the symptom score «very high» was combined with the impact score “very high” to define an ADHD-group within the clinical range (n=94). This group was compared to a control group (n=3893) consisting of all the participants that did not qualify for the ADHD-group with scores in the clinical range.

Results

The findings in this study suggest that the group with scores in the ADHD clinical range are significantly more likely to suffer mental health problems later in life. All the included variables indicate statistically significant differences between the two groups compared.

Conclusion

The group of participants in this study defined in an ADHD-group within the clinical range are found to have statistically significant higher risk in all the examined variables compared to the control group.

1 Introduction

Attention deficit-hyperactivity disorder (ADHD) is diagnosed according to the DSM-IV (Diagnostic and Statistical Manual of Mental Disorders by the American Psychiatric Association)(1) and the ICD-10 (International Classification of Diseases) of the World Health Organization (WHO)(2)

Referral to the specialized health care services, and treatment of ADHD is increasing among adolescents in Norway. The social and health department are estimating that 3-5 percent of children and adolescents under the age of 18 years qualify for the ADHD-diagnosis. Children and adolescents with ADHD often have other difficulties such as learning difficulties, delayed motoric development and psychiatric problems like anxiety, depression and a lowered self-image.(3) In Norway, the last two decades there has been an increase in referral based on hyperactive/concentration difficulties (ADHD related) to psychiatric health care for children and adolescents. In 1992 1,2% of referrals had this problem.(4) In 2009 the referrals had increased to 22,1%.(5) ICD-10 Hyperkinetic disorder (ADHD) amounted to 15,4 % of axis I disorders, in 2009 ADHD was the most common disorder (25,9%).(5)

It is however unclear how many of the children expressing symptoms of ADHD in childhood, continue to express symptoms as adults, and it is evident that the level of functionality varies, but the functionality is generally lower if the symptoms of ADHD persist into adulthood.(6)

Several methodological factors intrinsically related to the ADHD diagnosis, demographic and sample characteristics, and information source (self or other) seem to be responsible for different persistence rates from childhood to adulthood among studies. Since evidence from longitudinal studies on ADHD is scarce and extremely heterogeneous in methodology, it is difficult to disentangle with statistical methods the role of each of these factors in explaining heterogeneity of ADHD persistence rate. This scenario results in a wide range of observed persistence rates among studies, from as low as 4%(7) to as high as 76%(8, 9). More research is necessary to understand and evaluate important factors in the transition from childhood and adolescence to adulthood in patients with the ADHD diagnosis.(10)

The onset of the ADHD occurs in childhood. Some children grow out of their ADHD symptoms during adolescence, but it is estimated that as much as 80% of those diagnosed with ADHD in childhood continue to have symptoms throughout life.(7, 11, 12) Adults with ADHD often have problems in relation to interacting in social relationships, academic functioning and being part of the community at the workplace and performing work tasks; they work harder to perform tasks and strive to be accepted and to be equal members of the community.(13)

The purpose of this thesis is to investigate the consequences of ADHD symptoms in adolescence to mental health as young adult in a Norwegian population. Use of mental health care services, confirmed psychiatric diagnoses, use of health and social benefits and employment/sick leave are compared with the same factors in a control group not defined as expressing ADHD symptoms. The thesis is based on the expression of ADHD symptoms in adolescence, regardless of whether the ADHD diagnosis is confirmed or not.

2 Method

This study is based on the data from The Norwegian Arctic Adolescent Health Study. (NAAHS) was conducted among 10th graders (15-16-years-old) in nearly all junior high schools (292 out of 293) in the three northernmost counties in Norway, in spring 2003-2005. The questionnaires were administered in classroom settings by project staff and completed during two school hours. Students who were absent completed the questionnaires on a later date. The survey was conducted and funded by a joint collaboration between the Centre for Sami Health Research at the University of Tromsø and the Norwegian Institute of Public Health. The Regional Medical Ethical Committee, the Norwegian Data Inspectorate, and the school authorities approved the study.

2.1.1 Sample

All 10th graders (5877) in Northern Norway was invited to participate. A total of 4881(83%) of invited students responded to the NAAHS and consented to the use of data from the survey. 3987 (82%) of the students consented to a future registry linkage, resulting in a 68% sample of all 10th grade students in Northern Norway. (14)

2.1.2 Procedure and questionnaire

The questionnaire in this study included many different subject areas, physical health, living conditions, life events, and sociodemographic relations, and it also included the Strength and Difficulties Questionnaire (SDQ) (15) as a measurement of mental health. In clinical practice symptoms and reduced function both at home and at school are criteria for diagnosing ADHD. The SDQ include a parent, teacher and child/adolescent version. In this survey only the 10th graders answered the self-report SDQ questionnaire. Based on the answers to the questionnaire the algorithms in SDQ generate problem scores in different categories of problems. The SDQ examines 25 attributes, divided between 5 scales: Emotional problems, Conduct problems, Hyperactivity/inattention, Peer relationship

problems and Prosocial behavior. The first four scales are combined to give a total difficulties score(symptom score). The problem scores are grouped in four different levels – “close to average”, “slightly raised”, “high” and “very high”. The SDQ also include an impact supplement that that generate an impact score related to friends, family, classroom learning and leisure activities.(16) The SDQ questionnaire have been found suitable to survey attention and hyperactivity problems.(17-19) In this study the symptom score «very high» (above the 90. Percentile-score within the clinical range) was combined with the impact score “very high” (above the 90. Percentile) to define an ADHD-group within the clinical range (2,4%; n=94, male n=21, and female n=73) The control group in this study (n=3893) consist of all the participants that did not qualify for the ADHD-group with scores in the clinical range.

In 2012, 7-10 years after the initial NAAHS survey was conducted, data from the 3987 participants who consented to future registry linkage were linked to the Norwegian Patient Registry (NPR),(20) a detailed registry from 2008 that includes personal identification of specialized healthcare usage and diagnosis. Available data from specialized healthcare usage and diagnoses from 2008 to 2012 when the participants were 18-20 to 23-25 years of age.

This study is based on data from a general questionnaire about health in a population, and data from linkage to the NPR. In this study the data from NPR best describing the mental health in the research population is analyzed to describe the significant differences between a defined ADHD group and the other responders in the control group.

2.1.3 Ethics

The students and their parents were given written information about the study, and the students provided written consent. The Norwegian Data Inspectorate and the school authorities approved the NAAHS. The Regional Medical Ethical Committee approved the NAAHS and the registry linkage. The Norwegian Institute of Public Health and Statistics Norway carried out the linkage.

2.1.4 Data

The total data material from the NAAHS consist of 3987 participants/cases and excessing 800 different variables. In this study the variables were narrowed down to 16 different variables that were considered best suited to provide a valid indication of the mental health in the two groups compared. 9 of the included variables are directly connected to mental health:

- Psychiatric inpatient treatment
- Psychiatric outpatient treatment
- ADHD/ADD diagnosis
- Developmental and behavioural disorders diagnosis
- Neurosis diagnosis
- Mood disorder diagnosis
- Substance use diagnosis
- Rehabilitation benefits because of psychiatric problem/disorder
- Sick leave because of psychiatric problem/disorder
- Sick leave because of depression

The additional variables are not directly connected to mental health issues, but give an impression of general health and functioning:

- Disability benefits
- Health related welfare benefits
- Non medical benefits
- Economic social benefits
- Unemployment

-Sick leave total

2.1.5 Statistical methods

The combined data from the NAAHS and the data from NPR were plotted in SPSS(Statistical Package for Social Sciences, version 25). The data was analyzed primarily by using the Chi-square test, in variables with expected values lower than 5 the analysis was performed using Fisher's exact test. Independent samples T Test was used to compare means. P-values <0,05 were considered statistically significant.

3 Results

The findings in this study suggest that the group with scores in the ADHD clinical range are significantly more likely to suffer mental health problems later in life. All the included variables indicate statistically significant differences between the two groups compared. Based on the findings it is evident that symptoms of ADHD in adolescence are predict a significantly increased risk in all the included variables.

The statistical findings are presented in Table 1.

3.1.1 Mental health care treatment

The group with scores in the ADHD clinical range group 8,51 % have been admitted to inpatient treatment in psychiatric health care compared to 3,06% in the control group not within the ADHD clinical range (OR 2,95, 95% CI = 1,40 – 6,23, $p < 0,001$)(Table1). In the group with scores in the ADHD clinical range 27 % have received outpatient psychiatric treatment only, compared to 10% in the control group not within the ADHD clinical range (OR 3,43, 95% CI = 2,16 – 5,46, $p < 0,001$)(Table 1). Figure 1 visualize the percentage distribution in mental care treatment.

3.1.2 Psychiatric diagnoses

In the group with scores in the ADHD clinical range group 7,4% have been diagnosed with ADHD/ADD compared to 1,4% in the control group not within the ADHD clinical range (OR 5,51, 95% CI = 2,44 – 12,44, $p < 0,001$)(Table 1). In the group with scores in the ADHD clinical range group 12,8% have been diagnosed with developmental and behavioural disorders compared to 3% in the control group not within the ADHD clinical range (OR 4,68, 95% CI = 2,49 – 8,82, $p < 0,001$)(Table 1). In the group with scores in the ADHD clinical range group 12,8% have been diagnosed with mood disorders compared to 3,9% in the control group not within the ADHD clinical range (OR 3,58, 95% CI = 1,91 – 6,70, $p < 0,001$)(Table 1).

For neuroses and substance use the findings are statistically significant but not in the

$p < 0,001$ level. Because some of the expected values are less than 5 statistical analysis was performed using Fisher's exact test. Findings are presented in Table 1. Figure 2 visualizes the percentage distribution in psychiatric diagnoses.

3.1.3 Rehabilitation benefits and sick leave related to mental health

In the group with scores in the ADHD clinical range 6,38% receive rehabilitation benefits because of a psychiatric disorder compared to 1,16% in the control group not within the ADHD clinical range (OR 5,83, 95% CI = 2,42 – 14,02, $p < 0,001$)(Table 1).

In the group with scores in the ADHD clinical range 14,89% have had sick leave because of psychiatric disorder/problems compared to 4,39% in the group not within the ADHD clinical range (OR 3,81, 95% CI = 2,12 – 6,86, $p < 0,001$)(Table 1).

Figure 3 visualizes the percentage distribution in rehabilitation benefits and sick leave related to mental health.

3.1.4 Health and social benefits

In addition to variables directly connected to mental health some additional was included. To give a better general view on social factors, and also examples from work and education.

In the group with scores in the ADHD clinical range 51,06% have been found to receive health related welfare benefits compared to 26,46% in the group not within the ADHD clinical range (OR 2,90, 95% CI = 1,92 – 4,37, $p < 0,001$)(Table 1). In the group with scores in the ADHD clinical range 3,19% receive disability benefits compared to 0,77% in the control group not within the ADHD clinical range (OR 4,25, 95% CI = 1,27 – 14,16, $p < 0,05$)(Table 1).

In the group with scores in the ADHD clinical range 52,1% received non-medical benefits compared to 28,7% in the control group not within the ADHD clinical range (OR 2,70, 95% CI = 1,79 – 4,08, $p < 0,001$)(Table 1). In the group with scores in the ADHD clinical range 38,3% receive economic social benefits compared to 16,7% in the control group not within the ADHD clinical range (OR 3,09, 95% CI = 2,02 – 4,73, $p < 0,001$)(Table 1). Figure 4 visualizes the percentage distribution in health and social benefits.

3.1.5 Unemployment and sick leave

Unemployment and sick leave give an indication of general health and social functionality. In the group with scores in the ADHD clinical range the average unemployment time in years was 1,82 compared to an average of 0,94 in the control group ($p < 0,001$ using independent samples t-test). In the group with scores in the ADHD clinical range the average number of days of 100% medical sick leave was 52,98 compared to 31,07 in the control group ($p < 0,05$ using independent samples t-test).

3.1.6 Gender differences

In the group with scores in the ADHD clinical range the gender distribution is uneven, the group consist of 21 males and 73 female. The female and male sub-groups was analyzed to find any differences between genders, but no statistically significant differences were discovered.

4 Discussion

The purpose of this study was to investigate mental health in early adulthood in an ADHD group scoring a “very high” impact score combined with a “very high” symptom score on the SDQ self-report questionnaire as adolescents. The results in this study are unambiguous, they show statistically significant increased risk in all the included variables. It is evident that a score in the defined clinical range on self-reported SDQ indicate a statistically significant increased risk of mental problems as young adults. The findings also indicate a higher risk of unemployment and use of health and social benefits compared to controls.

Research in this field is challenging, and available research methods are less diverse than in many other fields. The research material is often not objective, and are based on subjective self-report questionnaires and interviews. This make it challenging to research in this field.

The applied methods in this study give convincing statistical results. The data this study is based on is large, and the data cover many different aspects, but they are not specifically designed to research the development of mental problems from adolescence to adulthood. The variables included in this study have been selected on the background of an assessment of how to best illustrate the possible differences between the compared groups. Maybe other variables should have been included, and maybe some of the ones that are included could have been left out. It is a challenging task to decide and select from the vast information in the available data material, which variables would give the ideal background to give insight into the challenges of transitioning into adulthood concerning mental health.

In this study the two groups were created using the “very high” score combining symptom score and impact score from the SDQ self-report questionnaire. In further research division into different groups with other possible scoring and combinations to get a more elaborate insight.

The findings in this study are consistent with findings in other international studies.(6, 8, 9, 16, 21) However many available studies focus on the persistence of ADHD symptoms into

adulthood, and not necessarily on general health and mental health problems following symptoms in childhood and adolescence. Many studies use the confirmed diagnosis of ADHD as baseline for their research, unfortunately this exclude individuals with symptoms but no confirmed diagnosis.

Other studies have investigated other aspects of long term outcome of ADHD not possible to research in this study, like criminal behavior(22), prevalence of smoking, alcohol and substance use(23) and educational and occupational outcome.(12)

4.1.1 Strengths

Strengths of this study include that the data is collected from a large population of adolescents from Northern Norway. The linkage to the Norwegian Patient Registry is also considered a strength.

4.1.2 Limitations

The basis of all the data collected is the NAAHS. The future linkage to NPR implied that the responders would not be anonymous. Research indicate that sensitive information is more likely to be reported if the respondents are anonymous.(24) The consequences of this might be that some of the responders did not consent to future linkage. This may well be the reason why the number of responders was 241(5,1%) in the ADHD clinical range group among the initial 4881 responders(5), but was reduced to only 91(2,3%) responders in the population of 3987 who consented to future linkage to the NPR.

An SDQ score within the defined clinical range on the self-report questionnaire does not confirm the ADHD diagnosis, it is limited to an indication. The prevalence of ADHD is higher(7,4%) in the defined ADHD group than in the control group(1,4%). This indicate that scoring above the 90. percentile on symptom and impact score predict ADHD, but the majority in this group do not have a confirmed diagnosis as young adults.

4.1.3 Implications

One main background for initiating this study was an interest in the lifelong challenges of ADHD diagnosis. The findings in this study suggest that the confirmed ADHD diagnosis is of less importance in predicting adult outcomes, and that the burden of symptoms possibly revealed by the SDQ self-report questionnaire deserve closer attention and further research to establish a basis for possible interventions.

In a clinical setting the findings might indicate that patients that score high on the SDQ self-report questionnaire will benefit from follow-up even if they do not get the ADHD diagnosis as children/adolescents. Interventions aimed at reducing the adverse effects of ADHD might profitably target prevention or treatment temporally secondary comorbid disorders(25)

The findings in this study strongly indicate that scoring in the clinical range on SDQ predict reduced mental health in adulthood, but it is based on data that are not specifically designed to answers in this study. More research is necessary to get better insight.

5 Conclusion

The purpose of this study was to investigate consequences of having/expressing symptoms of ADHD in adolescence identified with the SDQ self-report questionnaire. The group of participants in this study defined in an ADHD-group within the clinical range are found to have statistically significant higher risk in all the examined variables compared to the control group. Hopefully the findings in this study will inspire and lead to raised awareness and further research in this field.

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7 Tables

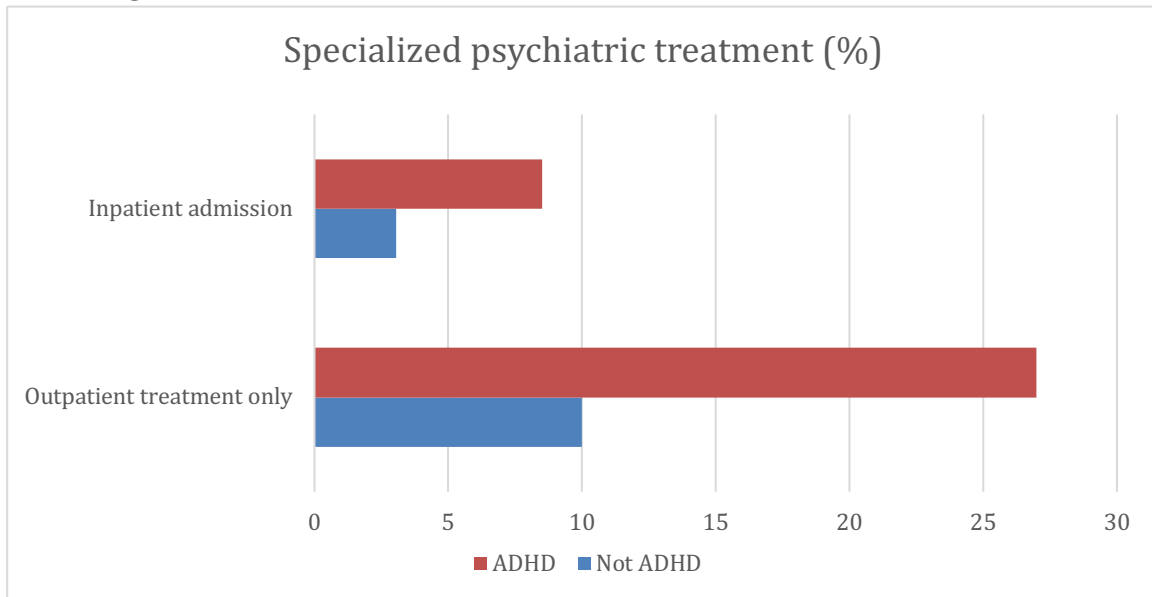
7.1.1 Table 1

Variable tested	Total in the study population(%)	ADHD score in the clinical range (n=94) vs. ADHD score outside clinical range (n=3893)			
		OR	95% CI	P value	
Inpatient admission	3,19	2,95	1,40	6,23	<0,05**
Outpatient treatment	10,43	3,43	2,16	5,46	<0,001*
ADHD/ADD	1,58	5,51	2,44	12,44	<0,001*
Developmental and behavioural disorders	3,26	4,68	2,49	8,82	<0,001*
Neuroses	5,04	3,16	1,73	5,78	<0,05**
Mood disorders	4,14	3,58	1,91	6,70	<0,001**
Substance use	1,60	3,65	1,43	9,32	<0,05**
Rehabilitation benefits because of psych disorder	1,28	5,83	2,42	14,00	<0,001*
Sick leave because of psych dis.	4,64	3,81	2,12	6,86	<0,001**
Sick leave because of depression	1,93	5,96	2,88	12,33	<0,001**
Disability benefits	0,83	4,25	1,72	14,16	<0,05**
Health related benefits	27,04	2,90	1,92	4,37	<0,001*
Non-medical benefits	29,27	2,70	1,79	4,08	<0,001*
Economic social benefits	17,23	3,09	2,02	4,73	<0,001*

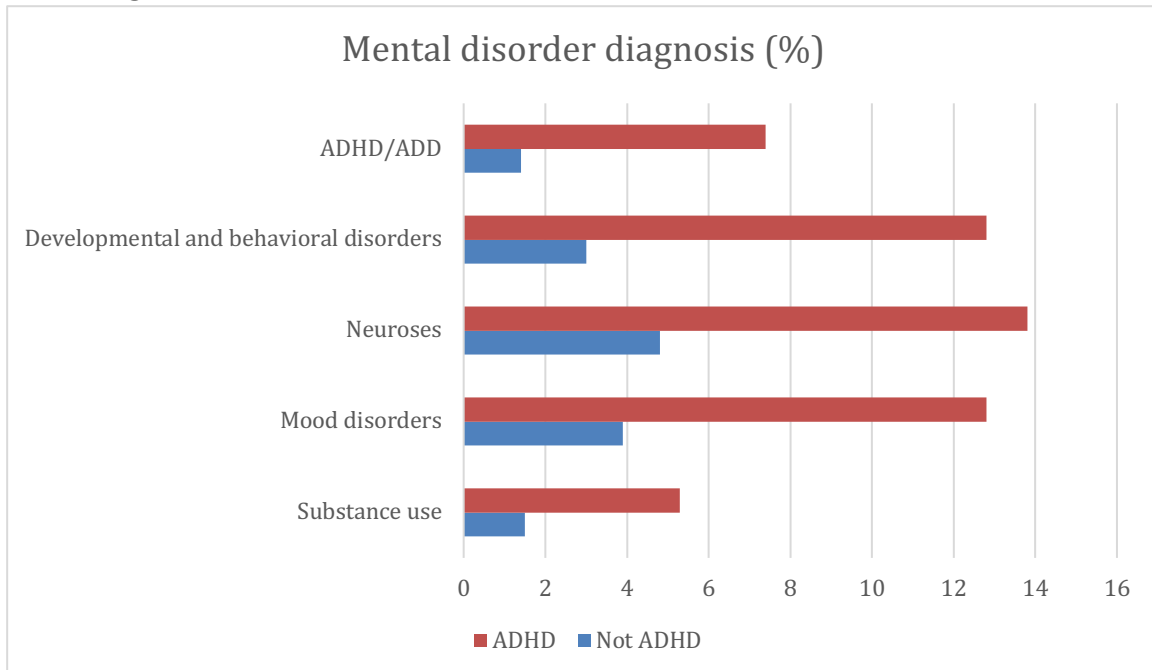
*Chi-square test, **Fisher's exact test

8 Figures

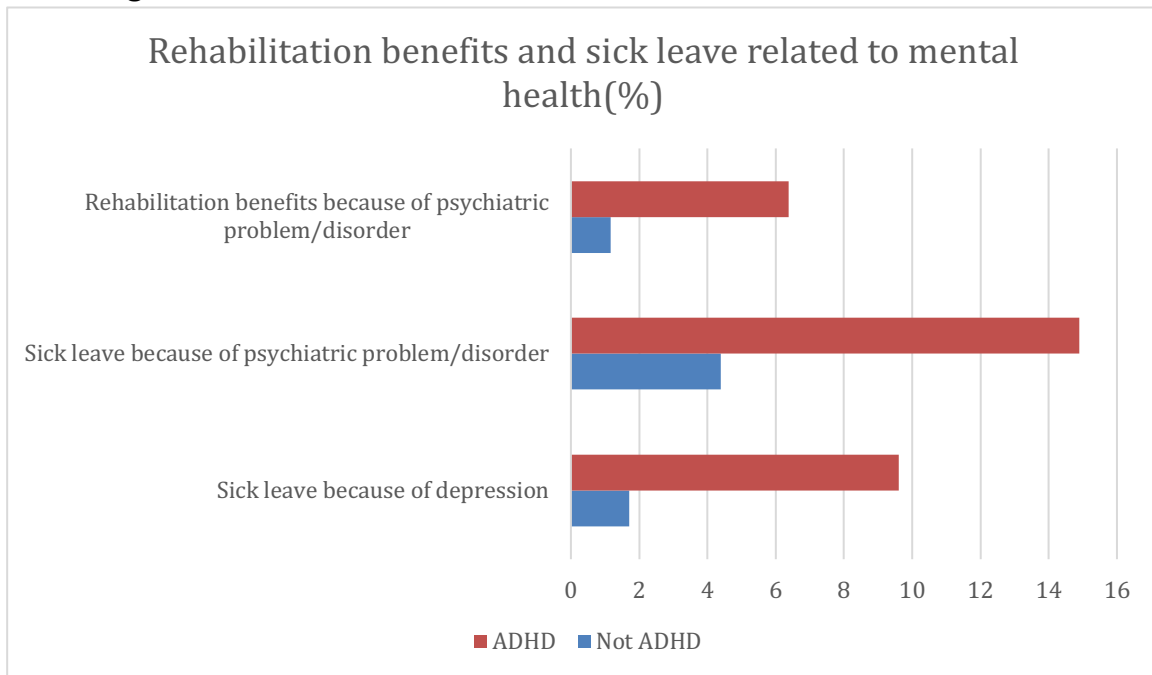
8.1.1 Figure 1



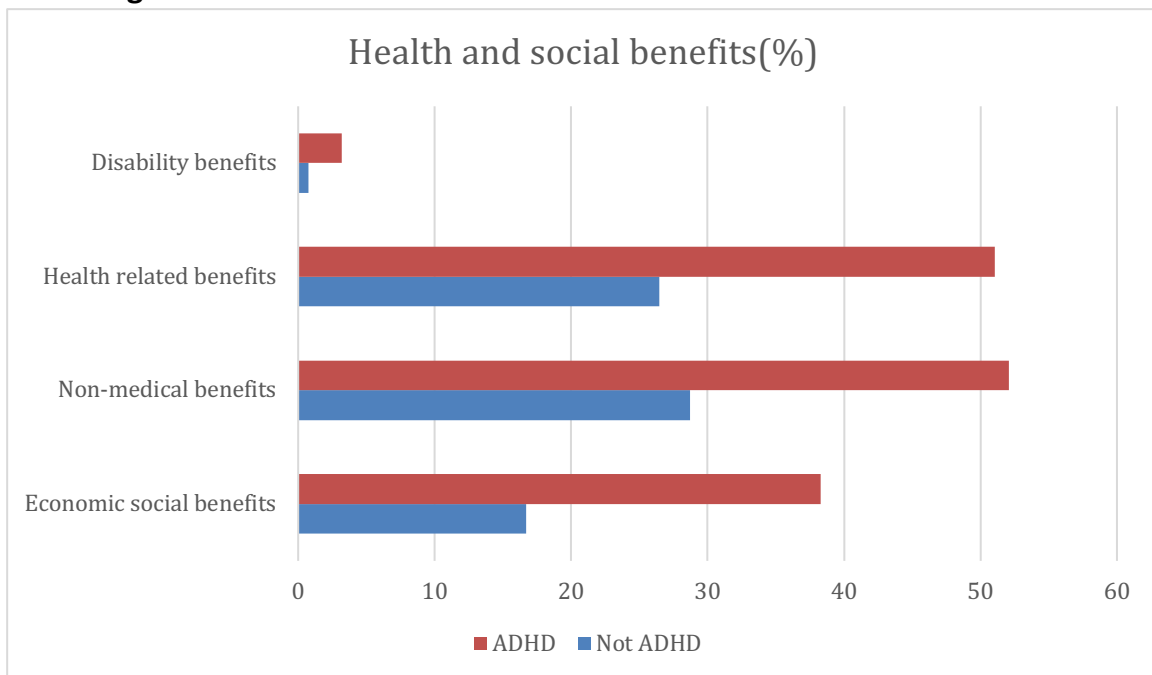
8.1.2 Figure 2



8.1.3 Figure 3



8.1.4 Figure 4



9 GRADE-evaluation

Reference: Mannuzza S, Klein RG, Bessler A, Malloy P, LaPadula M. Adult psychiatric status of hyperactive boys grown up. The American journal of psychiatry. 1998;155(4):493-8.			Design: Prospective	
			Level of documentation	II
			GRADE	⊕⊕⊕
Objective	Method	Results	Diskusjon/kommentarer	
<p>Numerous studies have examined the adolescent and young adult fate of children with attention deficit hyperactivity disorder (ADHD). In marked contrast, relatively little is known about the adult outcome of these children. There have been only two controlled, prospective studies of psychiatric status into adulthood. The present study was conducted to gain further understanding of the natural course of this common childhood condition.</p>	<p>This was a prospective follow-up of clinically diagnosed, white boys of average intelligence who were referred by teachers to a child psychiatric research clinic at an average age of 7.3 years. At a mean age of 24.1 years, 85 probands (82% of the childhood cohort) and 73 comparison subjects (94% of adolescent comparison subjects) were directly interviewed by trained clinicians who were blind to group status.</p>	<p>Evaluations of the probands and comparison subjects indicated significantly higher prevalences of antisocial personality disorder (12% versus 3%) and nonalcohol substance abuse (12% versus 4%) in the probands, whereas mood disorders (4% versus 4%) and anxiety disorders (2% versus 7%) were not significantly different. At adult follow-up, ADHD was rare, occurring in only 4% of the probands (no comparison subjects).</p>	<p>Was the groups recruited from comparable populations? Yes Are the groups comparable on important background factors? Yes Is the case group condition/diagnose adequately validated? Yes Is the control group without the disease/condition? Yes Have the authors considered confounding factors in their design/analysis? No Is exposition to danger/trauma/measures equal in the groups? Unclear Adequate response rate in both groups? Yes Do the authors refer to other sources that strengthen/weaken their findings? Yes Are the results biologically plausible? Yes</p>	
Conclusion				
<p>The results of the present study are consistent with the authors' previously reported major findings. They strongly suggest that children with ADHD are at significantly higher risk for a specific negative course marked by antisocial and substance-related disorders.</p>				
Country				
USA				
Years collecting data				
1970-1987				

Reference: Cheung CHM, Rijdsdijk F, McLoughlin G, Faraone SV, Asherson P, Kuntsi J. Childhood predictors of adolescent and young adult outcome in ADHD. Journal of psychiatric research. 2015;62:92-100.			Design: Follow up
			Level of documentation III
			GRADE ⊕⊕
Objective	Methods	Results	Diskusjon/kommentarer
To identify childhood predictors of ADHD outcome using both dimensional and categorical approaches.	116 adolescents and young adults with childhood ADHD were followed up on average 6.6 years later. ADHD outcome variables were interview-based parent-reported ADHD symptoms and impairment. Childhood predictors included parent- and teacher-rated ADHD symptoms and co-occurring behaviours; actigraph measures of activity level; socio-economic status (SES); and cognitive measures previously associated with ADHD.	Of the sample, 79% continued to meet clinical criteria of ADHD in adolescence and young adulthood. Higher parent-rated ADHD symptoms and movement intensity in childhood, but not teacher-rated symptoms, predicted ADHD symptoms at follow up. Co-occurring symptoms of oppositional behaviours, anxiety, social and emotional problems were also significant predictors, but these effects disappeared after controlling for ADHD symptoms. IQ and SES were significant predictors of both ADHD symptoms and impairment at follow up, but no other cognitive measures significantly predicted outcome.	Was the groups recruited from comparable populations? Yes Are the groups comparable on important background factors? Yes Is the case group condition/diagnose adequately validated? Yes Is the control group without the disease/condition? Yes Have the authors considered confounding factors in their design/analysis? No Is explanation to danger/trauma/measures equal in the groups? Unclear Adequate response rate in both groups? Yes Do the authors refer to other sources that strengthen/weaken their findings? Yes Are the results biologically plausible? Yes
Conclusion			
SES and IQ emerge as potential moderators for the prognosis of ADHD. Childhood severity of ADHD symptoms, as measured by parent ratings and actigraph movement intensity, also predicts later ADHD outcome. These factors should be considered when identifying ADHD children at most risk of poor long-term outcomes and for the development of interventions to improve prognosis.			
Country			
USA			
Years collecting data			
Unclear			

Reference: Hechtman L, Swanson JM, Sibley MH, Stehli A, Owens EB, Mitchell JT, et al. Functional Adult Outcomes 16 Years After Childhood Diagnosis of Attention-Deficit/Hyperactivity Disorder: MTA Results. Journal of the American Academy of Child and Adolescent Psychiatry. 2016;55(11):945-52.e2.			Design: Case-control	
			Level of documentation	II
			GRADE	⊕⊕⊕
Objective	Method	Results	Diskusjon/kommentarer	
<p>To compare educational, occupational, legal, emotional, substance use disorder, and sexual behavior outcomes in young adults with persistent and desistent attention-deficit/hyperactivity disorder (ADHD) symptoms and a local normative comparison group (LNCG) in the Multimodal Treatment Study of Children with ADHD (MTA).</p>	<p>Data were collected 12, 14, and 16 years postbaseline (mean age 24.7 years at 16 years postbaseline) from 476 participants with ADHD diagnosed at age 7 to 9 years, and 241 age- and sex-matched classmates. Probands were subgrouped on persistence versus desistence of DSM-5 symptom count. Orthogonal comparisons contrasted ADHD versus LNCG and symptom-persistent (50%) versus symptom-desistent (50%) subgroups. Functional outcomes were measured with standardized and demographic instruments.</p>	<p>Three patterns of functional outcomes emerged. Post secondary education, times fired/quit a job, current income, receiving public assistance, and risky sexual behavior showed the most common pattern: the LNCG group fared best, symptom-persistent ADHD group worst, and symptom-desistent ADHD group between, with the largest effect sizes between LNCG and symptompersistent ADHD. In the second pattern, seen with emotional outcomes (emotional lability, neuroticism, anxiety disorder, mood disorder) and substance use outcomes, the LNCG and symptom-desistent ADHD group did not differ, but both fared better than the symptompersistent ADHD group. In the third pattern, noted with jail time (rare), alcohol use disorder (common), and number of jobs held, group differences were not significant. The ADHD group had 10 deaths compared to one death in the LNCG.</p>	<p>Was the groups recruited from comparable populations? Yes Are the goups compareable on important background factors? Yes Is the case group condition/diagnose adequately validated? Yes Is the controll group without the disease/condition? Yes Have the authors considered confounding factors in their design/analysis? No Is exponation to danger/trauma/measures equal in the groups? Unclear Adequate response rate in both groups? Yes Do the authors refer to other sources that strengthen/weaken their findings? Yes Are the results biologically plausible? Yes</p>	
Conclusion				
<p>Adult functioning after childhood ADHD varies by domain and is generally worse when ADHD symptoms persist. It is important to identify factors and interventions that promote better functional outcomes.</p>				
Country				
USA				
Years collecting data				
<p>16 years from baseline, unclear exactly when.</p>				

Referanse: Bjerrum MB, Pedersen PU, Larsen P. Living with symptoms of attention deficit hyperactivity disorder in adulthood: a systematic review of qualitative evidence. JBI database of systematic reviews and implementation reports. 2017;15(4):1080-153.			Design: Systematic review	
			Level of documentation	1b
			GRADE	⊕⊕⊕
Objective	Methods	Results	Diskusjon/kommentarer	
To identify and synthesize the best available evidence on how adults experience living with ADHD.	<p>Types of participants Adults with confirmed ADHD diagnosis.</p> <p>Phenomena of interest How adults with ADHD experience and manage the symptoms of ADHD and links between protective factors provided by relatives, friends, fellow students, mentors and colleagues.</p> <p>Types of studies Studies based on qualitative data, including, but not limited to, designs within phenomenology, grounded theory, content analysis or ethnography.</p> <p>Search strategy A three-step search strategy identified published and unpublished qualitative studies from 1990 to July 2015.</p> <p>Methodological quality Studies meeting the inclusion criteria were independently assessed by two reviewers using the standardized critical appraisal instrument from the Joanna Briggs Institute Qualitative Assessment and Review Instrument (JBI-QARI).</p> <p>Data extraction Data were extracted from 10 included studies using the JBI-QARI.</p> <p>Data synthesis Qualitative research findings were synthesized using the JBI-QARI.</p>	<p>A total of 103 findings from 10 studies were aggregated into 16 categories that were meta-synthesized into four synthesized findings: “Adults are aware of being different from others and strive to be an integrated, accepted part of the community;” “Adults with ADHD are creative and inventive;” “Adults with ADHD develop coping strategies in striving for a healthy balance in life” and “For adults with ADHD, accomplishing and organizing tasks in everyday life is a challenge but it can also be rewarding.”</p>	<p>Was the groups recruited from comparable populations? No</p> <p>Are the groups comparable on important background factors? Yes</p> <p>Is the case group condition/diagnose adequately validated? Yes</p> <p>Is the control group without the disease/condition? Yes</p> <p>Have the authors considered confounding factors in their design/analysis? No</p> <p>Is exposure to danger/trauma/measures equal in the groups? Yes</p> <p>Adequate response rate in both groups? Yes</p> <p>Do the authors refer to other sources that strengthen/weaken their findings? Yes</p> <p>Are the results biologically plausible? Yes</p>	
Conclusion	<p>Adults with ADHD have problems stemming from ADHD symptoms in relation to interacting in social relationships, academic functioning and being part of the community at the workplace and performing work tasks; they work harder to perform tasks and strive to be accepted and to be equal members of the community. Protective factors that support their ability to manage daily life with ADHD are personal strategies such as reminders and performing tasks within a given structure. Others close to them can assist by coaching, reminding them of appointments and so on. Superiors can assist by structuring the work tasks and setting up clear rules and limits for the tasks. Medication has proven to be very useful as it leads to less hyperactivity and enhances ability to stay focused and become organized. Finally, insight into ADHD has a positive impact on the ability to manage the consequences of ADHD. Health professionals should, when advising adults with ADHD, fundamentally see them as persons who have a problem and not as problem persons, emphasize strategies adults themselves can apply such as structuring everyday tasks and informing them about positive effects and possible side effects of medication. Policy-makers could launch campaigns targeted at employers with information about the competencies adults with ADHD possess and how employers can benefit from these by structuring work tasks. When promoting employees with ADHD, it should be to positions with more advanced hands-on functions and not positions with administrative duties.</p>			
Country	USA			
Year	2017			

Reference: Madsen AG, Dalsgaard S. Prevalence of smoking, alcohol and substance use among adolescents with attention-deficit/hyperactivity disorder in Denmark compared with the general population. Nordic journal of psychiatry. 2014;68(1):53-9			Design: Case-control	
			Level of documentation	II
			GRADE	⊕⊕⊕
Objective	Method	Results	Diskusjon/kommentarer	
<p>To test whether adolescents with ADHD in pharmacological treatment have a higher prevalence of smoking and use of alcohol and drugs than a matched control group from the general population. The study will also analyse associations between smoking, alcohol and drug use and comorbid psychiatric symptoms.</p>	<p>The sample in this case–control study comprised 219 adolescents aged 13–18 years, including a case group of 117 adolescents with ADHD and a control group of 102 adolescents without ADHD. Participating subjects completed a questionnaire about their use of cigarettes, drugs and alcohol and the self-report version of the Strengths and Difficulties Questionnaire (SDQ).</p>	<p>21% of ADHD probands vs. 16% controls were daily smokers ($P = 0.326$). Among alcohol users, 52% of ADHD probands vs. 70% controls confirmed monthly alcohol intake ($P = 0.014$); 4% of cases compared with 7% of controls used illicit drugs within last month ($P = 0.260$). Contrary to expectations, this study showed that adolescents in the control group without ADHD had a higher risk of having ever tried either smoking cigarettes, drinking alcohol or used illicit drugs. Controls also had a more frequent use of alcohol than adolescents who were in pharmacological treatment for ADHD. ADHD probands on the other hand were more likely to become daily smokers than controls and they seemed to have a heavier use of illicit drugs than controls.</p>	<p>Was the groups recruited from comparable populations? Yes</p> <p>Are the groups comparable on important background factors? Yes</p> <p>Is the case group condition/diagnose adequately validated? Yes</p> <p>Is the control group without the disease/condition? Yes</p> <p>Have the authors considered confounding factors in their design/analysis? No</p> <p>Is exposition to danger/trauma/measures equal in the groups? Yes</p> <p>Adequate response rate in both groups? Yes</p> <p>Do the authors refer to other sources that strengthen/weaken their findings? Yes</p> <p>Are the results biologically plausible? Yes</p>	
Conclusion				
<p>No significant group differences were found in the prevalence of ever having smoked cigarettes, drinking alcohol or using illicit drugs between adolescents with ADHD and controls. Contrary to expectations, subjects in the control group had a more regular and heavier use of alcohol. However, ADHD patients had a heavier use of cigarettes than controls.</p>				
Country				
<p>Denmark</p>				
Years collecting data				
<p>2011</p>				