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YOUTH



**Development and manifestation of behavior problems and
risk behavior among Icelandic youth**

Sandra Sif Sæmundsdóttir

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Author name: Sandra Sif Sæmundsdóttir

Author ID number: 091090-2019

Supervisor name: Berglind Sveinbjörnsdóttir

Department of Psychology

School of Business

Forewords and acknowledgments

This thesis was submitted in partial fulfilment of the requirements of the MSc Clinical Psychology degree, Reykjavik University. Written and presented in the style of an article for submission to a peer-reviewed journal. This thesis presents a culmination of work and research that was conducted over three semesters as a part of a master's program. In the first semester, a literature review was written about at-risk youth and those factors that are associated with greater risk of substance use and delinquency. In the second semester, the research project was fully formalized and collaboration with the organization Olnbogabörn was established. Appropriate permits were obtained from The National Bioethics Committee of Iceland and The Data Protection Authority of Iceland for conducting a research through a questionnaire. Data acquisition, data processing and writing of the final project took place in the third/last semester.

The idea and interest for this project came partially from previous master's degree in Criminology. Criminal activity is costly for the community, the individual himself, his family and his victims. It is important to identify factors that have been associated with higher risk of criminality and target those at higher risk for preventative intervention. Children with behavior problems have been found to be at higher risk of further behavior problems, including substance use and criminal activity. Early intervention increases the likelihood of preventing further development of problem behavior and can aid high-risk youth towards a more wholesome life. I wanted to study at-risk youth to gather information about this group, their characteristics, their behavior problems and implemented treatments. With hope of giving certain indications about this group and idea of what children are in more need of preventative or early intervention as well as gather information about what treatments are effective for children at-risk.

I have been lucky to meet and get to know professionals that work with children with

behavior problems as well as families of these children through my studies in Clinical Psychology. Some family members feel lost and hopeless were the implemented treatments are not giving desirable outcome. There is often a requirement of diagnosis for a child to receive assistance in school and referral to other resources. Based on my experience I feel like people (both family members and professionals) don't see a real benefit in ODD diagnosis. It only adds to the list of possible explanations for problem behavior but doesn't guide treatment or increase possible treatment resources. This made me want to examine ODD specifically to see whether the diagnosis affected the development of the problem and if there is an increased need to take ODD diagnosis more seriously and provide better and more individualized treatment. Research show these children to be in increased risk of more serious and persistent behavior problems that can last throughout life. This matter and research is my concern both for my interest of criminality as well as because a child that is dear to me has this diagnosis and has shown behavior problems from young age. My experience is lack of treatment and understanding of this diagnosis. Feeling that most people see ODD diagnosis as a conformation and label of troubled child.

This research has been a long but pleasant journey. Many good people have made it easier and better. I would like to thank my supervisor, Berglind Sveinbjörnsdóttir, for her guidance, encouragement and advice in completing this work. I also want to thank the organization Olnbogabörn for their collaboration and those who participated in the study receive my highest gratitude. I would like to thank my family and friends for patience and encouragement during my studies and my classmates for constant support. Special thanks go to my aunt, Dr. Berglind Gísladóttir, who has given me constant support, guidance and help throughout my studies, first in BSc in Psychology, then MSc in Criminology and Criminal Justice and now in MSc Clinical Psychology. She has always given me time, despite her busy schedule, to encourage me, proofread my thesis papers and give helpful advices.

Abstract

The majority of children and adolescents that show risk behavior, such as substances use and participate in antisocial and criminal activity, exhibit behavior problem in early childhood. These children are more likely to meet diagnostic criteria for disruptive disorders (e.g. ADHD, Oppositional Defiant Disorder (ODD) and Conduct disorder (CD)). In addition, ODD has been found to be strongly associated with later Conduct disorder and criminal activity. A growing body of evidence suggests that the seriousness, duration and consequences that stem from behavior problems are associated with early onset. Thus, it is important to intervene when behavior problems are apparent. Early intervention increases the likelihood of preventing further development of problem behavior and the development of conduct disorder. The purpose of this study was to gather information about children/adolescence at-risk in Iceland and assess if diagnosis and age of onset of behavior problems were related to earlier onset of substance use and delinquent behavior as well as assess the perceived usefulness of implemented treatments and if the perceived usefulness differ for different diagnosis. A questionnaire was administered to parents or legal guardians of children that have shown risk behavior in Iceland. Majority of participants were first aware of their children behavior problem before the age of 8. Those diagnosed with ODD were significantly more likely to have onset of behavior problem before the age of 8 years old and were more likely to have earlier onset of substance use and delinquency. Parents and legal guardians of high-risk youth did not perceive implemented treatments to be useful.

Keywords: At-Risk Youth, substance use, delinquency, behavior problems, disruptive disorders, Oppositional Defiant Disorder.

Development and manifestation of behavior problems and risk behavior among Icelandic youth

Behavior problems in youth can have serious effect on an individuals' life. Such problems can increase the likelihood of rejection by peers, confrontations with caretakers, academic difficulties, substances use and participation in antisocial and criminal activity (Burke, Loeber & Birmaher, 2002; Coie & Dodge, 1998; Kazdin, 1995;). Behavior problems do not only effect children during their childhood years but can also have numerous problematic outcomes in their adulthood (Jaffee, Belsky, Harrington, Caspi & Moffitt, 2006). Aggression and other behavior problems during childhood are among the strongest predictors for later substance abuse (Hawkins, Catalano & Miller, 1992) and for offending (Burke, Loeber & Birmaher, 2002). Kratzer and Hodgins (1997) followed a birth cohort of 12717 participants from pregnancy through the age of 30. They found that childhood behavior problems had a strong association with criminal activity and mental disorders in adulthood. More specifically, three of every four male participants that had shown behavior problems in childhood, participated in criminal activity in adulthood.

It is evident that children who exhibit high levels of anger and aggressive and disruptive behavior will have more difficulties throughout life. Children with such problems are often less prepared for academic work when entering school and are more likely to fail at school tasks (Coie, Dodge, & Kupersmidt, 1990). Behavior problems can also decrease social competence and increase the likelihood of conflicts with others and peer rejection (Eisenberg et al., 2001; Eisenberg, et al., 2000). Children that are rejected by peers and have academic difficulties are again more likely to eventuate in serious adolescent delinquency. The probability is higher for children that exhibit anger, aggressive and disruptive behavior than for children who show aggressiveness alone (Coie & Dodge, 1998). In addition, children who are constantly in confrontations with parents and teachers and experience chronic

academic failure and peer rejection are more likely to interact with deviant peer groups and engage in more severe and frequent criminal activity in their adolescence (Thornberry, Lizotte, Krohn, Farnworth, & Jang, 1994). If not intervened in time their criminal and antisocial activity can be particularly resistant to interventions (Kazdin, 1995). Identification of factors that are related to the onset of behavior problems could be helpful to identify children in more need of early intervention.

Behavior problems and disruptive disorders

Children who show aggressive and disruptive behavior are more likely to get diagnosed with conduct disorder and other disruptive disorders (Burke, Loeber & Birmaher, 2002). In addition, majority of adolescents who exhibit behavior problems are likely to have exhibited problem behavior in preschool and meet diagnostic criteria for attention deficit and hyperactive disorder (ADHD) and/or oppositional defiant disorder (ODD) before the age of nine (Lahey et al., 1998). Those who are diagnosed in childhood are in more risk of violent behavior and for psychological problems in adulthood than those who are diagnosed as adolescents (NolenHoeksema, 2007).

Diagnosis of disruptive disorder is predictive for various behavior problems and poor adjustment later in adolescence and adulthood (Kessler, Foster, Saunders & Stang, 1995; Kim-Cohen et al., 2003). Three disorders are listed as disruptive behavior disorders in DSM-5: attention-deficit/hyperactivity disorder (ADHD), oppositional defiant disorder (ODD) and conduct disorder (CD) (American Psychiatric Association, 2013). The prevalence of each of these disorders ranges from 1% to 8% of the population (Costello, Mustillo, Erkanli, Keeler, & Angold, 2003; Verhulst, van der Ende, Ferdinand, & Kasius, 1997) and the disorders often co-occur (e.g., American Psychiatric Association, 2013).

The characteristics of ADHD is impulsive behavior, inappropriate levels of attention problems and motor hyperactivity. ODD is characterized by high and inappropriate levels of

irritability, disobedience, aggression and intentional annoyance of others (Lahey, McBurnett & Loeber, 2000). Children with ODD have little control over their emotions and their symptoms can result in mental distress (Ezpeleta et al., 2012) as well as affecting their academic achievements and social relationships (Barry, Marcus, Barry & Coccaro, 2013). CD was long considered to be an extended and more extreme version of ODD. Many children with ODD meet the diagnostic criteria of CD in late childhood or early adolescence (Barry, Marcus, Barry & Coccaro, 2013). The characteristics of CD is antisocial behavior like persistent levels of lying, violence, stealing and vandalism, often apparent in early adolescence (Lahey, McBurnett & Loeber, 2000). Children with CD have serious behavior problems and this diagnosis has been shown to be one of the most robust predictors for serious offending (Lipsey & Derzon, 1998). Namely, the most prevalent diagnosis among justice involved youth is CD, ranging from 50% to 90% (Shufelt & Cocozza, 2006; Wierson, Forehand & Frame, 1992). In Robertson et al. (2004) study on 482 incarcerated juveniles, 12-28% had ADHD diagnosis, 14-25% had ODD and 39-51% had CD depending on their gender. The prevalence of these disorders is much higher among justice involved youth (Robertson, Dill, Husain & Undesser, 2004; Shufelt & Cocozza, 2006) compared to community samples. Systematic review of research on community prevalence of mental disorders in children and adolescent showed that the prevalence of ADHD is 3.4% (CI95% 2.6-4.5) and the prevalence of any disruptive disorder is 5.7% (CI95% 4.0-8.1) (Polanczyk, Salum, Sugaya, Caye & Rohde, 2015).

Symptoms of ADHD and ODD can often be apparent in preschool and mark high risk of a more serious externalizing behaviors in middle childhood, including early onset conduct disorder (CD), delinquency, and aggression (Campbell, Shaw, & Gilliom, 2000). Majority of boys with CD also meet the criteria of ODD (Lahey, McBurnett, & Loeber, 2000; Loeber, Green, Keenan, & Lahey, 1995). Both ADHD and ODD have been found to be associated

with CD but a few recent studies have shown that ODD is a much stronger predictor of the onset of CD (Costello et al., 2003; Lahey et al., 2000; Lahey, Loeber, Burke, Rathouz, & McBurnett, 2002; Loeber, Green, Lahey, Frick, & McBurnett, 2000). When the association of these comorbid disorders is examined further and ADHD and ODD are studied simultaneously the association of ADHD and CD becomes weaker (Lahey & Loeber, 1994; Lahey, Waldman, & McBurnett, 1999b). Identifying the factors that have been associated with higher risk of CD could help detect and target a population for preventive intervention (Gordon, 1983; Lahey, Loeber, Burke, Rathouz & McBurnett, 2002).

Onset of behavior problem

A growing body of evidence suggests that the age that individuals start to engage in behavior problems is associated with the seriousness and duration of the problem and the severity of the consequences that follow (Farrington et al., 1990; Lahey et al., 1999a; Loeber & Farrington, 2000). Individuals who show antisocial or delinquent behavior at early ages have greater numbers of offenses and are more likely to persist in criminal activity longer into adulthood, or throughout life, than those who start committing the same crimes at later ages (Farrington et al., 1990; Loeber & Farrington, 2000). Early disruptive behavior like temper tantrums and aggression that is more frequent and severe than of children of the same age can be an important warning signs for later problems. Although majority of antisocial youth has a history of challenging behavior (Loeber & Farrington, 2000) it does not mean that preschoolers that are noncompliant, overactive and aggressive continue to show behavior problems when older or that they will become child delinquents. A taxonomic theory of the age and crime was put forth by Moffitt (1993; 2017) where offenders were put in two separate groups depending on the onset of antisocial behavior. The first group were those who engaged in antisocial behavior early in life and the second group were those individuals whose onset of antisocial behavior occurred in their adolescence. Early onset of antisocial

behavior results in a more persistent and serious behavior and is more likely to lead to offences later in life that are unlikely to desist. When the onset of antisocial behavior occurs during adolescence, it is more likely to be due to prestige and deviant peer affiliations (Piquero & Chung, 2001). Studies have shown that girls are less likely to be in the early onset group were most girls fall into adolescent onset group. The rarity of girls in the early-onset group is thought to be partly explained by girls being less likely to show risk factors such as hyperactivity and aggression in childhood (Moffitt & Caspi, 2001).

Since behavior problem that arises in early childhood can have serious impact on individual's life, it is reasonable to assume that a successful early intervention program could have an effect on crime rates and help high-risk youth towards a more socially responsible path in life (Greenwood, 2008). Furthermore, a successful early intervention program can aid high-risk youth towards a wholesome life and hopefully reduce the likelihood of substance abuse and a criminal path.

Interventions to reduce behavior problems

Early intervention increases the likelihood of preventing further development of problem behavior and the development of conduct disorder (Carr & Horner, 2007; Loeber et al., 2000). Disruptive behavior is the most common reason for referrals of preschool children for mental health services. Family functioning and parenting practices have a great effect on children's outcome in life and are therefore ideal for intervention (Wasserman & Seracini, 2001). Some school programs have been effective in reducing disruptive behavior (Herrenkohl et al., 2001). An example of an effective school program is the Good Behavior Game (GBG) (Kellam et al., 2011). GBG involves group-oriented contingency management strategies for behavior modification. The program has been found to be effective in reducing aggressive and disruptive behavior in classrooms. A study on the long-term effectiveness of GBG, with a follow up at the ages of 19-21, found those who had participated in GBG to

have significantly lower rates of substance use, antisocial behavior and delinquency (Kellam et al., 2011).

Most school programs aim to increase social skills and promote skills that are incompatible with aggression. Social skill training has been found to be an effective way to reduce behavior problems, substance abuse and delinquency of children and adolescents, and promotes social competence (e.g., Ang and Hughes, 2002; Beelmann, Pfingsten and Lösel, 1994; Kazdin, 1997; Wilson, Gottfredson and Najaka, 2001; Wilson, Lipsey and Derzon, 2003). However, studies on social skills training have not been able to fully generalize their results to broader construct, like peer acceptance, and there is a lack of follow up studies to show long term effect (Beelmann et al, 1994; Beelmann & Lösel, 2006). Since behavior problems usually arise before the age of 8 (López-Villalbos et.al., 2014) and large part of children's life is spent at school, programs conducted in school can be helpful in reducing behavior problems and help individuals to achieve in school and to have positive interaction with others.

Another treatment that has been found to be effective in reducing behavior problems by targeting factors that are associated with behavior problem is Cognitive-behavioral therapy (CBT). CBT has been found to be effective in decreasing aggression, anger and irritability in children and adolescents (Sukhodolsky et al., 2016). The therapy aims at improving anger control skills, emotion regulation and social problem solving associated with aggressive behavior (Sukhodolsky et al., 2016).

Children and adolescents who show persistent disruptive behavior, truancy and underage drinking are normally referred to child welfare agencies. These agencies are often overloaded, with long waiting lists and are often understaffed. Therefore, all referred cases need to be prioritized were those in physical risk are given priority (Loeber & Farrington, 2000). Unfortunately, this system results in many children and adolescents going without

treatment until their problem has gotten worse and more persistent. Interventions that are specifically aimed at and have been found to be effective for disruptive and delinquent adolescents include parent management training (PMT), functional family therapy and multisystemic therapy (MST) (Wasserman & Seracini, 2001). PMT goal is to improve and increase the frequency of positive parenting skills and reduce reactions or consequences that maintain non-compliance, tantrums and aggression (Sukhodolsky et al., 2016) and consequently improve child/adolescent behavior (Kaminski & Claussen, 2017). This intervention has resulted in significant reduction of non-compliance and behavior problems when applied in early childhood (Beauchaine *et al.*, 2005; Kaminski & Claussen, 2017). MST is for children from the age of 10 to 17 with severe behavior problems. The therapy focuses on personal, family and academic factors or all social systems surrounding the individual promoting changes to reduce behavior problems (Littell, Campbell, Green & Toews, 2005). MST has been found to reduce behavior problems, improve family functioning and decrease the likelihood of further delinquency and arrests (Hipwell & Loeber, 2006).

It is important for families and school to intervene when behavior problems are apparent because the child is in increased risk of further behavior problems, including future substance use and offending. Everyone working with children and adolescents needs to be aware of risk factors and apply or refer children to appropriate and useful treatment when behavior problems appear. It is also important to assess treatments or interventions available to gather information about its usefulness and to see if certain group of children/adolescents are not benefiting from these treatments.

In summary, the literature and previous research suggest that early onset of behavior problems and diagnosis of ODD is predictive of serious outcomes and development of CD. Children with ODD are also more likely to show behavior problems in early childhood as well as being more likely to develop CD which has been found to be highly associated with

delinquency. Thus, indicating the importance of targeting children with ODD diagnosis to provide them with appropriate and effective resources/treatments to reduce the likelihood of development of CD and poor outcome.

Goals and purpose of present study

The present study focused on a sample of at-risk youth in Iceland. The goal was to gather information on the onset of behavior problem, substance use and delinquent behavior as well as their diagnosis and the perceived usefulness of implemented treatments. The purpose was to assess (1) if ODD diagnosis was related to earlier onset of behavior problems, substance use and delinquent behavior, (2) whether children with early onset of behavior problems are more likely to show certain set of behavioral-temperament factors than those with a later onset, (3) what is the perceived usefulness of an available and implemented treatments for behavior problems and if the perceived usefulness differs for different diagnosis.

Method

Participants

All participants were members of the organization Olnbogabörn, which is an organization for parents and family members of children that exhibit risk behavior. Participants were 52 parents or legal guardians of children that show risk behavior in Iceland. In this study risk behavior was defined as high levels of behavior problems such as aggressiveness towards others, frequent violation of rules, substance use and criminal activity. The age of the children of participants ranged from 13 years old to 28 years old ($M = 18.1$; $SD 3.8$). The gender ratio was 45.5% girls and 54.5% boys. Majority of the participants in the study were located in the greater capital area of Iceland, or 69.2%, and 30.8% lived in rural areas of Iceland.

Procedure

The study was approved by The National Bioethics Committee of Iceland and complied with all regulations of the Data Protection Authority of Iceland (Consent number: 18-162-S1). Data for the study was gathered with a questionnaire that was administered in 2019 to parents/legal guardians of children that have shown risk behavior in Iceland. A link to an online survey was sent to a contact at the organization Olnbogabörn. The contact sent the link forward to all members of Olnbogabörn through a closed online website/group for members of the organization in January of 2019. The contact also posted regular reminders of the survey to the website/group until the end of March. The questionnaire included background questions, diagnosis of disorders, information about when problem behavior started, embodiment of the problem behavior, what treatments had been implemented, and if parents/legal guardians found any treatment to be helpful. Participants were informed of the purpose of the study and how the data would be gathered and stored. Participants were also informed that they could at any time cease participation and that if the questions caused them any distress, a psychologist would be made available for them, free of charge. A total of 52 answers were received from parents/legal guardians of children showing risk behavior. Accurate response rate is unknown because Olnbogabörn also includes relatives or other family members of children showing risk behavior. All responses to the questionnaire were anonymous and none of the information was traceable to specific participants.

Measures

Onset of behavior problem.

Onset of behavior problem was measured with one question were participants were asked when they were first aware of their child's behavior problem. Behavior problem was defined as destructive behavior, frequent tantrums, aggression, physical fighting and frequent and intentional rule breaking. The answer options were "Before the age of 2", "Between the

age of 2-3 years old”, “Between the age of 4-5 years old”, “Between the age of 6-7 years old”, “Between the age of 8-9 years old”, “Between the age of 10-11 years old” and “12 years old or older”.

Onset of substance use.

Substance use was measured with the question “If your child has used substances, at what age was your child when it first used?”. Answer options were “Don’t know”, “Hasn’t used substances to my knowledge” and a column where a specific age could be written.

Onset of criminal activity/ delinquency.

Criminal activity was measured with the question “If your child has participated in criminal activity, at what age was your child when it first broke the law?”. Answer options were “Don’t know”, “Hasn’t participated in criminal activity to my knowledge” and a column where a specific age could be written.

Diagnosis.

Participants were asked if their children had any diagnosis. This was a multiple answer question and participants could mark more than one choice. Participants were asked to mark all that applied to their child. Answer options were „No formal diagnosis” or select a diagnosis from a list, including “ADHD”, “Anxiety”, “ODD”, “Depression”, “CD”, “Autism”, “Developmental delay” and “Other”. The questions were coded with 1 for having specific diagnosis and 0 for not having the diagnosis.

Perceived usefulness of treatments.

Perceived usefulness was measured on a 5 point Likert scale. Offering positive, negative and neutral response where 1 stood for „very un-useful“, 2 „rather un-useful“, 3 „neither un-useful nor useful“, 4 „rather useful“ and 5 „very useful“. Participants rated the treatments their child had used. A mean score of perceived usefulness was calculated for each participant where all scores were summed and divided with the number of treatments used.

Statistical analysis

All data was registered and analyzed with the software SPSS Statistics. Descriptive statistics was used to describe and summarize the characteristics of the data. A chi-square test of independence was performed to examine the relation between variables. The relationship examined was between (1) the onset of behavior problem and diagnosis of ODD, (2) the most common behavior-temperament factors present before the age of 10 and having ODD diagnosis, (3) mean score of perceived usefulness of treatments and ODD diagnosis. An independent-measures t-test was conducted to determine if there was a statistically significant difference between the mean score of perceived usefulness of treatments for different diagnosis as well if there was a significant difference in the frequency of implemented treatments for different diagnosis (Field, 2009). Special emphasis was on children with ODD diagnosis and whether or not they were more likely to have had more treatments and lower mean score of perceived usefulness than children with other diagnosis.

Results

In total, 69 answers were collected thereof 52 from parents or legal guardians of children showing risk behavior. Those who were not parents or legal guardians were excluded from the study (17 answers). The majority of participants, or 85.0%, said that their child had been in substance use and 65.0% said their child had participated in criminal activity. The mean age of onset for substance use was 13.85 (ranging from 11 to 16) and the mean age of onset of criminal activity was 12.95 (ranging from 7 to 17). The majority (61.4%) of participants were first aware of their children's behavior problem before the age of 8 and around 41% of participants were first aware of their children's behavior problem between the age of 4 - 7 years old (22.7% at the age of 4-5 years old and 18.2% at 6-7 years old). Almost 28% of the participants said their children's behavior problem was first apparent around or after the age of 12. Almost all children of participants, or 94.9%, had diagnosis of

some disorder and 67.5% had two or more diagnoses. The most prevalent diagnosis was ADHD (see table 1).

Table 1. *Number and proportion of answers from participants on their child's diagnosis.*

Diagnosis	Count (N)	Percentage (%)	Mean age when diagnosed
Attention deficit hyperactivity disorder (ADHD)	23	59.0%	9.91
Anxiety	22	56.4%	11.86
Oppositional defiant disorder (ODD)	15	38.5%	10.4
Depression	15	38.5%	*
Conduct disorder (CD)	6	15.4%	9
Autism	5	12.8%	14.75
Developmental delay	4	10.3%	12.6
Other	11	28.2%	12.88
No formal diagnosis	2	5.1%	-

Note. This was a multiple answer question and participants (N=39) could mark more than one choice.

*Question about the age of diagnose of depression was missing from the questionnaire.

Table 2 depicts the onset of behavior problem based on diagnosis. The majority (81.8%) of children diagnosed with both ODD and ADHD showed behavior problems before the age of 8. Most children with ODD were also diagnosed with ADHD. Children with ODD diagnosis, not ADHD, did all show behavior problems before the age of 8. Onset of behavior problems for those diagnosed with other diagnosis or ADHD (not ODD) was similarly distributed before and after the age of 8. There was a significant relationship between ODD diagnosis and onset of behavior problem ($\chi^2(1) = 7.09, p = .008$). Those diagnosed with ODD (alone or with other diagnosis) were significantly more likely to have onset of behavior problem 7 years old or younger compared to other diagnoses. There was a marginally significant relationship between ODD diagnosis and earlier onset of delinquency/ criminal activity ($M = 11.63, SD = 2.93$) compared to those with other diagnosis ($M = 13.75, SD = 1.66$); $t(18) = 2.08, p = .052$. There was a significant relationship between ODD and earlier onset of substance use ($M = 13.09, SD = 1.14$) compared to those with other diagnosis ($M = 14.29, SD = 1.21$); $t(26) = 2.63; p = .014$.

Table 2. *Onset of behavior problem and diagnosis.*

Count		Onset of behavior problem		Total
		7 years old or younger	8 years old or older	
Diagnosis	ODD	13 (86.7%)	2 (13.3%)	15
	Other diagnosis	10 (45.5%)	12 (54.5%)	22
Total		23	14	37

Chi(df) = 7.09(1), p = .008.

Table 3 depicts five child behavior-temperament factors that were most commonly present before the age of 10 based on the answers of participants. The most common behavior-temperament factors for this group was being restless, hyperactive, lacking concentration, refusing to follow instructions and often being angry. All of those who had all of the five most common behavior-temperament factors listed (total of 13 children) had a diagnosis of ODD, ADHD or both. A chi-square test of independence was performed to examine the relation between the five most common factors and having ODD diagnosis or not. The relation between the variables was significant, $\chi^2 (1) = 5.44$, p = .007. These behavior-temperament factors were not significantly related to earlier onset of behavior problems, $\chi^2 (1) = 1.08$, p = .298.

Table 3. *Five most common behavior-temperament factors present before the age of 10.*

The child...	Count (N)	Percentage (%)
Was restless	27	62.8%
Was hyperactive	26	60.5%
Lacked concentration	26	60.5%
Refused to follow instructions	23	53.5%
Was often angry	21	48.8%

Note. This was a multiple answer question and participants (N=43) could mark more than one choice.

Table 4 depicts answers for what treatment had been used and mean score for perceived usefulness. The most used treatment (used by 65.0% children of participants) was

psychological interviews and had the mean rate of 3.08 (neither useful nor un-useful). Next was medication with a little higher mean rate. Most treatments had the mean rate around or below 3 (neither useful nor un-useful). Treatment homes got the highest score of perceived usefulness, or 3.33, but were still on average perceived less than rather useful (4).

Table 4. *Number and proportion of answers from participants about treatment used and evaluation on the usefulness of the treatment.*

Treatment	Count (N)	Percentage (%)	Mean rate of usefulness (On the scale of 1-5)
Treatment homes	11	27.5%	3.33
Medication	25	62.5%	3.21
Psychological interviews	26	65.0%	3.08
Stuðlar*	15	37.5%	3.07
Multisystemic therapy	12	30.0%	2.8
Aggression replacement training	6	15.0%	2.57
Behavior modification at home *	21	52.5%	2.42
BUGL*	16	40.0%	2.41
Behavior modification in school	17	42.5%	2.39
Other treatment	6	15.0%	-

Note. This was a multiple answer question and participants (N=40) could mark more than one choice of treatment.

*BUGL= Children and adolescent psychiatric ward.

Stuðlar = Treatment and security program for at-risk youth undertaken by welfare agencies.

Behavior modification= A token economy system was used to modify behavior, where desirable behavior was systematically reinforced.

Independent-measures t-test revealed a non-significant difference in mean scores of perceived usefulness of implemented treatments based on ODD diagnosis ($t(26)=0.08$, $p = .934$).

However, there was a significant difference in the number of implemented treatments for children with ODD diagnosis ($M=7.09$, $SD=2.62$) and those who did not have ODD diagnosis ($M = 5.29$, $SD = 1.72$); $t(26)=2.19$, $p = .037$, indicating that children with ODD diagnosis had been exposed to significantly higher number of treatments than children with other diagnosis. Figure 1 depicts number of implemented treatments based on having ODD diagnosis or other diagnosis for all children of participants who both answered questions

regarding implemented treatments and diagnosis. Of those six children who had used 9 treatments or more five had ODD diagnosis.

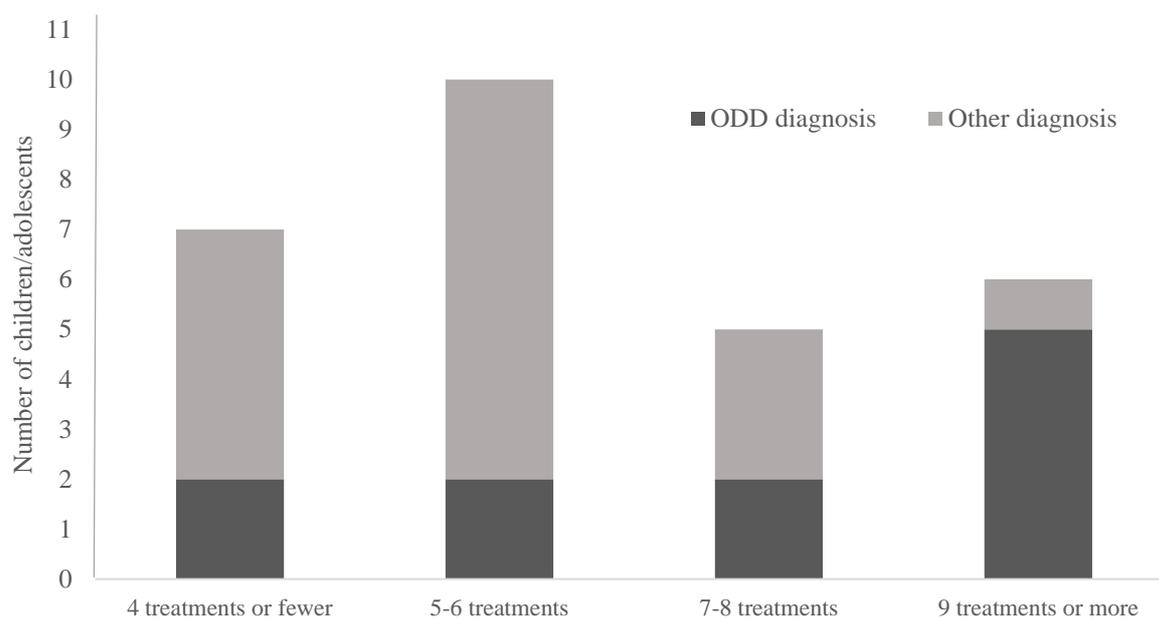


Figure 1. Number of implemented treatments based on diagnosis.

Discussion

Many studies have demonstrated association between behavior problems in early childhood and later behavior problems, substance use and delinquency. Individuals that show such behavior are more likely to have diagnosis of disruptive disorders. In this sample of at-risk youth, the prevalence of ODD and ADHD was comparable to what has been seen prior in samples of justice involved youth (Robertson et al, 2004; Shufelt & Coccozza, 2006). One of the questions guiding this study was whether or not ODD diagnosis was related to earlier onset of behavior problems, substance use and delinquent behavior. Findings showed that ODD diagnosis was significantly associated with behavior problems before the age of 8 as well as earlier onset of substance use compared to other diagnosis. There was also a marginally significant relationship between ODD diagnosis and earlier onset of delinquency / criminal activity. These results indicate children with ODD diagnosis are at greater risk of having more serious and persistent behavior problem throughout life (Farrington et al., 1990;

Loeber & Farrington, 2000). ADHD was the most prevalent diagnosis but was not significantly related to earlier onset of behavior problems, which is in line with other studies showing ODD to be a stronger predictor of later disruptive behavior (Costello et al., 2003; Lahey, Loeber, Burke, Rathouz, & McBurnett, 2002; Lahey et al., 2000; Loeber, Green, Lahey, Frick, & McBurnett, 2000).

The second question guiding this study was whether children with earlier onset of behavior problem are more likely to show certain set of behavioral-temperament factors than those with later onset of behavioral problems. Findings showed that the five most common behavioral-temperament factors listed to be present before the age of 10 were not significantly associated with earlier onset of behavior problems. However, these behavior-temperament factors were all related to the diagnostic criteria of ADHD or ODD. This is not surprising since the three most common factors are known and common symptoms of ADHD and the other two are symptoms of ODD (American Psychiatric Association, 2013). Children who were found to have all five behavior-temperament factors did all have diagnosis of ODD, ADHD or both. Both diagnoses of ODD and of ADHD were significantly related to these five behavior-temperament factors in children.

The third and last question posed related to the perceived usefulness of available and implemented treatment options and whether the perceived usefulness of those treatments differed for different diagnosis. The findings showed that all the treatments listed got low score on average for perceived usefulness and none of the treatments were perceived to be rather useful. The majority of treatments were perceived as neither useful nor un-useful. When the mean scores were examined based on diagnosis there was no significant difference among groups. However, the findings showed that children with ODD diagnosis had used significantly higher number of treatments than those with other diagnosis.

These findings support previous research that children with ODD diagnosis are at greater risk of serious and persistent behavior problems where they are more likely to have earlier onset of behavior problems, substance use and delinquency. In addition, the findings indicate that children with ODD are more likely to have had a greater number of treatments but their parents perceive the usefulness of these treatments to be little. Available treatments seem to have little to none effects on behavior problems for this sample, which is not consistent with studies on the effectiveness of similar treatments. However, the children and adolescence under study were a rather homogeneous group and it is possible that the parents and guardians of children that have not benefitted from treatments available are more likely to be part of the organization Olnbogabörn to get support and try to pressure the government to make changes. The answers are based on self-reports and it is possible that the treatments were more effective than participants experienced or reported. Regardless, the fact remains that the findings show that children with ODD are at greater risk of further behavior problems. Given that information it is important to target these children as early as possible and implement effective early intervention. Successful intervention for children with ODD could prevent further behavior problems and poor outcome in adulthood as well as contribute to reduced number of adolescent at-risk.

This study had several limitations, including small sample size. The study relied on self-report measures so inaccuracy in reporting and recall biases cannot be ruled out. There was no comparison group of children and adolescents not at-risk. The duration, frequency and seriousness of criminal activity were not taken into account. Therefore, the findings of this study should be interpreted with some caution.

This study also has some notable strengths. It undoubtedly gives certain indications for children who are at-risk and to the authors best knowledge this is the first study in Iceland to look at diagnoses in relations to time of onset for behavior problems. The anonymity of

participants is also a strength of the study were it increases the probability of honest answers to questions that address sensitive matters. Despite a small sample size, results were in line with previous research. The study provides foundation for future research and emphasizes the need for better treatment for children with ODD diagnoses.

In conclusion, the results indicated that an ODD diagnosis was related to earlier onset of behavior problem, substance use and delinquency. Furthermore, ODD diagnosis was related to having certain behavior-temperament factors at an early age and those diagnosed with ODD had received a higher number of treatments compared to other children/adolescence at-risk with other diagnosis. Future studies should use a comparison group and gather information about diagnosis through medical records as well as analyze other factors that have been associated with substance use and delinquency. A follow up study could give more insight into what group of children at-risk are more likely to have a poor outcome later in life. Further research is needed on children with ODD diagnosis and the usefulness of available treatments.

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