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Psychiatric disorders and behavior problems in people with intellectual disability

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Abstract

The relationship between behavior problems and psychiatric disorders in individuals with intellectual disability is still unresolved. The present study compares the prevalence and pattern of psychiatric disorders in individuals with intellectual disability who were assessed on the ABC to have moderate and severe behavior problems and a matched group of individuals without such problems. Both groups were living in community settings and had their intellectual disability varied from mild to profound degrees. The participants were screened for psychiatric disorders using four different instruments; the Reiss Screen, the Mini PAS-ADD, the DASH-II and the ADD. The group with moderate and severe behavior problems showed significantly more symptoms of psychiatric disorders than the group without such problems when items related to behavior disorders were omitted, and the majority of the participants with behavior problems had symptoms of the main psychiatric disorders. The participants with mild and moderate intellectual disability showed more symptoms of psychosis and depression than the participants with severe and profound intellectual disability. There were no direct associations between individual behavior problems and psychiatric disorders, but the group with mild/moderate intellectual disability showed a somewhat different pattern of associations than the group with severe/profound intellectual disability. Depression was associated with screaming and aggression in the participants with severe and profound intellectual disability, and with self-injury in the participants with mild and moderate intellectual disability. The finding that the majority of the participants with behavior problems showed symptoms of psychiatric disorders suggests that many behavior problems may be (unconventional) symptoms of psychiatric disorders or reflect a difficult life situation caused by a psychiatric disorders, or that a difficult life situation may contribute to both psychiatric disorders and behavior problems in individuals with intellectual disability.

Keywords: Psychiatric disorders; Mental disorders; Behavior problems; Challenging behavior; Intellectual disability; Mental retardation

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1. Introduction

People with intellectual disabilities seem to be vulnerable for developing behavior problems. Studies have reported that 7–15% of individuals with ''administrative'' intellectual disability (that is, individuals with intellectual disability who receive services from the authorities) have severe behavior problems (Emerson, 2001; Emerson et al., 2001). Severe behavior problems among people with intellectual disability are often termed ''challenging behavior'' (see Emerson, 2001), and aggression towards others, temper tantrums, screaming or shouting, and self-injury are examples of behaviors that may be challenging to relate to for family, support staff and others. Such behaviors may be excessively controlled by people in the environment and may result in social isolation and restricted opportunities for taking part in ordinary social and societal activities, and it may be very difficult to establish a dignified life situation for people with severe behavior problems.

The prevalence of 7–15% also implies that 85–93% of people with intellectual disability do not show severe behavior problems, even when their intellectual impairment is severe or profound. The presence of behavior problems must therefore indicate an additional problem to the intellectual disability, a co-morbid condition and/or a difficult life situation. Several authors have suggested that behavior problems may be indicators of psychiatric disorders in individuals with intellectual disability (e.g., Emerson, 2001; Gardner & Hunter, 2003; Moss, Emerson, Bouras, & Holland, 1997; Pyles, Muniz, Cade, & Silva, 1997) but the relationship between behavior problems and psychiatric disorders is still an under-researched area (Hemmings, Gravestock, Pickard, & Bouras, 2006), and the results of empirical studies vary. For example, Moss et al. (2000) found a higher incidence of psychiatric disorders in intellectually disabled individuals with challenging behavior than in intellectually disabled individuals without challenging behavior. Similar results were reported by Holden and Gitlesen (2003) who found a higher rate of psychiatric symptoms in individuals who had been referred to the habilitation services for problem behavior than in intellectually disabled individuals who showed no or minimal such behavior, especially related to anxiety and psychosis. Matson and Mayville (2001) assessed individuals with intellectual disability and physically aggressive behavior, and found that nearly half of the group met the criteria for a probable psychiatric disorder. Rojahn, Matson, Naglieri, and Mayville (2004) found that the presence of behavior problems increased the probability of almost all psychiatric conditions, and Laud and Matson (2006) found that individuals who exhibited manic symptoms were more likely than controls to show aggression and other problem behaviours during mealtime. Hemmings et al. (2006) report significant correlations (but without size) between a range of psychiatric symptoms and specific behavior problems, but conclude that it is unlikely that most behavior problems in individuals with intellectual disability are underpinned by psychiatric disorders. Hill and Furniss (2006) compared intellectually disabled individuals with and without autism and a high overall level of behavior problems, and found that autism was associated with more psychiatric symptoms, especially more severe forms of autism. Rojahn, Borthwick Duffy, and Jacobsen (1993) did not find significant correlations between severe forms of behavior problems (aggression, property destruction, self-injury and stereotypes) in individuals with intellectual disability and the presence of major psychiatric diagnosis in their journals. Similarly, Tsiouris, Mann, Patti, and Sturmey (2003) did not find significant differences between depressed and non-depressed individuals with regard to behavior problems such as self-injury and aggression.

The mixed empirical results mean that the relation between behavior problems and psychiatric disorders is not clear. One reason may be that the studies vary considerably in methodology,

sampling and assessment measures applied. The observed relation between behavior disorders and psychiatric disorders may be influenced by, for example, factors related to type of psychiatric disorder, type and severity of behavior problems, degree of intellectual disability, and type of living conditions, as these factors vary between studies.

The present study replicates and extends existing research on the relationship between behavior problems and psychiatric disorders among people with intellectual disability. The participants in the study were outpatients in the sense that all were living in community settings and none in residential institutions, and they had a broad range of intellectual disability varying from mild to profound degrees. The study uses multiple measures of psychopathology and includes four of the most commonly used checklists for psychiatric disorders in people with intellectual disability and a well-established measure of behavior problems. In order to obtain a sample with a high occurrence of behavior problems, the study includes participants from a group of persons who over a 2-year period were referred to a specialist team for challenging behavior, as well as individuals drawn from a representative group of people with intellectual disability living in five municipalities. It was hypothesized that participants with moderate and severe behavior problems would show more psychiatric symptoms than participants without such behavior problems, and that the pattern of psychiatric symptoms would vary with degree of intellectual disability.

2. Method

2.1. Participants

The participants were drawn from two different groups. One group consisted of 75 individuals who during 2002–2004 were referred to a specialist team providing ambulatory services for people with intellectual disability and behavior problems in the Northern Health Region in Norway (overall general population: 446 000). This service provides assessment, consultation and supervision related to people with intellectual disability and behavior disorders. The other group was recruited from five of the 44 municipalities in the central and southern part of Nordland County, with a general population of 55 216 individuals (Statistical Yearbook for Norway, 2006). In each of the five municipalities, meetings were arranged to inform members of organizations for persons with intellectual disability, their families and leading members of staff and managers of the social and health services about the study. People with moderate to profound degrees of intellectual disability generally have some kind of support or care organized and funded by the municipality. The invitation to participate in the study was mediated by representatives from the local social and health services, who contacted persons with an ''administrative'' intellectual disability (i.e., who received services from the municipality) and their families or guardians. A total of 155 individuals were contacted and 117 individuals and/or their guardians gave their consent and/or assent to participate in the study (75.5%). Two of these 117 individuals were already included in the study because they had been referred for behavior problems. Nine others were excluded for various reasons: one person did not have an intellectual disability, one person died before the data collection was started, the assessment instruments were considered inappropriate for three persons who had severe visual or auditory impairment and for four persons with advanced stages of dementia. The second group thus consisted of 106 persons, making a total group of 181 persons.

The Aberrant Behavior Checklist, ABC (Aman & Singh, 1986, 1994) was used to assess behavior problems (see Section 2.3 below) and allocate the participants to either a behavior

problem group or a comparison group. Of the 181 participants, ninety-eight were rated as showing at least one moderate or severe behavior problem, while for 83 participants none of the items on the ABC were rated as a moderate or severe problem. Participants in the group with moderate and severe behavior problems were matched individually with individuals in the group who had no items rated as a moderate or severe problem, according to level of intellectual disability—and as far as possible in accordance with gender and age, in that order of priority. The matching resulted in a group of 71 people rated as having at least one moderate or severe behavior problem and a comparison group of 71 people who did not have such a problem (but who might have behavior problems that were considered minor problems).

Table 1 shows the characteristics of the participants. In both groups there were four individuals with mild intellectual disability, 22 with moderate, 33 with severe and 12 with profound

Table 1
Group characteristics

	Group with behavior problems (*N*-71)	Comparison group (*N*-71)	
Level of intellectual disability			
Mild	4 (5.6%)	4 (5.6%)	
Moderate	22 (31.0%)	22 (31.0%)	
Severe	33 (46.5%)	33 (46.5%)	
Profound	12 (16.9%)	12 (16.9%)	
Gender			
Female	30 (42.3%)	36 (50.7%)	0.400[a]
Male	41 (57.7%)	35 (49.3%)	0.400[a]
Age (years)			
Mean	40.5	40.9	0.173[b]
S.D.	12.6	13.6	
Range	14–70	16–72	
Accommodation			
Staffed accommodation alone	56 (78.9%)	48 (67.6%)	0.184[a]
Staffed accommodation with another person	9 (12.7%)	13 (18.3%)	0.487[a]
Living with family	1 (1.4%)	9 (12.7%)	0.017[a,*]
Other accommodation	5 (7.0%)	1 (1.4%)	0.209[a]
Have lived in institutions	31 (43.7%)	26 (38.6%)	0.494[a]
Years in institutions			
Mean	17.9	19.7	0.655[b]
S.D.	11.1	10.3	
Range	2–44	1–44	
Average scores on the subscales of the Aberrant Behavior Checklist (S.D.)			
I. Irritability (15 items)	12.0 (9.7)	1.4 (2.1)	8.967[b,**]
II. Lethargy (16 items)	7.8 (6.9)	1.2 (1.9)	7.789[b,**]
III. Stereotypy (7 items)	2.6 (3.9)	0.6 (1.1)	4.148[b,**]
IV. Hyperactivity (16 items)	10.4 (9.2)	1.1 (2.0)	8.300[b,**]
V. Inappropriate Speech (4 items)	2.9 (3.0)	0.7 (1.1)	5.621[b,**]
Total score on the ABC (58 items)	35.6 (24.4)	4.9 (5.4)	10.350[b,**]

[a] Fisher Exact Test.
[b] Independent samples *t*-test.
[*] $p < 0.05$.
[**] $p < 0.01$.

intellectual disability (see Section 2.3 for assessment). There were 30 women and 41 men in the group with behavior problems, and 36 women and 35 men in the comparison group. The average age was about 40 years in both groups. In the group with behavior problems, 65 persons were living in staffed accommodation; 56 alone and 9 with another person. One person was living with the family at the time of the study and five persons were temporarily living in other settings. In the comparison group, 61 persons were living in staffed accommodation; 48 alone and 13 with another person. Nine persons were living with the family and one person was living in another setting. The difference in number of people living with the family was significant (Fisher Exact Test, $p = 0.017$). Prior to deinstitutionalization, 31 of the participants with behavior problems had lived in large institutions for an average of 17.9 years, while 26 participants in the comparison group had lived in large institutions prior to deinstitutionalization for an average of 19.7 years. The difference between the two groups related to length of stay in institutions was not significant.

Table 1 also shows the two groups' scores on the ABC. The participants' scores on this checklist were used to allocate them to either the behavior problem group or the comparison group, and both the groups' total scores and their scores on each subscale of the ABC differed significantly. The average total scores were 35.6 and 4.9, respectively. For all the participants in the behavior problem group at least one item on the ABC was rated as a moderate or severe problem, and most had more than one such item. Seventy individuals (98.6%) had at least one item rated as a moderate problem and 41 individuals (57.7%) had at least one item rated as a severe problem. In this group, the average number of items rated as a moderate problem was 7.0 while the average number of severe problems was 3.9. The comparison group did not have any items rated as a moderate or severe problem, but an average of 4.9 items was rated as a minor problem.

''Temper tantrums/outburst'' was the most frequent problem behavior and this item was rated as a moderate or severe problem for 30 individuals (42.3%). ''Aggressive toward other children or adults (verbally or physically)'' and ''Mood changes quickly'' were both rated as a moderate or severe problem for 27 participants (38.0%). ''Has temper outbursts or tantrums when s/he does not get own way'' and ''repetitive speech'' were both regarded as a moderate or severe problem for 24 individuals (33.8%).

In both groups, the intellectual disabilities were related to a wide range of etiologies and the pattern was somewhat different in the groups. The group with behavior problems had significantly more participants with unknown etiology than the comparison group (66.2 and 47.9%, Fisher Exact Test: $p = 0.042$) while the comparison group had significantly more participants with Down syndrome (12.7 and 40.8%, Fisher Exact Test: $p = 0.000$). Seven participants (9.9%) in the group with behavior problems and two participants (2.8%) in the comparison group had a diagnosis of autism. This difference was not significant (Fisher Exact Test: $p = 0.166$).

2.2. Ethical issues related to participation

The Regional Committee for Medical Research Ethics approved the study and the Data Inspectorate granted a license for the use of health information. Due to their intellectual disabilities, it was difficult to obtain a truly informed consent from most of the participants. For this reason, assent to participation also was obtained from close relatives or guardians. In addition, the Directorate for Health and Social Affairs gave the assistant staff and care staff exception from professional secrecy and allowed them to give the information that was requested.

2.3. Instruments

The Aberrant Behavior Checklist, ABC (Aman & Singh, 1986, 1994) was used to assess behavior problems. The ABC is a rating scale with 58 items for assessing behavior problems in children and adults with intellectual disability. The items are summed up in five subscales: (I) irritability (15 items), (II) lethargy (16 items), (III) stereotypy (7 items), (IV) hyperactivity (16 items), and (V) inappropriate speech (4 items). Each item is rated on a four-point scale as (0) no problem, (1) slight problem, (2) moderate problem or (3) severe problem. The psychometric properties of the checklist have been found to be acceptable (Aman, 2001).

Four checklists for psychiatric disorders were used: The Reiss Screen (Reiss, 1988), the Mini PAS-ADD (Prosser, Moss, Costello, Simpson, & Patel, 1997), the DASH-II (Matson, Gardner, Coe, & Sovner, 1991) and the ADD (Matson & Bamburg, 1998). These checklists are the most commonly used instruments for assessing psychiatric disorders in people with intellectual disability, in both research and clinical practice. Norwegian versions of the checklists were used in the study, and the four checklists were translated into Norwegian by the first author and then translated back to English by an independent translator. The psychometric properties of the Norwegian versions of the checklists have been found to be generally acceptable (Myrbakk & von Tetzchner, in press).

The Reiss Screen for Maladaptive Behavior (Reiss, 1988) is a screening instrument for use by care staff for identifying possible psychiatric disorders among adults who should be referred for further assessment. It consists of 38 items which are rated on a three-point scale: (1) no problem, (2) problem or (3) major problem. The identification of psychiatric disorders is based on (a) the total scores, (b) the scores on each of the eight subscales, and (c) the scores on six special maladaptive behavior items. The eight subscales are (1) aggressive behavior, (2) autism, (3) psychosis, (4) paranoia, (5) depression (behavioral signs), (6) depression (physical signs), (7) dependent personality disorder, and (8) avoidant personality disorder.

The Mini Psychiatric Assessment Schedule for Adults with Developmental Disability, *Mini PAS-ADD* (Prosser et al., 1997) is based on ICD-10 (World Health Organization, 1992) and is designed to provide care staff with a structured framework for observing possible psychiatric symptoms and making informed referrals to psychiatric services. It consists of 86 items that are assessed on a four-point scale: (0) symptoms not present, (1) mild symptoms, (2) moderate symptoms or (3) severe symptoms. The scores are summed up in six symptom scales: (1) depression, (2) anxiety, (3) hypomania/mania, (4) obsessive/compulsive disorder, (5) psychosis, (6) unspecified disorder, and three scales for developmental disorders.

The Assessment of Dual Diagnosis, *ADD* (Matson & Bamburg, 1998) and *The Diagnostic Assessment of the Severely Handicapped, DASH-II* (Matson et al., 1991) are complementary scales. The ADD is designed for people with mild and moderate intellectual disability and the DASH-II for people with severe and profound intellectual disability. The 84 items of the DASH-II are derived from the DSM-III-R classification system and the 79 items of the ADD are derived from the DSM-IV (American Psychiatric Association, 1994) and published studies involving individuals with mild and moderate intellectual disability. Both have 13 subscales. Primary carers rate the frequency, the duration and the severity of the symptoms on a three-point scale. The frequency is rated as (0) no occurrence at all, (1) has occurred between 1 and 10 times the last 2 weeks, or (2) has occurred more than 10 times the last 2 weeks. The duration is rated as (0) less than 1 month, (1) 1–12 months, or (2) over 12 months. The severity is rated as (0) caused no disruption or damages, (1) caused no damages, but interrupted activities of others at least once, or (2) caused injury or property damage at least once. The subscales on the ADD are (1) mania, (2)

depression, (3) anxiety, (4) post-traumatic stress disorder (PTSD), (5) substance abuse, (6) somatoform disorders, (7) dementia, (8) conduct disorder, (9) pervasive developmental disorder, (10) schizophrenia, (11) personality disorders, (12) eating disorders, and (13) sexual disorders. The subscales on the DASH-II are (1) impulse, (2) organic, (3) anxiety, (4) mood, (5) mania, (6) PDD/autism, (7) schizophrenia, (8) stereotypies, (9) self-injurious behavior, (10) eliminating disorders, (11) eating disorders, (12) sleep disorders, and (13) sexual disorders.

The sum scores of the items in each checklist were used as general measures of psychopathology. However, some of the items in the checklists are related to behavior problems and were therefore left out when the general psychopathology scores were calculated. For the Reiss Screen, item 1 (aggressive), 10 (destructive), 17 (hostile), 18 (impulsive), 28 (self-injury) and 35 (tantrums) were excluded. For the DASH-II, item 1 (hits), 2 (bangs head), 13 (throws object), 20 (tantrums), 42 (destroys), 50 (yelling), 55 (verbal abuse), 56 (bites), 61 (bites self) and 84 (hits self) were excluded, and for ADD item 54 (threatens, bullies), 59 (injures others) and 77 (self-injury) were excluded. None of the items in the Mini PAS-ADD are related to such behavior problems.

Leiter International Performance Scale-Revised (Roid & Miller, 1997), Wechsler Intelligence Scale for Children-Revised-III (Wechsler, 2003b), Wechsler Adult Intelligence Scale-III (Wechsler, 2003a) and Vineland Adaptive Behavior Scales, Expanded Form (Sparrow, Balla, & Cicchetti, 1984) were used to assess level of intellectual disability and adaptive functioning. The Leiter Scale was administered individually to 77 participants, the WISC-III was used with one and the WAIS-III with two participants. Vineland was completed for all participants except one person, with members of the support staff or the persons' families as informants, and the Vineland scores were used for estimating level of intellectual disability in the participants who were not assessed with the Leiter-R or the Wechsler tests. For the participant who had not been assessed with Vineland or the other tests, the level of intellectual disability was estimated clinically.

2.4. Procedure

Members of care staff were informants for 123 participants, family were informants for five participants, and both members of family and staff were informants for 14 participants. The staff members had known the person for an average of 115 months, ranging from 3 to 356 months. The interviews with care staff generally took place in or nearby the participants' homes, while the interviews with family members generally took place in the family home. The data were collected between 2002 and 2004.

Two individuals (care staff or family) participated in the assessments with the Mini PAS-ADD, the DASH-II and the ADD. Mental health professionals with at least a bachelor degree were trained in the use of the schedules and administered the assessments. The administrator presented each item to the two informants together and asked for their ratings. When administrating the Mini PAS-ADD, the glossary that is provided with the checklist was used whenever clarification was needed. The Reiss Screen is self-administered and the two informants performed the rating separately. The ABC is also self-administered and was filled in by one informant, using the glossary provided with the ABC.

The assessment usually began with the Mini PAS-ADD, followed by the Reiss Screen and the Aberrant Behavior Checklist. After a break, the DASH-II or the ADD interview completed the sessions. Including the break, the sessions lasted for about 3 h.

The final evaluation of level of intellectual disability was generally made after the completion of all assessments. The use of the ADD and the DASH-II therefore did not follow the exact

division line between mild/moderate and severe/profound intellectual disability. Fourteen participants with moderate intellectual disability who were believed to have a severe intellectual disability were rated with the DASH-II, while 10 individuals with severe intellectual disability who were believed to have a moderate intellectual disability were rated with the ADD. The DASH-II was used with 94 participants (24 with profound, 56 with severe and 14 with moderate intellectual disability) and the ADD with 48 participants (8 with mild, 30 with moderate and 10 with severe intellectual disability).

All statistics were performed with SPSS version 13.0.

3. Results

Table 2 shows the general psychopathology scores of the two groups on the four checklists (when the items related to behavior problems have been omitted) and their scores on subscales

Table 2
The two groups' scores on general psychopathology and five diagnosis-specific subscales (independent samples *t*-test with unequal variances)

	Group with behavior problems			Comparison group			*t*
	N	*X*	S.D.	*N*	*X*	S.D.	
General Psychopathology							
Reiss Screen	70	10.8	7.3	71	1.8	2.1	9.886**
Mini PAS-ADD	70	17.9	11.1	71	4.9	4.5	8.931**
DASH-II	38[a]	24.4	15.2	48	11.9	6.1	4.755**
ADD	28[a]	24.2	14.9	20	7.4	8.7	4.899**
Psychosis							
Reiss Screen	70	1.9	1.9	71	0.2	0.3	7.471**
Mini PAS-ADD	70	0.5	1.3	67	0.1	0.4	2.803**
DASH-II	40[a]	1.2	1.5	48	0.5	1.0	2.447*
ADD	28[a]	3.5	3.2	20	0.7	1.0	4.313**
Depression							
Reiss Screen Depression (B)	71	1.8	1.8	71	0.3	0.7	6.606**
Reiss Screen Depression (P)	71	2.1	1.7	71	0.4	0.7	7.647**
Mini PAS-ADD	71	5.8	5.3	71	0.9	1.5	7.522**
DASH-II	43[a]	5.7	3.7	51	2.7	2.3	4.617**
ADD	28[a]	3.4	2.9	20	1.2	2.0	3.139**
Anxiety							
Mini PAS-ADD	71	3.9	4.2	71	0.4	1.0	6.805**
DASH-II	43[a]	1.6	2.0	51	0.4	0.9	3.392**
ADD	28[a]	5.6	3.5	20	1.7	3.1	4.187**
Mania							
Mini PAS-ADD	71	2.8	3.0	71	0.4	0.8	6.725**
DASH-II	42[a]	4.0	3.0	51	1.4	1.6	5.159**
ADD	28[a]	1.9	1.7	20	0.5	0.8	3.916**
OCD							
Mini PAS-ADD	71	1.4	1.8	71	0.5	1.1	3.667**

* $p < 0.05$.
** $p < 0.01$.
[a] Note that the participants were assessed with either the DASH-II or the ADD.

representing major psychiatric disorders; including psychosis, depression, anxiety, mania and obsessive-compulsive disorder (OCD). The group with behavior problems scored significantly higher than the comparison group on both the general psychopathology measures and the diagnosis-specific symptom scales of all the checklists.

All the checklists with the exception of the ADD are provided with cut-off scores. A score above a cut-off indicates that the person displays symptoms that indicate a psychiatric disorder. The Reiss Screen has cut-offs for both general psychopathology (26-item total) and for each of the diagnosis-specific subscales, while the Mini PAS-ADD and the DASH-II are provided with cut-offs for diagnosis-specific symptom scales only. Significantly more participants in the group with behavior problems than in the comparison group scored above the cut-off on the Reiss scale for general psychopathology and on most of the diagnosis-specific symptom subscales (Table 3). The exceptions are the psychosis scale of the DASH-II and the mania scale and the OCD scale of the Mini PAS-ADD, where the differences did not reach statistical significance. The percentage of individuals who scored above the cut-offs for specific psychiatric disorders varied between the checklists, from 26.9% on the Reiss Screen and 29.6% on the Mini PAS-ADD to 44.7% on the DASH-II, and a total of 49 persons (69.0%) in the group with behavior problems and 21 persons (29.6%) in the comparison group scored above the cut-offs on one or more of these scales (Fisher Exact Test, $p = 0.000$).

Within each of the two groups, with and without behavior problems, the participants with mild and moderate intellectual disability were compared with the participants with severe and

Table 3
Number of participants in the group with behavior problems and in the comparison group who scored above cut-offs

	N	Group with behavior problems	*N*	Comparison group	Fisher
General psychopathology					
Reiss Screen	70	40 (56.3%)	71	0	0.000**
Psychosis					
Reiss Screen	70	6 (8.5%)	71	0	0.013*
Mini PAS-ADD	70	12 (16.9%)	67	2 (2.8%)	0.009**
DASH-II	40[a]	8 (18.6%)	48	3 (5.9%)	0.102
Depression					
Reiss Screen Depression (B)	71	6 (8.5%)	71	0	0.028*
Reiss Screen Depression (P)	71	11 (15.5)	71	0	0.001**
Mini PAS-ADD	71	14 (19.7)	71	0	0.000**
DASH-II	43[a]	20 (46.5%)	51	4 (7.8%)	0.001**
Anxiety					
Mini PAS-ADD	71	15 (21.1%)	71	0	0.000**
DASH-II	43[a]	14 (32.6%)	51	7 (13.7%)	0.046*
Mania					
Mini PAS-ADD	71	3 (4.2%)	71	0	0.245
DASH-II	42[a]	16 (37.2%)	51	4 (7.8%)	0.001**
OCD					
Mini PAS-ADD	71[a]	12 (16.9%)	71	5 (7.0%)	0.119

[a] Note that there are no cut-off scores for the 28 participants who were assessed with the ADD.
* $p < 0.05$.
** $p < 0.01$.

Table 4
Scores of participants with mild/moderate and severe/profound intellectual disability, and with and without behavior disorders, on general psychopathology and diagnosis-specific subscales (independent samples *t*-test with unequal variances)

	Group with behavior problems			Comparison group			Total group		
	Mild/moderate, mean (S.D.) (N = 24–26)[a]	Severe/profound, mean (S.D.) (N = 44–45)	t	Mild/moderate, mean (S.D.) (N = 25–26)	Severe/profound, mean (S.D.) (N = 41–45)	t	Mild/moderate, mean (S.D.) (N = 49–52)	Severe/profound, mean (S.D.) (N = 85–90)	t
General psychopathology									
Reiss Screen	12.3 (8.0)	9.9 (6.8)	1.301	2.0 (2.6)	1.7 (1.8)	0.375	7.2 (7.9)	5.8 (6.4)	1.066
Mini PAS-ADD	19.3 (13.8)	17.2 (9.4)	0.693	3.7 (4.1)	5.6 (4.7)	1.684	11.4 (12.7)	11.6 (9.5)	0.094
Psychosis									
Reiss Screen	2.8 (2.5)	1.3 (1.2)	2.758**	0.2 (0.4)	0.1 (0.3)	0.342	1.5 (2.2)	0.7 (1.0)	2.275*
Mini PAS-ADD	1.1 (1.8)	0.2 (0.7)	2.289*	0.2 (0.6)	0.0 (0.2)	1.475	0.6 (1.4)	0.1 (0.5)	2.489*
Depression									
Reiss Screen									
Depression (B)	2.5 (2.3)	1.4 (1.3)	2.260*	0.4 (0.9)	0.2 (0.6)	0.995	1.5 (2.0)	0.8 (1.2)	2.128*
Depression (P)	2.2 (1.7)	2.1 (1.8)	0.364	0.6 (0.8)	0.3 (0.6)	1.668	1.4 (2.0)	1.2 (1.5)	0.843
Mini PAS-ADD	7.7 (6.4)	4.7 (4.4)	2.177*	0.8 (1.5)	0.8 (1.5)	0.156	4.3 (5.6)	2.8 (3.6)	1.685
Anxiety									
Mini PAS-ADD	4.2 (4.2)	3.8 (4.3)	0.438	0.4 (1.0)	0.4 (1.0)	0.252	2.3 (3.6)	2.1 (3.5)	0.317
Mania									
Mini PAS-ADD	3.0 (3.0)	2.7 (3.0)	0.447	0.2 (0.4)	0.5 (0.9)	1.946	1.6 (2.6)	1.6 (2.4)	0.032
OCD									
Mini PAS-ADD	1.7 (2.2)	1.2 (1.5)	0.906	0.5 (1.2)	0.5 (1.1)	0.028	1.1 (1.9)	0.9 (1.4)	0.768

[a] Number of participants vary slightly due to missing data.
* $p < .05$.
** $p < 0.01$.

profound intellectual disability. Because most of the participants rated with the ADD had a mild or moderate intellectual disability and the majority rated with the DASH-II had severe or profound intellectual disability, only the scores on the Reiss Screen and the Mini PAS-ADD could be used for comparing the subgroups with different degrees of intellectual disability. Table 4 shows the general psychopathology scores and the scores on the diagnosis-specific subscales of individuals with mild/moderate and severe/profound intellectual disability in the group with behavior problems and the comparison group. The participants with mild/moderate intellectual disability in the group with behavior problems scored significantly higher on the psychosis scales of the Reiss Screen and the Mini PAS-ADD than the subgroup with severe/profound intellectual disability, and more participants in the mild/moderate subgroup scored above the cut-off on the psychosis scales (Table 5). In the group with behavior problems, the participants with mild/moderate intellectual disability also had significantly higher scores on the depression scale (B) of the Reiss Screen and on the depression scale of the Mini PAS-ADD than the participants with severe/profound intellectual disability, and there were significantly more individuals who scored above the cut-off on the depression (B) scale of the Reiss Screen. For the depression (P) scale of the Reiss Screen, there was no significant difference between the subgroups. In the comparison sample, symptom scores were generally low and the differences between the groups with mild/moderate and severe/profound intellectual disability did not reach statistical significance. The differences within the total group generally mirror the results of the group with behavior problems.

Table 6 shows the correlations between the participants' scores on psychiatric symptom scales and their total scores on the ABC and their scores on items on the ABC related to self-injury, screaming, temper tantrums and aggression. The ABC has three items related to self-injury

Table 5
Number of participants in the subgroups with mild/moderate and severe/profound intellectual disability who score above the cut-off on the Reiss Screen and the Mini PAS-ADD

	Group with behavior problems			Comparison group		
	Mild/ moderate, *N* (%)	Severe/ profound, *N* (%)	Fisher	Mild/ moderate, *N* (%)	Severe/ profound, *N* (%)	Fisher
Psychosis						
Reiss Screen	6 (23.1)	0	0.002**	0	0	–
Mini PAS-ADD	9 (34.6)	3 (6.7)	0.006**	2 (7.7)	0	0.131
Depression						
Reiss Screen Depression (B)	5 (19.2)	1 (2.2)	0.022*	0	0	–
Reiss Screen Depression (P)	4 (15.4)	7 (15.6)	1.000	0	0	–
Mini PAS-ADD	8 (30.8)	6 (13.3)	0.120	0	0	–
Anxiety						
Mini PAS-ADD	5 (19.2)	10 (22.2)	1.000	0	0	–
Mania						
Mini PAS-ADD	1 (3.8)	2 (4.4)	1.000	0	0	–
OCD						
Mini PAS-ADD	7 (26.9)	5 (11.1)	0.108	1 (3.8)	4 (8.9)	0.646

* $p < 0.05$.
** $p < 0.01$.

Table 6
Pearson correlations between the total and behavior-specific scores on the Aberrant Behavior Checklist and scores on general psychopathology score and the diagnosis-specific scales of the four checklists

	N^a	Aggression	Tantrums	Screaming	Self-injury	ABC total
General psychopathology						
Reiss Screen	139–141	0.44**	0.54**	0.40**	0.29**	0.77**
Mini PAS-ADD	132–134	0.43**	0.55**	0.41**	0.29**	0.72**
DASH-II	85–86	0.51**	0.59**	0.57**	0.41**	0.77**
ADD	47–48	0.33**	0.45**	0.22	0.29**	0.73**
Psychosis						
Reiss Screen	139–141	0.34**	0.41**	0.34**	0.15	0.57**
Mini PAS-ADD	135–137	0.04	0.06	0.05	0.08	0.19**
DASH-II	87–88	0.11	0.25*	0.45**	0.16	0.42**
ADD	47–48	0.23	0.31*	0.19	0.09	0.56**
Depression						
Reiss Screen Depression (B)	141–142	0.25**	0.38**	0.18*	0.15	0.46**
Reiss Screen Depression (P)	140–142	0.33**	0.39**	0.26**	0.13	0.54**
Mini PAS-ADD	140–142	0.35**	0.39**	0.27**	0.19*	0.58**
DASH-II	93–94	0.42**	0.45**	0.45**	0.26*	0.60**
ADD	47–48	0.21	0.27	0.11	0.36*	0.46**
Anxiety						
Mini PAS-ADD	140–142	0.36**	0.54**	0.34**	0.18*	0.52**
DASH-II	93–94	0.29**	0.51**	0.38**	0.32**	0.44**
ADD	47–48	0.44**	0.53**	0.33*	0.38**	0.74**
Mania						
Mini PAS-ADD	140–142	0.54**	0.61**	0.48**	0.31**	0.69**
DASH-II	92–93	0.50**	0.58**	0.51**	0.28**	0.68**
ADD	47–48	0.48**	0.55**	0.42**	0.41**	0.80**
OCD						
Mini PAS-ADD	141–142	0.19*	0.29**	0.29**	0.03	0.31**

Note that the participants were assessed with either the DASH-II or the ADD.
[a] Number of individuals varies slightly due to missing data.
* $p < 0.05$.
** $p < 0.01$.

(items 2, 50 and 52), two items related to shouting and screaming (items 8 and 41), two items related to temper tantrums (items 10 and 57) and one item related to aggressiveness (item 4). All the correlations between scores on the psychiatric symptom scales and the total score of the ABC were significant and most were above 0.50. The highest correlations were with general psychopathology and the mania scales, the lowest with the psychosis scale (0.19) and the OCD scale (0.31) of the Mini PAS-ADD. The items related to aggression, tantrums, screaming and self-injury also had the highest correlations with mania and general psychopathology, with some of the correlations above 0.50. Tantrums had moderately high significant correlations with most psychiatric symptom scales, and all the correlations between anxiety and tantrums and between mania and tantrums were above 0.50. None of the correlations between psychosis and specific behavior problems and between depression and specific behavior problems were over 0.50.

Self-injury generally had low correlations with most of the psychiatric symptoms subscales (Table 6) but correlated significantly with scores on the depression subscale (0.40) and the mania subscale (0.54) for participants with mild/moderate intellectual disability (Table 7). As noted, the

Table 7
Pearson correlations between the total and behavior-specific scores on the Aberrant Behavior Checklist and scores on general psychopathology score and the diagnosis-specific scales of the Reiss Screen and the Mini PAS-ADD for participants with mild/moderate and severe/profound intellectual disabilities

		N[a]	Aggression	Tantrums	Screaming	Self-injury	ABC total
General psychopathology							
Reiss Screen	Mild/moderate ID	51–52	0.35*	0.52**	0.28*	0.35*	0.72**
	Severe/profound ID	88–89	0.51**	0.56**	0.51**	0.25*	0.83**
Mini PAS-ADD	Mild/moderate ID	48–49	0.34*	0.54**	0.37*	0.35*	0.74**
	Severe/profound ID	84–85	0.50**	0.57**	0.47**	0.25*	0.72**
Psychosis							
Reiss Screen	Mild/moderate ID	51–52	0.30*	0.33*	0.37**	0.10	0.56**
	Severe/profound ID	88–89	0.50**	0.60**	0.48**	0.21*	0.73**
Mini PAS-ADD	Mild/moderate ID	51–52	−0.01	0.03	0.21	0.06	0.27
	Severe/profound ID	84–85	0.17	0.12	−0.01	0.13	0.15
Depression							
Reiss Screen	Mild/moderate ID	51–52	0.18	0.39**	0.23	0.40**	0.64**
Depression (B)	Severe/profound ID	89–90	0.37**	0.43**	0.23*	−0.08	0.36**
Reiss Screen	Mild/moderate ID	51–52	0.26	0.40**	−0.10	0.14	0.32*
Depression (P)	Severe/profound ID	89–90	0.38**	0.38**	0.41**	0.13	0.67**
Mini PAS-ADD	Mild/moderate ID	51–52	0.33*	0.49**	0.31*	0.40**	0.70**
	Severe/profound ID	89–90	0.41**	0.33**	0.32**	0.01	0.54**
Anxiety							
Mini PAS-ADD	Mild/moderate ID	51–52	0.40**	0.64**	0.23	0.17	0.54**
	Severe/profound ID	89–90	0.35**	0.49**	0.40**	0.18	0.51**
Mania							
Mini PAS-ADD	Mild/moderate ID	51–52	0.48**	0.63**	0.39**	0.54**	0.78**
	Severe/profound ID	89–90	0.58**	0.60**	0.53**	0.17	0.64**
OCD							
Mini PAS-ADD	Mild/moderate ID	51–52	0.13	0.06	0.31*	0.00	0.32*
	Severe/profound ID	89–90	0.25*	0.25*	0.29**	0.04	0.31**

[a] Number of individuals varies slightly due to missing data.
* $p < 0.05$.
** $p < 0.01$.

ADD was primarily used for participants with mild/moderate intellectual disability and a comparable pattern of correlations between self-injury and depression and between self-injury and mania was found on this checklist. Participants with severe/profound intellectual disability had significant correlations between aggression and depression (from 0.37 to 0.41), between aggression and mania (0.58), between screaming and depression (from 0.23 to 0.41) and between screaming and mania (0.53), while the correlation between self-injury and depression and between self-injury and mania did not reach statistical significance. The DASH-II, used for participants with severe/profound intellectual disability, showed comparable patterns of correlations between behavior problems and scores on the scales for depression and mania (Table 6).

Correlations between individual behavior problems and psychiatric disorders varied considerably for the four checklists. For example, there were significant correlations between the psychosis subscale of the Reiss Screen and aggression, tantrums and screaming, whereas

none of these behavior problems correlated significantly with the psychosis subscale of the Mini PAS-ADD. Screaming showed the highest correlation with the psychosis subscale of the DASH-II, whereas temper tantrums was the only specific behavior problem that was significantly correlated with the psychosis scale of the ADD.

4. Discussion

The results of the present study demonstrate a strong relationship between behavior problems and psychiatric symptoms. Sixty-nine percent of the group with behavior problems scored above the cut-off on one or several of the psychopathology subscales, compared to 29% of the comparison group. The results support the findings of several other studies suggesting a strong relation between behavior problems and psychiatric disorders in individuals with intellectual disability (cf., Hemmings et al., 2006; Holden & Gitlesen, 2003; Linaker, 1994; Moss et al., 2000; Rojahn et al., 2004; Walshe et al., 1993). The behavior problems may reflect underlying psychopathology or a difficult life situation related to the presence of a psychiatric condition, or a difficult life situation may contribute to both psychiatric disorders and behavior problems in individuals with intellectual disability. Matson and Mayville (2001) found that aggression in individuals with intellectual disabilities were significantly related to both psychopathology and environmental conditions.

Generally, more symptoms of psychiatric disorders were found among participants with mild and moderate than among participants with severe and profound intellectual disability. Participants with mild and moderate intellectual disability were more likely to show symptoms of psychosis and depression than participants with severe and profound intellectual disability, while scores on the other diagnosis-specific subscales were more evenly distributed among the participants with different levels of intellectual disability. Similar findings are reported by Holden and Gitlesen (2004), who reported higher scores on all the subscales of the Mini PAS-ADD for participants with moderate than for participants with severe and profound intellectual disability. These findings contrast with those of Cooper and Bailey (2001) and Cooper, Smiley, Morrison, Williamson and Allen (2007) who found the highest rates of psychiatric disorders among the participants with more severe intellectual disability. However, unlike the present study, the studies by Cooper and Bailey (2001) and Cooper, Smiley, Morrison, Williamson, and Allan (2007) included behavior problems among the psychiatric disorders and this may at least partly explain the differences between the studies, as 18.8% of the participants with severe/profound intellectual disability had a diagnosis of behavior disorders in the 2001 study and 28.5% of the individuals with moderate to profound intellectual disability had a diagnosis of problem behaviors in the 2007 study.

Recently researchers have investigated possible associations between certain psychiatric diagnoses and specific behavior problems (e.g., Hemmings et al., 2006; Rojahn et al., 2004; Tsiouris et al., 2003). In the present study, anxiety was strongly correlated with tantrums, and mania was strongly correlated with both tantrums, aggression and screaming. Self-injury showed the weakest correlations with both general psychopathology and the diagnosis-specific subscales, especially psychosis. None of the correlations between self-injury and the psychosis subscales reached significance, indicating that self-injury is not a usual feature of psychotic states.

The pattern of correlations between psychiatric disorders and specific behavior problems, however, differed somewhat between individuals with mild/moderate and severe/profound intellectual disability. Depression seemed to be associated with aggression, tantrums and screaming in the group with severe/profound intellectual disability and with tantrums and

self-injury in the group with mild/moderate intellectual disability. The results of former studies on the associations between psychiatric diagnoses and behavior problems have varied and it is possible that the distribution of intellectual disability in the samples may explain some of this variation. In a sample with predominately profound intellectual disability, Rojahn et al. (2004) found weak and non-significant correlations between depression and self-injury while Hemmings et al. (2006) found significant correlations between self-injury and a range of symptoms that are usually associated with depression in their investigation of people with predominately mild and moderate intellectual disability. When level of intellectual disability is taken into consideration, the results in the study by Rojahn et al. (2004) and the study by Hemmings et al. (2006) are comparable to the present study.

The differences in cognitive abilities may explain why depression is associated with different problem behaviors among people with mild/moderate and among people with severe/profound intellectual disabilities. It is possible that individuals with mild and moderate intellectual disability reflect more on their life situation and more often react with despair and self-directed behaviors like self-injury when they are depressed, while people with severe/profound intellectual disability more often react with other-directed behavior. However, in the present study, depression was not the only psychiatric disorder that was associated with self-injury among the participants with mild/moderate intellectual disability; the correlations between mania and self-injury on the Mini PAS-ADD and the ADD and between anxiety and self-injury on the ADD were at the same level or higher than the correlation between depression and self-injury. These broad associations with self-injury may be related to the fact that individuals with mild and moderate intellectual disability often have low self-esteem (Jahoda, Dagnan, Jarvie, & Kerr, 2006; McGillivray, & Marita, McCabe, 2007; Szivos-Bach, 1993) and therefore may tend to react with self-directed negative behavior when experiencing difficult situations. Behavior problems may be caused by somewhat different underlying processes in people with different degrees of intellectual disability and it may be necessary to distinguish between individuals with different degrees of intellectual disability when investigating the relationship between behavior problems and psychiatric disorders.

All the diagnosis-specific subscales correlated significantly with the overall score on the ABC and the pattern of correlations compares well with the results found by Paclawskyj, Matson, Bamburg, and Baglio (1997) in their comparison of the ABC and the DASH-II. The correlations between individual behavior problems and diagnosis-specific subscales, however, varied somewhat between checklists and when comparing the Reiss Screen, the Mini PAS-ADD, the DASH-II and the ADD, Myrbakk and von Tetzchner (in press) found considerable differences in the checklists' identification of individuals who need referral for psychiatric assessment. This means that the choice of checklist for identifying psychiatric symptoms may influence the conclusions of a study but the basis for the differences awaits further study. At present it is not clear whether the different patterns reflect true differences in the prevalence of psychiatric disorders or are caused by the way the instruments identify symptoms of different psychiatric disorders.

The strengths of the present study include the use of multiple measures of psychiatric disorders administered by trained clinicians and the use of standardized intelligence tests and standardized scales for assessment of adaptive behavior. One weakness is the fixed order of administering the assessment instruments as possible order effects cannot be completely ruled out. The number of participants in the study is also somewhat low and the results should therefore be interpreted with appropriate caution.

The development of functional treatments for behavior problems in people with intellectual disabilities must be based on a proper understanding of the nature of these problems. The present

study demonstrates a significant association between behavior disorders and psychiatric problems and implies that treatment of psychiatric disorders may be a significant element in the management of behavior problems in individuals with intellectual disability who show behavior problems.

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