Journal of Developmental and Physical Disabilities, Vol. 13, No. 4, December 2001 (© 2001)

Assessment of Schizophrenia in Persons With Severe and Profound Mental Retardation Using the Diagnostic Assessment for the Severely Handicapped-II (DASH-II)

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The identification and diagnosis of schizophrenia in persons with severe and profound mental retardation has been a controversial issue. Although it has been established that schizophrenia occurs in this clinical population, persons with odd behaviors characteristic of mental retardation or severe behavior disturbances are often diagnosed with schizophrenia and treated with traditional or atypical antipsychotic medications. The present study assessed schizophrenia in a sample of persons with severe and profound mental retardation using the Diagnositic Assessment for the Severly Handicapped-II (DASH-II), a rating scale which contains purely behavioral criteria that are essential features of various DSM-IV *disorders. Three groups of participants were compared; (a) those with an independent psychiatric diagnosis of schizophrenia and a significant elevation on the schizophrenia subscale of the DASH-II; (b) those with a significant elevation on this subscale, but no formal diagnosis of schizophrenia; and (c) controls without any elevation of the DASH-II subscales. Results indicated that the three groups were empirically distinguished across the frequency, duration, and severity dimensions of the DASH-II schizophrenia subscale. Item analyses demonstrated that individuals with a diagnosis of schizophrenia and an elevation of the subscale had higher scores on items containing verbal symptoms of the disorder. Implications of these findings are discussed with respect to the diagnosis of schizophrenia in persons with severe and profound mental retardation, with particular emphasis on the efficacy of the DASH-II for assessing the disorder.*

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1056-263X/01/1200-0319$19.50/0

KEY WORDS: assessment schizophrenia; mental retardation; severely handicapped.

INTRODUCTION

It is generally agreed that persons with mental retardation exhibit the same types of psychopathologic disorders as adults of normal intelligence (Matson and Barrett, 1993; Menolascino, 1988). Prevalence estimates vary (Borthwick-Duffy, 1994), but the rate of psychopathology in persons with mental retardation is estimated at four to five times higher than in those of normal intelligence (Rutter *et al.*, 1976; Singh *et al.*, 1991). The widespread prevalence of psychopathology and emotional problems in persons with mental retardation is not surprising, given their central nervous system deficits and limited coping skills (Eaton and Menolascino, 1982). Nonetheless, psychiatric disorders in this population are an important concern for mental health professionals who recognize that the availability and adequacy of therapeutic and support services for persons with mental retardation is poor (Jacobson and Ackerman, 1988). Because these persons may already function at levels of minimal independence, the onset of mental health problems often leads to more restrictive placement (Reiss, 1993). Understanding the nature of psychiatric disorders in adults with mental retardation is an important first step in addressing their service needs and developing effective treatment programs along the continuum of services.

In recent years, the growing awareness of psychopathology in persons with mental retardation has resulted in increased attention directed toward issues such as prevalence, classification, assessment, and diagnosis of specific disorder types (Szymanski, 1988). Accurate identification of psychiatric disorders in persons with mental retardation is essential for establishing the prevalence of comorbid disorder types, as well as for providing appropriate support services and individual treatment plans. Despite its importance, the diagnosis of psychopathology in persons with mental retardation remains a challenge for several reasons (Sovner, 1986). For example, diagnostic overshadowing (i.e., where abnormal behaviors are assumed to be the result of mental retardation rather than potential comorbid psychopathology) often obscures identification of psychiatric conditions in this population (Crews *et al.*, 1994; Reiss *et al.*, 1982). Further, the behavioral criteria for psychiatric disorders in adults of normal intelligence are not necessarily applicable to persons with mental retardation. Although standard clinical nosological frameworks may be adapted for use in persons with mild to moderate mental retardation, one could question the application of these criteria for persons with severe and profound mental retardation (Sovner, 1986). It is widely recognized that the diagnosis of specific disorder types becomes

progressively more difficult as the level of mental retardation increases. Thus, examination of specific disorder types by level of mental retardation is imperative for evolving a more complete understanding of the clinical features and characteristics of psychiatric disorders in persons of varying levels of intellectual impairment (Cherry *et al.*, 1997; Iverson and Fox, 1989; Jacobson, 1990).

Historically, dual diagnosis of schizophrenia and mental retardation has been a source of controversy and debate in the clinical literature (Turner, 1989). Prevalence estimates of schizophrenia in persons with mental retardation have varied from 2 to 14% (Bregman, 1991; Wright, 1982). Although this range seems wide, it is generally accepted that the reported prevalence rates for schizophrenia in the population of persons with mental retardation generally exceed the prevalence estimates reported for those of normal intelligence, which have ranged from 0.6 to 3% (Singh and Katz, 1989).

There is a small, but growing literature on the characteristics of schizophrenia in persons with mild to moderate mental retardation (Reid, 1989). Recent studies have shown that the symptoms and clinical features of schizophrenia in persons with mild and moderate mental retardation are similar to those in persons of normal intelligence (Doody *et al.*, 1998; Linaker and Helle, 1994). One might, therefore, assume that persons with severe and profound mental retardation would also be susceptible to the onset and development of schizophrenia, as the assumption is that psychiatric conditions should be evident across the continuum from mild to profound mental retardation. Thus, persons with severe and profound mental retardation might be expected to exhibit behavioral signs and symptoms of schizophrenia, However, formal diagnoses of schizophrenia may not be forthcoming because of the deficits in communication skills and limited verbal capabilities of these persons (Borthwick-Duffy and Eyman, 1990). The development of empirically-derived behavioral criteria that are less dependent upon language ability is one avenue that may provide a basis for the diagnosis of schizophrenia in persons with severe and profound mental retardation.

In the present research, we addressed assessment issues in schizophrenia for persons with severe and profound mental retardation. Our aim was to provide new evidence on the efficacy of the Diagnostic Assessment for the Severely Handicapped (DASH-II) as a screening tool for schizophrenia. The DASH-II is an informant-based measure that assesses a wide range of psychiatric disorders and emotional problems in persons with severe and profound mental retardation along three behavioral dimensions (frequency, duration, and severity). In this study, we included three comparison groups of persons with severe and profound mental retardation; (a) those with an

independent psychiatric diagnosis of schizophrenia and a significant elevation on the schizophrenia subscale of the DASH-II, (b) those with a significant elevation on the DASH-II schizophrenia subscale, and (c) those without elevation on any of the DASH-II subscales, which we included for control purposes. We expected that the two groups with a significant elevation on the schizophrenia subscale would show similar patterns of frequency, duration, and severity of symptoms, overall, relative to the control group. Item analyses were also expected to reveal both similarities and differences between the two groups with a significant elevation on the schizophrenia subscale, which may provide insight into why a psychiatric diagnosis of schizophrenia was warranted for those in the first, but not the second group. For example, it may be that the two groups are rated similarly on the subscale items that involve the motoric features of schizophrenia (e.g., stands or sits in bizarre positions). At the same time, it may also be that those in the first group (with the independent psychiatric diagnosis) are rated higher on the items that require overt verbalization (e.g., talks with imaginary people or inanimate objects) than those in the second group (less the psychiatric diagnosis). Such a pattern of outcomes would provide important new information on the sensitivity of the DASH-II as a screening tool for detecting the presence of schizophrenia in persons with severe and profound mental retardation.

METHOD

Participants

Participants in the study were drawn from a large developmental center ($n = 757$) in central Louisiana. All were classified as having severe (82%) or profound (18%) mental retardation based on the *DSM-IV* (APA, 1994). Group 1 ($n = 20$) contained persons with a psychiatric diagnosis of schizophrenia and an elevation on the schizophrenia subscale of the DASH-II ($M = 47.7$ years). These individuals had no other psychiatric diagnoses besides schizophrenia. Group 2 ($n = 20$) contained persons with an elevated schizophrenia score on the DASH-II who did not warrant a psychiatric diagnosis of schizophrenia ($M = 43.7$ years). Group 3 ($n = 20$) served as an experimental control and consisted of persons with no significant elevations on any of the DASH-II subscales and they did not warrant a psychiatric diagnosis of any sort ($M = 45.1$ years). Participants were selected so that the composition of the groups would be similar with respect to age, gender, race, and level of mental retardation. Demographic and health characteristics of the sample appear in Table I.

Table I. Demographic and Health Characteristics by Group

Variable	Group 1	Group 2	Group 3
Gender			
Male	55%	55%	55%
Female	45%	45%	45%
Race			
White	80%	80%	80%
African American	20%	20%	20%
Level of mental retardation			
Severe	90%	65%	90%
Profound	10%	35%	10%
Verbal			
Yes	90%	80%	85%
No	10%	20%	15%
Severe health problems			
Yes	18.6%	22.3%	20.7%
No	81.4%	77.7%	79.3%
Presence of physical disability			
Yes (at least one)	63.2%	70.4%	67.9%
Yes (at least two)	38.9%	44.1%	41.7%
No	36.8%	29.6%	32.1%
Type of physical disability			
Visual impairment	5%	0	5%
Hearing impairment	0	10%	25%
Seizure disorder	35%	40%	40%
Wheelchair/bed	5%	15%	10%
Coma/semiconscious	0	0	0
Other	15%	15%	5%
None of the above	40%	20%	15%
Medical cause of mental retardation			
Down syndrome	0	5%	10%
Other genetic	5%	5%	5%
Damage from infection	10%	15%	10%
Injury/head trauma	20%	20%	5%
Oxygen insufficiency	25%	10%	20%
Other	10%	15%	20%
None of the above	30%	30%	30%

Note: Group 1 consists of those with a significant elevation on the DASH-II Schizophrenia subscale and an independent psychiatric diagnosis of Schizophrenia. Group 2 consists of those with only a significant elevation on the DASH-II Schizophrenia subscale. Group 3 is a control group with no psychiatric diagnoses or elevations on the DASH-II

Measures

Diagnostic Assessment for the Severely Handicapped II (DASH-II): The DASH-II (Hamilton, 1995; Matson *et al.*, 1991) consists of 84 behavioral symptoms derived from the DSM classification system and past studies of dual diagnosis. There are 13 subscales for screening purposes: (1) Anxiety,

(2) Depression, (3) Mania, (4) PDD/Autism, (5) Schizophrenia, (6) Stereotypies, (7) Self-Injury, (8) Elimination, (9) Eating, (10) Sleep, (11) Sexual, (12) Organic, and (13) Impulse Control. Each item on the DASH-II is scored as a 0, 1, or 2 for frequency, duration, and severity of behavioral symptom. Psychometric studies with the DASH-II have included measures of internal and external reliability (Sevin *et al.*, 1995) and factor analysis (Matson *et al.*, 1991). Interrater reliability and test-retest reliability were good for the dimensions of frequency (*r*'s of .86 and .84, respectively), duration (*r*'s of .85 and .84), and severity (*r*'s of .95 and .91). Also, DASH-II subscales have been validated for a number of subscales including the stereotypes and self-injury subscale (Matson *et al.*, 1997a), the Autism/PDD subscale (Matson *et al.*, 1997c), the mania subscale (Matson and Smiroldo, 1997), and the anxiety disorders subscale (Matson, 1997b).

Procedure

Health-care specialists interviewed direct care staff using the DASH-II. The specialists had master's degrees in psychology, had extensive training on using the DASH-II, and were supervised by a licensed psychologist. Interviews were conducted as part of a comprehensive psychological evaluation to assist in the development of appropriate behavior treatment plans for each subject. If the respondent rater became confused about questions during the interview, clarification consisting of providing term or time-limit definitions. Cutoff scores of one standard deviation above the mean within the frequency dimension, based on norms developed with a sample of 1,245 subjects, were used to determine group makeup for the two schizophrenia comparison groups (Hamilton, 1995). According to these norms, a cutoff score of 3 or above on the schizophrenia subscale of the DASH-II constituted a significant elevation (one standard deviation above the mean) and warranted further assessment.

DSM-IV Diagnoses

The following protocol was employed to arrive at the schizophrenia diagnosis. Information from the DASH-II, other behavioral rating scales, social skills measures, and behavioral observations were presented to a licensed psychologist so that the diagnosis could be considered. After reviewing the information provided and the criteria for schizophrenia provided by the *DSM-IV* (APA, 1994), the licensed psychologist made a decision as to whether the diagnosis was warranted. If it was felt that the person in

question met *DSM-IV* criteria for the diagnosis of schizophrenia, the information was presented to a board certified psychiatrist for review. If the psychiatrist of record felt that enough information was presented to warrant the diagnosis, the diagnosis was given and became the diagnosis of record.

RESULTS

We conducted a multivariate analysis of variance (MANOVA) with group as the independent variable and the frequency, duration, and severity scores for the DASH-II schizophrenia subscale as the dependent measures. Means appear in Table II. This analysis (Wilks criterion) yielded a significant group effect, $F(6, 110) = 22.71$; $p < .001$. Univariate analyses of variance (ANOVAs) indicated that the groups significantly differed on the frequency, $F(2, 57) = 73.41$; $MSe = 1.52$; $p < .001$; duration, $F(2, 57) = 25.80$; $MSe = 0.39$; $p < .001$; and severity, $F(2, 57) = 29.35$; $MSe = 0.31$; $p < .001$ dimensions. Pairwise comparisons (t tests) confirmed that the mean frequency and severity ratings for Group 1 (those with a diagnosis of schizophrenia and an elevation on the schizophrenia subscale) were significantly higher than those of Group 2 (elevation on the schizophrenia subscale only; p's $< .001$). Although the mean duration rating for Group 1 was larger than that of Group 2, this difference was nonsignificant ($p = 0.22$). As expected, the mean frequency, duration, and severity scores for Groups 1 and 2 were all significantly greater than those of Group 3 (control group; p's $< .001$). Thus,

Table II. Mean Frequency, Duration, and Severity Ratings on the Schizophrenia Subscale by Group

Group	Frequency	Duration	Severity
Group 1			
M	5.11	1.89	1.83
SD	1.55	0.31	0.41
Group 2			
M	3.09	1.76	1.23
SD	1.33	0.44	0.44
Group 3			
M	0.38	0.60	0.44
SD	0.60	0.94	0.76

Note. Group 1 consists of those with a significant elevation on the DASH-II Schizophrenia subscale and an independent psychiatric diagnosis of Schizophrenia. Group 2 consists of those with only a significant elevation on the DASH-II Schizophrenia subscale. Group 3 is a control group with no psychiatric diagnoses or elevations on the DASH-II.

our three comparison groups were reasonably well-distinguished across the frequency, duration, and severity dimensions of the DASH-II schizophrenia subscale.

To provide a finer-grained analysis of the similarities and differences among the three groups, we conducted item analyses to examine the frequency of endorsements on the seven DASH-II schizophrenia subscale items. As can be seen in Table III, Group 1 contained larger endorsements across the frequency, duration, and severity dimensions than did Groups 2 and 3 for five of the seven subscale items (i.e., Items 10, 60, 64, 66, 68). Importantly, most of these items were those containing verbal behavior. In contrast, the items that were most frequently endorsed for Groups 2 and 3 pertained to patterns of unrelated moods (Item 7) and standing/sitting in bizarre positions (Item 65). This aspect of the data is interesting, insofar as these symptoms are often found in persons with developmental disabilities, independent of psychiatric diagnosis. Taken as a whole, our findings show that although nonverbal individuals may receive elevations based on

Table III. Mean Frequency of Endorsement for Schizophrenia Subscale Items

	Frequency	Duration	Severity
Mood seems totally unrelated to what is going on around (Item 7)			
Group 1	0.75	1.18	0.25
Group 2	1.17	1.59	0.35
Group 3	0.24	0.31	0.05
Talks with imaginary people or inanimate objects (Item 10)			
Group 1	1.63	1.75	0.31
Group 2	0.24	0.28	0.14
Group 3	0.03	0.03	0.03
Speech is a jumble of words or ideas that make no sense (Item 60)			
Group 1	1.19	1.19	0.19
Group 2	0.31	0.35	0.07
Group 3	0.03	0.04	0.01
Hears things that are imaginary (Item 64)			
Group 1	1.13	1.31	0.25
Group 2	0.00	0.00	0.00
Group 3	0.01	0.00	0.00
Stands or sits in bizarre positions (Item 65)			
Group 1	0.44	0.50	0.06
Group 2	1.14	1.35	0.28
Group 3	0.08	0.09	0.02
Experiences touch or other sensations on skin that are imaginary (Item 66)			
Group 1	0.31	0.44	0.13
Group 2	0.00	0.00	0.00
Group 3	0.01	0.02	0.00
Sees things that are imaginary (Item 68)			
Group 1	1.13	1.38	0.19
Group 2	0.14	0.21	0.03
Group 3	0.02	0.04	0.00

inappropriate mood or posture, only those capable of communicative speech are likely to be diagnosable for schizophrenia.

We conducted a follow-up analysis to determine whether those in Group 2 (with an elevation on the schizophrenia subscale only) had been diagnosed with any of the other disorder types measured by the DASH-II. We were especially interested in determining whether there was an association between an elevated schizophrenia subscale score and the prevalence of other disorder types. Evidence of such an association would provide useful new information on the sensitivity of the DASH-II as a screening tool for psychopathology in the population of persons with severe and profound mental retardation. Other disorder types for those in Group 2 are listed in Table IV. We do not report "other diagnosis" for those in Group 1, because they had no diagnoses other than schizophrenia, and Group 3 was a no-diagnosis control group.

As can be seen in Table IV, the majority of those in Group 2 were diagnosed with either Stereotypic Movement Disorder ($n = 8$) and Psychotic Disorder NOS ($n = 6$). The schizophrenia subscale of the DASH-II appears to be detecting overlapping symptoms across various *DSM-IV* disorders. For example, odd motoric behaviors present without other symptoms of schizophrenia suggest the presence of movement disorders. Further, psychotic features endorsed that do not meet the full clinical picture of schizophrenia suggests the presence of Psychotic Disorder NOS. This finding is noteworthy, as elevations on the schizophrenia subscale, even in the absence of schizophrenia, appear to indicate the need for further assessment of psychopathology in persons in this population. Also, this finding lends validity to the utility of the DASH-II as a screening instrument, as 17 of the 20 persons in this group displayed symptoms severe enough to warrant a psychiatric diagnosis. The symptoms on the schizophrenia subscale, when endorsed to a significant elevation, appear accurate in indicating the presence of some type of psychopathology.

Table IV. Prevalence of Other Disorder Types in Group 2 ($n = 20$)

Diagnosis	*n*	%
Stereotypic Movement Disorder	8	40
Psychotic Disorder NOS[a]	6	30
Bipolar disorder	2	10
Anxiety Disorder NOS	1	5
No diagnosis	3	15

[a]Not otherwise specified.

DISCUSSION

We investigated the characteristics of schizophrenia in persons with severe and profound mental retardation. Two major findings emerged from the analyses. First, dually-diagnosed individuals with an elevation on the DASH-II schizophrenia scale were differentiated from the other two study groups (i.e., individuals with only an elevation on the schizophrenia scale and individuals with mental retardation in the absence of a dual-diagnosis or scale elevation) in the endorsement of items related to verbal behavior (e.g., "talks with imaginary people or inanimate objects"). Second, the DASH-II appears to be sensitive to symptoms that are consistent with psychotic disorders. These findings are discussed hereunder.

Dually-diagnosed individuals with severe and profound mental retardation were differentiated from the other two clinical groups in terms of the presence, frequency, and severity of verbal symptoms on the DASH-II. These findings have implications for the debate regarding the ability to diagnose schizophrenia in persons with severe and profound mental retardation (Bregman, 1991; Sovner, 1986). In particular, our results suggest that a diagnosis of schizophrenia in this population is viable, although perhaps only among those who can articulate their symptoms or for symptoms that lend themselves to verbal confirmation or both (Reid, 1989).

Consistent with prior research on persons with mild to moderate mental retardation and schizophrenia (Doody *et al.*, 1998; Reid, 1989), dually-diagnosed individuals with severe and profound mental retardation exhibit a range of positive verbal symptoms, in particular hallucinations, delusions, and disorganized speech (Table II). In this respect, the positive features of schizophrenia for individuals with severe and profound mental retardation, at least in terms of frequency, resemble the clinical picture of schizophrenia without mental retardation (Johnstone and Frith, 1996). However, negative symptoms were markedly underrepresented in this group. It is possible that diagnostic overshadowing influences identification of negative symptoms, such as flat affect and withdrawal; the presence of mental retardation decreases the significance of anomalous behaviors associated with psychopathology (Reiss *et al.*, 1982). Therefore, it is possible that the frequency of negative symptoms among persons with severe and profound mental retardation in this study is an underestimate.

The primary goal of this study was to shed light on the sensitivity of the DASH-II as a screening tool for schizophrenia in persons with severe and profound mental retardation. Our examination of the pattern of diagnoses in the sample of individuals with an elevation on the schizophrenia scale of the DASH-II, but without a diagnosis of schizophrenia, indicated that most of these individuals (i.e., 80%) met criteria for psychiatric disorders that

shared either clinical features with schizophrenia (i.e., Psychotic Disorder NOS) or psychomotor features consistent with the neuroleptic side-effects often seen among persons with schizophrenia (i.e., Stereotypic Movement Disorder). Thus, the DASH-II appears to be adequate for identifying behaviors and symptoms that are consistent with schizophrenia, and therefore, is a reasonable screening tool for this disorder. However, the DASH-II's relative lack of specificity for schizophrenia suggests that it should not be the sole instrument used for diagnosis. Rather, the DASH-II should be used in conjunction with other assessment instruments for diagnosing schizophrenia in persons with severe and profound mental retardation.

Much of the emphasis on the diagnosing of schizophrenia in persons with mental retardation, as in the area of schizophrenia in general, is in developing methods to improve upon our ability to diagnose this disorder. However, schizophrenia is associated with great clinical heterogeneity, leading some to argue that the diagnosis itself should be abandoned and that we should concentrate on specific symptoms (e.g., hallucinations) rather than general syndromes (Bentall *et al.*, 1988). If one adopts this approach, then the DASH-II may have excellent clinical utility for identifying specific *symptoms* to be targeted for treatment. This approach may be especially important given evidence that clinical response to psychopharmacologic interventions among persons with mental retardation are not dependent on psychiatric diagnosis (Bregman, 1991). Thus, for persons with severe and profound mental retardation, the emphasis on diagnosis may have to be shifted to a focus on symptoms.

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