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ORIGINAL PAPER

Diagnosis and Treatment of Mood Disorders in Adults with Developmental Disabilities

Diana J. Antonacci · Nadir Attiah

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Abstract While the idea that individuals with developmental disabilities (DD) can suffer from mental illness has been largely accepted since the late 1980's, this is still an underserved and poorly studied population. In particular, mood disorders have traditionally been misdiagnosed, under-recognized and poorly treated. Through the years, reported rates of mood disorders in adults with DD have varied widely. Recent epidemiological studies have focused on community samples and find rates of mood disorders from 3 to 8.1%. Mood disorders are found to be more prevalent than psychotic disorders or anxiety disorders. The empirical literature on assessment of mood symptoms in adults with DD is limited, particularly in individuals with severe and profound DD. Several tools have been developed to assist in identification and diagnosis. However, the work on their psychometric properties and validity studies is still quite limited. The treatment literature is sparse and focused primarily on pharmacotherapy. This review considers the epidemiology and diagnosis of mood disorders in individuals with DD. Recent developments in assessment are reviewed. The literature regarding pharmacological treatment with antidepressants, mood stabilizers, electroconvulsive therapy and antipsychotics is summarized and the current state of psychological treatments for mood disorders in persons with DD is presented. Implications for clinical care and future research are considered.

Keywords Mood disorders · Depression · Intellectual disability · Developmental disability · Mental illness · Pharmacotherapy · Behavioral therapy · Psychological treatment

Introduction

Mood disorders are common in the general population. In their 2007 review of national surveys from the Australian, German, Dutch and US-American epidemiological literature,

D. J. Antonacci (✉) · N. Attiah
Department of Psychiatric Medicine, The Brody School of Medicine at East Carolina University, 905 John's Hopkin's Drive, Greenville, NC 27834, USA
e-mail: antonaccid@ecu.edu

Baumeister et al. [1] found that mood disorders (Major Depression, Dysthymia, Bipolar Disorder), were the most frequent psychiatric disorders identified in population mental health studies (6.6–11.9%). Major Depression was the most common mood disorder (6.3–10.3%) and in 85% of episodes was rated as at least moderate in severity, negatively impacting the individual's day to day life. Dysthymic Disorder and Bipolar Disorder were reported as somewhat less frequent, but still significant, with rates of 1.1–2.5% and 0.8–2.6% respectively.

In the past, clinicians were less inclined to label people with developmental disabilities (DD) with another clinical diagnosis, even if they displayed overt symptoms of psychopathology. While the idea that individuals with DD can suffer from mental illness has been largely accepted since the late 1980's, this is still an underserved and poorly studied population [2, 3]. In particular, mood disorders have traditionally been misdiagnosed, under-recognized and poorly treated [4, 5]. Through the years, reported rates of mood disorders in adults with DD have varied widely with a range from 7 to 97% [6–8]. There are a number of methodological problems which account for this wide range. These include small sample size, lack of uniformity in screening and assessment instruments, broad and highly variable inclusion criteria, and a focus on higher functioning, more verbal subgroups. Much of the epidemiology of mental health problems in the DD population is still unknown although improved methodology and additional information are emerging [9]. In the last 10 years, researchers have attempted to look at community based samples in a more rigorous way.

Epidemiology

Tsakanikos et al. [10] studied 137 adults with Autistic Disorder who were accepted for referral to a community assessment service in the UK between the years 1983 and 2001. The authors looked at subjects in 3 time bands in order to examine diagnostic trends. During the assessment period, 2 long stay institutions in the area closed, one in 1988 and another in 1994. Psychiatric diagnoses were made by a psychiatrist as part of delivering a clinical service using interviews with key informants and the patient. Two psychiatrists further agreed on the diagnosis by using the clinical criteria of ICD-10. The majority of individuals who were assessed had no psychiatric disorder (62.7%). In the group who were given a psychiatric diagnosis, schizophrenia spectrum (16.1%) and depressive disorders (6.6%) were the most common ICD-10 categories assigned.

Bouras et al. [11] reported on the same study population using the same methodology, but included all 752 referred individuals, the majority of whom were white males between the ages of 18 and 44. 63.3% had mild DD and 22.5% had moderate disabilities. No psychiatric diagnosis was made in 46.8% of individuals. Of those with a diagnosis on Axis I, 17.6% were in the schizophrenia spectrum and 8.1% in the mood disorder category, with these 2 groups again representing the two most common diagnostic categories. The authors conclude that schizophrenia spectrum disorders are the most common psychiatric disorders in people with DD, supporting findings of previous researchers. They further comment that the finding of depressive disorders being the second most common diagnosis is somewhat contrary to what older studies have found, perhaps reflecting a trend of increasing identification of depressive disorders in people with DD.

In a retrospective chart review of patients referred to an academic teaching hospital for diagnostic evaluation, Hurley et al. [12] analyzed 300 records and divided them into 3 groups: 100 individuals with mild DD; 100 individuals with moderate, severe or

profound DD and 100 matching adult referrals without DD. Presenting problems and chief complaints varied among the 3 groups, with mood complaints, anxiety complaints and suicidality being much more common in the non-DD group as compared to either DD group. When the mild group was compared to the moderate/profound group, anxiety and suicidality were more common. Mood disorders (depressive and bipolar) were the most frequent diagnoses in the non-DD group (66 cases), followed by personality disorders (24 cases) and anxiety disorders (19 cases). The mild-DD group was very similar, with 62 individuals having mood disorders, 14 with ADHD/impulse control disorders, 11 with personality disorders and 10 with anxiety disorders. The most common diagnoses in the severe and profound DD group were mood disorders (64 cases) followed by cognitive disorders (11 cases) and ADHD/impulse control disorders (8 cases). The authors comment that this is the first published study to recognize depressive disorders in high numbers in persons with DD and they emphasize that there were very few psychotic diagnoses made.

An interesting finding in this study was that as cognitive disability increased, the proportion of bipolar diagnoses relative to depressive diagnoses increased. In the mild DD group, 20 individuals had a bipolar disorder diagnosis while 42 had depressive disorders as a diagnosis. In the severe/profound DD group the ratio was 39 bipolar to 25 depressive disorders. The authors explain this finding by noting that 93% of persons with DD were accompanied to the appointment by caregivers. This was in contrast to 9% of those without DD. They speculate that bipolar disorder is more easily recognized than depression in individuals with DD because manic symptoms are more outwardly observable than depressive symptoms. Additionally, depressive disorders are characterized by internalizing symptoms less easily appreciated in individuals with severe and profound disabilities and limited language skills. Because of the common assertion that aggression is a "depressive equivalent" in individuals with severe and profound DD, the authors analyzed the relationship between aggression as a chief complaint and subsequent diagnosis, finding no significant relationship. They concluded that in both DD groups, the professionals making the diagnoses saw the symptom of aggression as only a small part of the larger diagnostic evaluation whereas the caregivers saw this as a key indicator of mental illness.

In 2007, Cooper et al. [13] investigated the prevalence of psychiatric disorders in 1023 individuals with DD. This population-based study used individual assessments which were comprehensive and standardized. Men and women were equally represented and level of disability ranged from mild to profound. Psychiatric diagnoses were made by a psychiatrist experienced with disabilities, review of case notes, the Vineland Scale (Survey Form) [14], and the Present Psychiatric State for Adults with Learning Disabilities (PSS-LD) [15]. This semi-structured instrument is specifically designed to be used with adults with DD and allows classification by clinical, DC-LD, ICD-10-DCR, and DSM-IV-TR criteria. Six hundred five participants (59.1%) had no clinical diagnoses, 297 (29.1%) had one, 94 (9.2%) had two, 25 (2.4%) had three and 2 (0.2%) had four. Affective disorders had a point prevalence of 6.6% with the majority (4.1%) being a unipolar depressive episode. There was a 4.4% point prevalence in the psychotic disorder category, the majority of which (2.9%) were in a schizophrenic episode. In the anxiety category (3.8% point prevalence), generalized anxiety disorder (1.7%) was the most widely recognized diagnosis. In this study, associated factors were measured. For the entire cohort, factors which were independently associated with mental illness of any type (excluding autistic spectrum disorders and specific phobias) were: severe DD, higher numbers of life events in the preceding 12 months, smoking, living with paid caregivers, lack of physical disability, unimpaired

mobility, having urinary incontinence and being female. The authors note that somewhat lower prevalence rates were found using ICD-10-DCR and DSM-IV-TR, supporting the contention made by previous researchers [16, 17] that these diagnostic classification systems do not take into account the effect of developmental level on psychopathology and, therefore, do not accurately represent the presentation of psychiatric disorders in individuals with DD. While this was particularly true with the category of "problem behavior", it was seen across all diagnostic categories except for alcohol and substance abuse disorders.

Diagnosis

There are acknowledged barriers to recognition and diagnosis of mood disorders in persons with DD [6]. Communication deficits are frequent, especially in individuals with more severe DD. These deficits preclude the use of many standard diagnostic instruments/interviews and can make it difficult to understand if aberrant behavior is due to a mental illness, brain injury or environmental circumstances. The interaction between symptoms and developmental level is complex. Symptoms and developmental level can mutually influence each other and this may not be well understood by examiners with limited exposure to persons with DD. For example, minor emotional issues can be magnified by a developmental disability and the presence of a psychiatric disorder can suppress scores on intelligence tests or adaptive screens. Referral for psychiatric consultation is often dependent on caregivers recognizing signs and symptoms of a mood disorder. Internalizing symptoms such as feelings of depression or subjective distress may be difficult for a person with DD to understand or report and may be unappreciated by an outside observer. Caregivers and clinicians inexperienced with developmental disabilities may have limited ability to distinguish psychiatric symptoms from problems in adaptive behavior. This can lead to a phenomenon known as "diagnostic overshadowing", [18] the tendency to attribute behavioral problems to a developmental disability rather than a psychiatric disorder. Thus, even when a referral for mental health services is made, a specific and accurate diagnosis may be difficult to establish. While there are acknowledged barriers to identification and accurate diagnosis of mental health problems, several tools have been developed to assist. Work on their psychometric properties and validity studies is still quite limited but will be reviewed below.

In the early 80's, Sovner and Hurley [4] reviewed the literature and found 25 reports related to the occurrence of affective illness in persons with DD. They argued that based upon their review, a full range of affective disorder diagnoses could be made, at all levels of developmental disability. For individuals with mild to moderate DD, DSM-III criteria could be used with minor modifications. When cognitive disability was in the severe to profound range, changes in behavior and vegetative functioning as well as family history could be used to arrive at a diagnosis. Since that time, the investigation of this important area has continued and there have been 2 overarching themes in the scientific literature. One area of study is the clarification of how mood symptoms present in persons with DD, regardless of disability level. This includes discussions of the usefulness and feasibility of looking at syndromes versus symptom clusters. The second is to understand if individuals with DD and mood disorders present with unique symptom presentations or demonstrate core symptoms of depression similar to the general population. For example, aggression and other 'challenging behaviors", referred to as atypical symptoms, have been thought by some to be behavioral equivalents of affective disorders.

Assessment of mood symptoms in adults with DD has been studied although the empirical literature is limited, particularly in individuals with severe and profound DD. The majority of authors have concentrated on people with mild and moderate DD. In general, methods are divided into two broad categories: self-report and informant-based. Researchers have argued that individuals with mild cognitive delays have symptoms which parallel those in non-DD individuals and standardized measures can be used with only minor modifications. Kellett et al. [19] evaluated the use of the Brief Symptom Inventory (BSI), a 53 item self-report inventory with items scored on a five-point Likert scale ranging from 'not at all' to 'extremely' in 200 individuals with mild cognitive delays. The study population consisted of 3 groups: people living in the community who were referred for assessment of intellectual capacity ($N = 73$, 62% male), people living in the community who were already receiving DD services who were referred due to psychological distress ($N = 82$, 60% male) and 45 men diagnosed with an intellectual disability, convicted of a crime, and detained in a maximum-security hospital. An assisted completion protocol was used following guidelines for completion of the SCL-90-R previously published by the authors [20]. The authors demonstrated reasonable internal reliability of symptom dimensions across all 3 study groups. Discriminant validity was investigated and showed a clear distinction between clinical and community groups. The authors conclude that the BSI could be utilized as an outcome measure to assess the effectiveness of clinical interventions in persons with intellectual disabilities. In 2004, the same authors [21] performed a factor analysis of the BSI with a sample of 355 individuals with mild cognitive delays and found that 8 clear and interpretable factors emerged. They concluded that people with DD respond to a large proportion of items on the BSI in a manner similar to the non-DD population.

In a 2003 study, Glenn et al. [22] examined 46 people with diagnoses of mild ($N = 30$), moderate ($N = 9$) or borderline ($N = 7$) mental retardation. The participants were recruited from a community living and work program. Seven were currently diagnosed with a depressive disorder and an additional 12 had formerly been diagnosed as depressed by psychiatrists at a local mental health center. Twelve of the participants were receiving antidepressant medication. A battery of tests was administered by reading all scale items to the participant and using four flashcards to visually prompt a scale ranging from "never" to "a lot". Tests included the Beck Anxiety Inventory [23], the Reynolds Child Depression Scale [24], the Automatic Thoughts Questionnaire [25] and the Cognitions Checklist [26]. The authors found a high correlation between anxiety and depression in the study group and between negative affect and maladaptive cognitions. Consistent with previous researchers, this group found a relationship between measures of depression and maladaptive cognitions in persons with mental retardation.

Powell [27] examined the psychometric properties of the Beck Depression Inventory (BDI) and the Zung Self Rating Depression Scale in 120 adults with mental retardation. Mean participant IQ was 53 (range 22–75). 54% lived in group homes, 24% in large state institutions, 12% in supervised apartments and 10% in their own homes or apartments. Seventy-one (59%) of participants had an Axis I disorder—33 (28%) had some form of mood disorder and 18 (20%) had psychosis or thought disorder. The items were read by the examiner and, if they were able, the participants were allowed to read the items themselves. A Likert bar graph was used to illustrate magnitude. The authors conclude that the BDI has clinical utility in this population. The factor analysis produced a structure factor consistent with other tested populations, thus suggesting validity in persons with mental retardation. Results of the Zung were equivocal with low internal consistency factors and a factor analysis did not yield reliable, interpretable loadings. The BDI and Zung correlated

with one another and the authors suggest that the Zung could be used as a screening test included in a battery of instruments. The author's BDI data further suggested that self-report of distress was minimized in the DD population and that verbalizations about failure or not wanting to attempt new things may be as related to depression as crying and tearfulness.

In 2003 Lunsky [28] performed structured interviews with 99 individuals with developmental disabilities in order to ascertain if gender plays a role in depressive symptoms in this population. Participants were adults with borderline to moderate cognitive disability who were living in the community. Approximately 40% were referred from a clinical outpatient setting where they were receiving counseling or group therapy. Men and women were equally represented in this clinically referred group. Self-report ratings included the Wechsler Abbreviated Scale of Intelligence (WASI, Psychological Corporation, 1999); Birleson Depressive Short Form Self-Rating Scale (BDS) [29], Social Support Self-Report for intellectually disabled adults (SSSR) [30], Loneliness Questionnaire (LQ) [31], Life-stress Inventory [32]; and 2 items measuring coping [33]. Informant ratings included the Reiss Screen for Maladaptive Behavior [34] and the Birleson Depression Scale—Informant Ratings. In their sample, women scored significantly higher on the BDS than men. However, men and women did differ in levels of social support, loneliness or perceived stress. Informants reported no gender differences. When the authors examined the depressed subgroup (individuals falling into the upper quartile on the BDS) they found that 50% of the women and 50% of the men with high BDS scores had attempted suicide in the past. Women in the high BDS group reported greater stress than women in the low BDS group. Men in both the high and low BDS groups reported the same levels of coping although the high BDS group reported higher levels of stress than the low BDS group. Both men and women in high BDS groups were significantly more dissatisfied with their residential situation, reported less support from family, more loneliness at home and more problems getting along with family. The authors conclude that, overall, women reported higher levels of depression than men, tended to be unemployed, have poorer social support from family and to come from abusive situations. Both men and women who were depressed were lonelier and reported higher stress levels.

Two self-report measures have been developed to target unique symptoms of depression displayed by persons with developmental disabilities. The Glasgow Depression Scale for People with a Learning Disability (GDS-LD) [35] is a 20 item Likert self-report scale with a parallel 16 item informant versions. Items were drawn from various diagnostic criteria including DC-LD, DSM-IV and ICD-10. Focus groups of individuals with mild to moderate cognitive disabilities were used to develop appropriate language for the scales. The response format for both versions incorporates a 3 point ordinal scale. The GDS-LD was then field tested using 3 groups of 20 individuals—DD/depressed; DD/not depressed and non-DD/depressed. Differences were detected between the groups despite the small sample size. The authors concluded that both scales appeared useful for screening, monitoring progress and appraising outcomes.

More recently, Marshall and Willoughby-Booth [36] explored the reliability of a modified Clinical Outcomes in Routine Evaluation—Outcome Measures (CORE-OM), using 2 different presentation styles. Subjects were 22 individuals with mild or moderate cognitive delays and mental health issues. Preliminary results were promising with the majority of modified statements understood by the participants. The modified CORE-OM was found to have an excellent test–retest correlation when a sequencing task was completed prior to presentation of a histogram scale. The authors highlight the need to conduct a larger study after further modifications of the measure.

While modifications of existing diagnostic criteria and assessment tools can be used as self-report measures in individuals with mild to moderate delays, informant-based measures of mood may be particularly relevant to the assessment of individuals with severe and profound cognitive disabilities, where self-reporting is not possible. Ross and Oliver [37] provide a review of rating scales and interview measures used either as screening tools for general psychopathology or as tools to assess the severity of episodes of depression. Two informant rating scales, the Reiss screen [34] and the Psychopathology Inventory for Mentally Retarded Adults [38] assess general psychopathology. While the Reiss screen was developed for individuals with all levels of disability, the PIMRA is designed for those with mild to moderate delays. The Reiss screen provides a symptom list which is then grouped into 8 dimensions/disorders based on a factor analysis of DSM-III diagnostic classifications. The Reiss screen has been shown to have moderate to good reliability and validity [39, 40]. While studies have included individuals with severe and profound delays, there are concerns about the validity of this screen in this more delayed group. At least 8/23 items on the Reiss screen are inaccessible for non-verbal individuals and would be rated as "no problem" or zero. The validity of items such as "low initiative" and "suicidal tendencies" is also questionable.

The Psychiatric Assessment Schedule for Adults with a Developmental Disability (PAS-ADD) [41], and the mini-PAS-ADD are checklists which assist staff and caregivers in recognizing potential mental health problems and to initiate referrals when indicated. Evidence of good validity was provided by Moss et al. [42] who compared PAS-ADD scores with scores on a referrer checklist.

One measure has been specifically designed to evaluate emotional disturbances in individuals with severe and profound disabilities, the Diagnostic Assessment for the Severely Handicapped II (DASH-II) [43]. Informants are asked to rate frequency, duration and severity of symptoms related to 13 diagnostic categories based on DSM-III-R. Criticism of this instrument includes the presence of a number of items which cannot be rated in individuals who do not communicate verbally, limited applicability in individuals with significant physical disabilities and ambiguous or poorly defined terms. Paclawskyj et al. [44] studied 233 individuals, most with severe and profound mental retardation, comparing the DASH-II with the Aberrant Behavior Checklist (ABC) [45]. The depression subscale of the DASH-II was shown to correlate with the lethargy and social withdrawal subscales of the ABC. In 1999 Matson et al. [46] compared DASH-II scores to DSM-IV diagnoses made by a psychiatrist in 57 individuals with severe or profound delays. The DASH-II was able to distinguish between depressed and non-depressed individuals although 4/15 individuals in the depressed group did not have elevated depression subscale scores.

Meins [47] piloted the Mental Retardation Depression Scale (MRDS), an informant rating scale designed to assess depression across all levels of disability. The MRDS was able to distinguish adults with DD and major depressive disorder those with DD and other depressive disorders and those with DD without depressive disorders. However, only 14/51 participants had severe or profound mental retardation and several items might be difficult to ascertain in this subgroup.

Two newer measures use observable behaviors with may be reliably measured by informants. Esbensen et al. [48] developed the Anxiety, Depression and Mood Scale (ADAMS) a 28 item informant-report behavior rating scale with 5 subscales, manic/hyperactive behavior, depressed mood, social avoidance, general anxiety and compulsive behavior. The factor structure was internally consistent, showed reasonable model fit, and displayed easily interpretable factors. Individuals with depression could be distinguished from those without depression on the depressed mood subscale. The ADAMS is brief,

behaviorally based and able to assess comorbid anxiety making it a potentially useful instrument in the severe/profound DD population. The authors note that the 28 item scale does not include self-injury or aggression as potential symptoms of depression, consistent with the view that self-injury and aggression are not behavioral equivalents for depression.

The Mood, Interest and Pleasure Questionnaire has likewise been developed as a tool for caregiver informants. This 25 item Likert scale has a 12 item mood subscale and a 13 item interest and pleasure subscale. In their preliminary analysis of the psychometric properties of the MIPQ, Ross and Oliver [49] used the MIPQ and the Aberrant Behavior Checklist to study 53 participants with severe or profound learning disabilities, who were partly or non-verbal. Of these, 23 participants (43%) were included in an examination of test–retest and inter-rater reliability of the MIPQ. The scale demonstrated acceptable internal consistency, good inter-rater reliability and high test-retest reliability. There was correlation between the MIPQ total score and the Lethargy and Social Withdrawal subscales of the Aberrant Behavior Checklist [45].

Treatment

Despite the fact that mood disorders are among the more frequent psychiatric diagnoses in individuals with DD, there is very little published research which can guide treatment. What has been published to date tends to focus on individuals with mild to moderate cognitive delays treated with only pharmacological approaches. This is in contrast to the widespread endorsement of combined approaches to the treatment of mood disorders in the non-DD population [50, 51]. Inclusion criteria for the vast majority of studies is "challenging behavior"—aggression, self-injury and disruption. Subjects may or may not have identified psychiatric disorders/diagnoses and improvement in mood symptoms is seldom included in the reported outcomes. Additionally, the studies which have been published have other significant methodological limitations such as small sample size, inadequate study design and lack of standard measures. However, as Lunsky notes in a recent review of the literature on depression in DD [52], on depression in intellectual disability, advances are being made. The literature on pharmacological treatment of mood disorders will be reviewed first.

Pharmacological Treatments

Antidepressants

In individuals with DD, antidepressants have been used for several major psychiatric illnesses, including major depression and other depressive disorders. Additionally, antidepressants, especially selective serotonin reuptake inhibitors (SSRIs), have been used to treat anxiety disorders (obsessive compulsive disorder, posttraumatic stress disorder), anxiety symptoms which do not meet full criteria for a DSM disorder and self-injurious or aggressive behavior. Expert consensus regarding the treatment of psychiatric and behavioral problems in individuals with DD [53] recommends that SSRIs be used for treatment of major depressive disorder. However, the literature supporting use of antidepressants for treatment of primary mood disorders is quite limited. This review will focus on use of antidepressants for the specific treatment of depression.

In an early case report, Sovner et al. [54] reported the use of fluoxetine 20 mg/d to treat chronic depression and associated self-injurious behavior in a woman with severe DD and a man with profound DD. Response to fluoxetine included a decrease in self-injury as well as positive changes in mood, interest and energy levels.

In a 1997 study, Masi et al. [55] treated 7 depressed adolescents with paroxetine in doses from 20 to 40 mg/d. Clinical changes were assessed using DSM-IV criteria and the Montgomery-Asberg Depression Rating Scale (MADRS) [56] at the beginning of treatment and 9 weeks later. The mean decrease on the MADRS was 41%. Four of the subjects no longer fulfilled DSM-IV criteria after 9 weeks of treatment. Side effects were transitory and not severe and there was no behavioral activation.

Verhoeven and colleagues [57] investigated the effect of citalopram in 20 individuals with DD and behavioral abnormalities suggestive of a depressive disorder. Citalopram was started at 20 mg/d and was unchanged for 6 weeks. After 6 weeks the dosage was adjusted as needed to a maximum of 60 mg/d. Treatment effects were assessed using the Clinical Global Improvement Scale (CGIS) [58] with 6 to 12 months of follow-up. Major side effects were limited to seizures in one individual and a delirium at maximum high dose in another. A moderate to marked improvement was observed in 12 patients. No response was noted in the remaining 8 patients.

In 2004 Janowsky et al. [59] reviewed the treatment response to a variety of serotonergic antidepressants in 38 institutionalized DD adults. Agents included selective serotonin reuptake inhibitors ($N = 36$) and clomipramine ($N = 2$). The individuals studied were treated for aggression, self-injurious behavior, destructive/disruptive behavior, depression/dysphoria or a combination of these or other challenging behaviors. Sixteen individuals had diagnoses of depression or bipolar disorder based on clinical evaluations and psychiatric symptoms listed in their charts. Twenty-eight were in the range of profound cognitive disability, 6 were in the severe range and four were in the moderate range. Those studied were most often placed on and SSRI or clomipramine because of an incomplete response to other psychopharmacological agents or because of a desire to eliminate drugs that were causing or had the potential to cause unacceptable side effects such as tardive dyskinesia. Fourteen received paroxetine, 9 fluvoxamine, 7 sertraline, 5 fluoxetine, 1 citalopram and 2 clomipramine. Twenty-eight of the studied individuals were receiving other psychotropic medications (typical or atypical antipsychotics, benzodiazepines, beta blockers or anticonvulsants). Data was gathered by psychologists and reviewed in quarterly multi-disciplinary treatment team meetings where frequency of the target behaviors of aggression, self-injury and disruptive/destructive behavior was evaluated. The authors retrospectively reviewed this data noting that not every individual was rated on all parameters as data collection varied among the individuals studied. Eighteen individuals had ratings for depression/dysphoria pre-and post treatment and all showed significant decreases ($p < 0.0001$). The authors note that the majority of the subjects were non-verbal as well as severely or profoundly disabled. Thus, clinical diagnoses relied heavily on observations of changes in rates of target behaviors, cyclic withdrawal, crying, whining, agitation or cyclic associated sleep disturbances.

Mood Stabilizers/Anticonvulsants

Lithium carbonate and anticonvulsant mood stabilizers have been used as therapeutic agents in the management of disruptive behavior, aggression and self-injury in individuals with DD. Experts [53] recommend the use of mood stabilizers/anticonvulsants for the

treatment of bipolar disorder in this population. Among the mood stabilizers, divalproex was considered the agent of choice by 90% of those surveyed. Similar to the case with antidepressants, the literature supporting use of mood stabilizers and anticonvulsants for treatment of bipolar affective disorders is quite limited.

Kastner et al. [60] reported the results of an open trial of valproic acid in the treatment of affective symptoms in 21 individuals with DD. Inclusion criteria were symptoms of irritability, sleep disturbance, aggressive or self-injurious behavior and behavioral cycling. Eighteen patients completed the study. Fourteen responded positively to treatment and were maintained on valproate for 2 years. A history of epilepsy or suspicion of seizures was strongly associated with a favorable response and the authors comment that the inclusion criteria of irritability, sleep disturbance, aggressive or self-injurious behavior and behavioral cycling may have been associated with subclinical seizure activity which then responded positively to treatment with anticonvulsants.

Verhoeven and Tuiner [61] report the results of a pilot study which included 28 individuals with DD in the mild to severe range. The studied individuals had a long history of episodic changes in behavior and affect. Twelve had previous diagnoses of mood disorder, 4 had atypical autism, 3 had psychotic disorder and one had panic disorder. Valproic acid was dosed to achieve serum levels with a mean plasma concentration of 63 mg L and the follow-up period lasted one year in 21 subjects and 6 months in the remaining 7. Treatment effects were assessed using the Clinical Global Improvement Scale (CGIS) [58] with a moderate to marked improvement observed in 19 individuals. The authors note that improvement was comprised of stabilization of behavior and mood, as well as a reduction of symptoms belonging to the mood, anxiety and motor domains. Minimal changes or no improvement were noted in nine individuals.

In 1999 Vanstraelen and Tyrer [62] reviewed the published literature on rapid cycling bipolar affective disorder in children and adults with DD spanning the years from 1974 to 1998. Fourteen studies or case reports were included in their analysis. Eight were descriptive studies [63–70], 2 investigated the efficacy of certain types of treatment [71, 72], 3 combined description and treatment efficacy [73–75]) and 1 examined rating scales for mood disorders [76]. Methodologies were highly variable, numbers of patients per report were small (10 was the largest N) and outcome measures, if reported at all, were non-rigorous. A variety of information was gathered from the reports, providing an $N = 40$ for their review. The authors pooled the data regarding onset of symptoms, number of episodes, regularity of cycles, symptomatology, family history, comorbid medical problems, treatment and outcome. They summarized the information regarding treatment as follows: A total of 25 patients were prescribed Lithium alone at some stage in their treatment. Four improved markedly and 5 improved partially. Thirteen showed little or no improvement. Cycling increased in one, aggression increased in another and a third had side effects necessitating discontinuation. Lithium and valproate were used in combination in one patient who was a non-responder. Ten patients were treated with lithium and carbamazepine together. Six showed no improvement and 1 improved slightly with the addition of thyroid hormone. Fifteen patients were treated with carbamazepine alone at some point in their clinical course. Three received carbamazepine primarily for a seizure disorder. Twelve of the 15 showed no improvement. One patient developed a rash and treatment was stopped. Valproate was use as monotherapy in 6 patients, one primarily for a seizure disorder. One individual completely remitted, 2 showed “marked” or “significant” improvement and 3 showed no change. One patient was treated with valproate in combination with carbamazepine and showed no change in symptoms.

Carta et al. [77] studied the efficacy of adjunctive gabapentin in the treatment of individuals with DD and bipolar spectrum disorders. Ten individuals who were in semi-residential rehabilitation centers were enrolled. All had DD ranging from mild disability ($N = 4$) or moderate ($N = 5$) to severe ($N = 1$). Six had a diagnosis of bipolar disorder and 4 had a diagnosis of schizoaffective disorder. All of the individuals were receiving other psychotropic medications as follows: risperidone ($N = 2$), haloperidol ($N = 7$), clozapine ($N = 1$), paroxetine ($N = 2$), carbamazepine ($N = 2$), phenobarbital ($N = 1$), and benzodiazepines ($N = 7$). Individuals were selected for study on the basis of a clinical history of 2 or more declines in their clinical conditions subsequent to a specific life event. The stressful life events were predictable and allowed for data collection around the time of the event (Christmas holiday, advancement of the work program, etc.). Data was initially collected during a period of observation which included the week before the critical event and 3 weeks after the event. Adjunctive therapy with gabapentin at doses from 600 to 900 mg/day was then initiated. The mean duration of adjunctive therapy before the next critical event was 4 months. When the critical event recurred, standardized assessments were repeated. The authors reported that during the treatment period, there was a loss of rehabilitation days equal to 6.6% as compared to 31.6% prior to gabapentin treatment. Using the Assessment and Information Rating Profile (AIRPA) [78] statistically significant decreases on the subscales of anxiety, depression and adjustment disorders were demonstrated after gabapentin treatment. The AIRP score for mood disorder was reduced by 77%. Additionally, several items on the behavior disorder scale showed a statistically significant reduction with treatment. These included physical aggressiveness, destructiveness, screaming or other noises, temper tantrums, verbal abuse, overactiveness, wandering, running away and attention seeking. The authors comment that no hypomania or increase in frequency of seizures was observed with gabapentin therapy. They conclude that gabapentin may have a possible role as an alternative mood stabilizer in individuals with DD and bipolar disorder.

In a brief report, Janowsky et al. [79] reviewed the treatment response to topiramate on aggressive, self-injurious and disruptive/destructive behaviors in 22 institutionalized DD adults, most of whom had a mood disorder. Fifteen individuals had a clinically assigned psychiatric diagnosis of bipolar disorder. The remaining 7 had "other" mood disorders not specified by the authors. Comorbid diagnoses in the group included autism, anxiety disorder and obsessive compulsive disorder. Topiramate was administered as an add-on therapy because of incomplete responses to other psychpharmacologic agents or to minimize or avoid drugs associated with unacceptable side effects. Sixteen of the 22 individuals had all other psychotropic agents continued as topiramate was added while 6 had other agents decreased or stopped during topiramate administration. The medications which were used in combination with topiramate included typical and atypical antipsychotics, anticonvulsants, lithium, tricyclic antidepressants and selective serotonin reuptake inhibitors. The authors retrospectively evaluated response to treatment by using reports from quarterly multidisciplinary treatment meetings. Measured cumulative target behavioral ratings were reported 3 months before, just before, 3 months after and 6 months after topiramate. When cumulative behaviors for these periods were compared, aggression decreased in 9 of 16, increased in 5 and was unchanged in 2. Self-injury decreased in 7 of 11, decreased in 3 and was unchanged in one. Disruptive behavior decreased in 6 of 8 and increased in 2. The "worst behavior score" (highest observed frequency for any target behavior) decreased in 14 of 19 and was unchanged in one. Nine individuals showed a 50% or greater decrease in "worst behavior" totals. A significant decrease in global behavioral severity rating scores was seen over time after beginning topiramate with 6 individuals showing a 50% or greater decrease in

global severity ratings. Although the subjects all had mood disorder diagnoses, the focus of these multidisciplinary treatment meetings appears to have been on target behaviors of aggression, self-injury and disruptive behavior rather than on mood symptoms or other, more typical, symptoms of an affective illness. No measures of mood, sleep, appetite, energy, etc. are reported. The authors comment that making an affective disorder diagnosis in this population of individuals (severe and profound cognitive disability) is difficult and clinicians relied upon cyclic changes in target behaviors as a marker for affective illness.

Electroconvulsive Therapy (ECT)

ECT is an effective and safe treatment for affective disorders in the non-DD population [80]. Despite this, there are no systematic studies of its effectiveness or safety in the DD population. In 2004, Kessler [81] published a review of the literature on the ECT treatment of affective disorders in persons with DD from 1968 to 2001. Sixteen cases were identified. Seven of the cases were diagnosed with major depression [82–87], 2 had bipolar disorder [88, 89] and 7 had psychotic depression [90–94]. Kessler notes that three of the cases [92] were individuals with Down Syndrome referred for suspected dementia and one case [88] described treatment of self-injurious behavior rather than bipolar disorder. Kessler then describes 4 new cases, all in individuals with mild cognitive delays. Two had bipolar disorder, one had a psychotic depression and one had schizoaffective disorder. Symptoms remitted with ECT treatment. Follow-up was prolonged (4 years to 11 years) and improvement was sustained with pharmacotherapy. Kessler notes that all 4 patients had long, chronic courses with poor response to pharmacotherapy prior to ECT. Inadequate observational data and history, overemphasis on behavioral dyscontrol and the confounding presence of prolonged PTSD symptoms clouded the diagnostic picture with these patients and most likely delayed the eventual choice of ECT treatment.

Antipsychotics

Antipsychotic medications, especially atypical antipsychotics, are used to treat bipolar mania in the non-DD population, either as primary treatment in the acute phase or as an adjunct to treatment with lithium or anticonvulsants. Mood stabilizers and atypical antipsychotics in combination therapy can often provide a more rapid onset of action and greater efficacy than can be seen with any of these agents alone. Combination therapy is also efficacious for patients with breakthrough mania or incomplete responses to lithium or anticonvulsants alone [51]. Expert Consensus Guidelines for Treatment of Psychiatric and Behavioral Problems in Individuals with Mental Retardation [53] conclude that the same medications which are used to treat specifically diagnosed psychiatric disorders in individuals without DD can be used in DD individuals with the same diagnoses. For bipolar disorders the experts recommend valproate or lithium alone or in combination with an atypical antipsychotic. The published literature regarding treatment of DD individuals with antipsychotic medications focuses primarily on aggression, self-injury, hyperactivity, repetitive behavior, and disruptive or "challenging" behavior rather than on the specific treatment of mood disorders. The literature regarding treatment of primary mood disorders with antipsychotic medications, both as adjunctive agents or monotherapy, is quite limited and is reviewed below.

Buzan and colleagues [95] reviewed the literature on the use of clozapine in adults with mental retardation and found that aggression, self-injurious behavior, psychosis and tardive

dyskinesia were the most commonly cited treatment indications. In their 1998 report, they reviewed the treatment of 10 individuals with DD who were treated with clozapine in institutional and community group homes. Indication for treatment was poor response to previous medications. Three individuals had diagnoses of schizoaffective disorder, 3 had bipolar disorder, 1 had psychosis NOS and 2 had schizophrenia. In the 6 individuals with a mood disorder, clozapine was added to a mood stabilizer (lithium or valproate). One patient developed neutropenia after 2 weeks of treatment and was excluded from analysis. The other 5 patients were followed for 24–46 months. At the end of treatment, the entire group had a CGI Efficacy Index [96] of 1.9 (moderate to marked improvement with minimal side effects). Results were similar for the subgroup of individuals diagnosed with a mood disorder. The authors conclude that clozapine is well tolerated and efficacious for the treatment of mania in DD patients and effectiveness does not appear to diminish with time.

In 2000 Antonacci and DeGroot [97] reported the results of a retrospective chart review for 33 patients with DD admitted to an acute psychiatric inpatient unit and treated with clozapine. Eleven had diagnoses of schizoaffective disorder, 3 had bipolar disorder, 2 had schizophrenia and 1 had psychotic disorder NOS. Patients were principally treated with clozapine alone ($N = 20$), clozapine plus valproate ($N = 13$), clozapine and a tapering dose of a traditional antipsychotic ($N = 3$) or clozapine and a tapering dose of a benzodiazepine ($N = 1$). Follow-up in the community showed sustained clinical improvement. Twenty-six of 33 patients remained on clozapine therapy for a follow-up duration of up to 48 months (range, 5–48 months; mean 24.8 months). CGI Efficacy Index [96] at the time of follow-up showed a mean rating of 5 (decided improvement and partial remission of symptoms with no interference from side effects). Side effects were mild and in no case required discontinuation of clozapine.

More recently, Thalayasingam et al. [98] described a case series of 24 patients treated with clozapine. Data was gathered through a retrospective chart review of all patients being treated with clozapine in a medium secure unit ($N = 15$), an assessment, treatment and rehabilitation unit ($N = 7$) and an outpatient clinic ($N = 2$) using a semistructured format. Two individuals had borderline cognitive disabilities, 17 had mild delays and 5 had moderate disabilities. The majority of patients had a diagnosis of schizophrenia ($N = 16$). Four had a schizoaffective disorder diagnosis and 2 had a bipolar affective disorder diagnosis. Two individuals had no mental illness diagnosis. All the patients had been symptomatic for a prolonged period of time with a mean of 6 years. They had been on a mean of 4 antipsychotics in the 5 years prior to clozapine. The principle measures of outcome were the global improvement and efficacy index scores of the CGI [96]. Five patients were found to have minimal improvement, 10 were much improved, 7 were very much improved and in 2 there was no change. Seventeen of the patients (71%) had efficacy indexes which showed marked to moderate improvement and side effects that did not significantly interfere with functioning. Two (8%) had side effects which far outweighed the therapeutic effect. Five (21%) had scores in between these two categories. Five patients had a pre-existing diagnosis of a seizure disorder. No worsening of seizures was found in this subgroup and no seizures were precipitated in any of the other patients. The authors note that most of the patients had been symptomatic for over 6 years and had failed multiple antipsychotics. After clozapine, more than 50% of these individuals were able to be removed from secure settings and placed in the community.

Williams et al. [99] reported the use of olanzapine and risperidone in 21 adults with intellectual disabilities in the mild ($N = 13$) and moderate ($N = 8$) range. Seventeen had psychiatric disorders. Eight had schizophrenia, 3 had delusional disorder, one had unspecified psychosis, two had affective disorders, one had neurotic disorder and 2 had

autism. Reasons for referral included treatment of psychotic symptoms (10 cases), control of challenging behaviors/aggression (9 cases), side effects from other antipsychotics (8 cases), and inadequate response to other antipsychotics (3 cases). More than one referral reason was permissible. Three individuals were on concurrent psychotropic medications during the study period. In the risperidone group, one person with schizophrenia was on sertraline and one with an affective disorder was on lithium. In the olanzapine group, the individual with the affective disorder was on amitryptyline. Outcome, as measured by the CGI scale, was rated as minimally improved or better in 16 cases (76%), no change in four cases (19%), and minimally worse in one case (5%). The individual with affective disorder taking both risperidone and lithium showed no improvement. The second individual with affective disorder was taking both olanzapine and amitryptyline and had minimal improvement.

Psychological Interventions

In the non-DD population, a number of psychotherapies are commonly used to treat mood disorders, either as the primary intervention or in combination with pharmacotherapy. There is empirical evidence for the effectiveness of CBT, IPT, and a cognitive-behavioral analysis system of psychotherapy in the treatment of depression [100]. The combination of medication and psychotherapy is particularly indicated in chronic depressive conditions. In bipolar affective disorder, CBT and IPT can be equally useful modalities and are often paired with pharmacotherapy, psychoeducation and family therapy. Interest in an integrated approach (medication, psychotherapy and combined approaches) to the treatment of mood disorders is increasing.

Historically, mental health professionals have believed that psychological interventions are ineffective in individuals with DD due to cognitive deficits and verbal limitations [101]. While some progress has been made in using both individual and group psychotherapy approaches to treat patients with DD, there has been a decided lack of research progress. The published literature consists of case studies and single case-designs. [102]. Published reports lack detail when describing the interventions used or the characteristics of the subjects. Interventions lack verifiability and non-standard measures are used to assess outcomes [103].

There is debate among experts in the field as to the usefulness of psychotherapeutic interventions vs. behavioral interventions in individuals with DD. Beail [104, 105] argues that the absence of evidence for efficacy of psychotherapy is not evidence of ineffectiveness and that the mental health needs of individuals with DD are becoming more clearly identified as being no different than those of the non-DD population. He draws attention to some of the limitations of the evidence base for behavioral interventions and notes that the evidence base has limited applicability to treatment of adults with mild disabilities or for those with mental health problems. Sturmey [106, 107] argues that behavioral interventions are effective and supported by empirical studies. He notes that the absence of well-conducted research precludes drawing any conclusions as to the effectiveness, ineffectiveness or harmful effects of psychotherapy. In response to Sturmey, Hurley [108] states that she has used psychotherapy to treat large numbers of people with mild mental retardation over the past 30 years and has found treatment responses to be favorable with patients achieving significant improvement in symptoms. She calls for more rigorous research on psychotherapy with people who have DD. Taylor [109] agrees that behavioral interventions are superior for individuals with severe levels of cognitive disability who present with challenging behaviors. However, behavioral interventions are less

effective when applied to low frequency, complex behavioral problems characteristic of individuals with milder disabilities. He notes that very few studies of behavioral interventions have targeted the mental health needs of these individuals and concludes that "it is probably premature and unhelpful to promote the superiority of behavioral approaches at the expense of psychotherapy for these clients." Finally, King [110] calls for the field to "proceed with compassion while awaiting the evidence" as inadequate outcome measures or a lack of effort in even attempting to measure outcomes most likely explains the current lack of knowledge in this area. He reminds the reader that practice-based evidence (versus evidence-based practice) exists and can inform the clinical efforts of therapists.

Research into cognitive factors related to symptoms of depression in individuals with DD has highlighted some important relationships. Frequency of negative automatic thoughts, self-reproach and feelings of hopelessness have shown to be significantly related to depressive symptoms in individuals with mild ID. Depressed individuals with mild DD report lower rates of self-reinforcement [111].

In a 2007 review of psychosocial interventions for people with intellectual disabilities and mental ill-health, Dagnan [112] summarizes the recent literature on individual interventions, interventions within the immediate social context of the person, interventions within the wider social context, and service structure for people with DD and mental illness. He notes that the majority of papers dealing with individual interventions were contained in a special edition of the Journal of Applied Research In Intellectual Disabilities, Volume 19, 2006. In this special edition, broad topics such as readiness for therapy and adaptation of therapy for individuals with DD were reviewed. Specific to mood disorders, Jahoda et al. [113] examined how the life experiences of people with DD might influence their self-perceptions and their vulnerability to depression. They discuss the potential for adaptation of existing CBT approaches and conclude that the same social cognitive processes which underpin the use of CBT for depression in the non-DD population can be found in individuals with DD.

McCabe and colleagues [114] described the development and evaluation of a group treatment program for individuals with mild/moderate DD. Thirty-four participants completed the program and 15 comprised a control group. Participants' scores on the Beck Depression Inventory (BDI) [115] were used to select individuals to participate in the study. The group included individuals with depressive syndromes as well as those with depressive symptoms who were at risk for developing depression. The mean BDI score for the intervention group was 14.56, SD = 4.51, and the mean BDI score for the control group was 13.60, SD = 4.44. The intervention included 5 sessions of 2 hours duration, delivered over 5 weeks. Each session covered one or two key areas, allowed for discussion and development of skills and included comprehensive handouts. Data was collected at 3 different assessment times: initial (pretest), post-test (one week after intervention) and follow-up (3 months). There was a statistically significant difference between the groups at all 3 times of assessment for the following variables: depression, social comparison and frequency of negative thoughts. The mean score on depression, social comparison and frequency of negative thoughts for the treatment group at post-test was significantly lower than the mean score for the treatment group at pre-test. The authors note that individuals who participated in the intervention viewed themselves more positively and had less frequent negative automatic thoughts after the treatment intervention. Both cognitive and behavioral manifestations of depression improved. They conclude that their study demonstrated the CBT intervention program they delivered was effective in reducing depressive symptoms both in the short and medium terms.

In 2007 Dosen [116] reported positive results with the use of a multidimensional treatment approach for individuals with DD and behavior problems and/or psychiatric disorders which he developed, based upon the success of integrative treatment approaches in general psychiatry. He notes that while the integrated application of medication treatment with psychotherapy and psychiatric management is receiving increasing attention within general psychiatry, the DD field remains biologically reductionistic. In persons with DD and mental health problems, the emphasis is still on a one-treatment method, usually psychotropic medication or behavior therapy. Dosen's model [117, 118] takes into account the traditional dimensions of biological, psychological and social factors but adds the important dimension of developmental factors which are pertinent to the assessment, diagnosis and treatment of individuals with DD. He describes this model as it is used to treat severe depression and dysthymic disorder, offering a case vignette.

Esbensen [119] evaluated Beck's cognitive theory of depression in 60 adults with mild or moderate disabilities to determine its appropriateness in this population. The authors examined whether the cognitive triad could be readily measured and whether or how it was related to depression. Subjects were recruited from community residential agencies and divided into 2 groups: individuals with no psychiatric diagnoses (the non-depression group $N = 48$) and individuals with diagnoses of major depressive disorder found in their medical files (the depression group $N = 12$). The Cognitive Triad Inventory for Children was adapted and simplified from the original Cognitive Triad Inventory [120, 121]. Additionally, the Self-Report Depression Questionnaire (SRDQ) [122], an adapted Piers-Harris Children's Self-Concept Scale (PH-SCS) [123], and Hopelessness Scale for Children (HSC) [124] were used to measure outcomes. The authors conclude that individuals with DD could self-report on the CTI-C. The instrument displayed adequate psychometric properties and was correlated with depressed mood in this population. They caution that users should focus on the total score and the future subscale as the self subscale did not have good internal consistency or retest reliability. Individuals diagnosed with depression had significantly higher scores on the CTI-C than those with no psychiatric diagnosis. Based upon these preliminary results, a potential target for treatment might include negative thoughts related to the cognitive triad. Over a span of 4 months, a negative cognitive triad was not found to be a risk factor for depression. The inverse relationship of depressed mood leading to a negative triad as measured by the CTI-C approached statistical significance. The authors comment that this aspect of the cognitive theory of depression may not be an appropriate construct for individuals with DD.

Conclusions

Mood disorders are common in individuals with developmental disabilities. More recent epidemiological surveys using community samples find that the prevalence of mood disorders is higher than anxiety disorders or psychotic disorders. Misdiagnosis and under-recognition continue to be a problem. Individuals with mild cognitive disabilities have presentations similar to the non-DD population and can be assessed using standard practices with some minor accommodations. New diagnostic tools should enhance clinicians' and researchers' abilities to make accurate diagnoses. Self-report instruments which can be used with more verbal individuals are in the process of being developed and validated and show promise. A variety of informant rating scales have been used across studies, demonstrating advances in efforts to provide a variety of assessment tools, especially relevant for individuals with more severe levels of disability. Atypical presentations and the theory

that aggression and self-injury are "behavioral equivalents" of mood disorders continue to be studied, with no firm conclusion as to the validity of the concept. While advances have been made in the areas of epidemiology, assessment and diagnosis, research on treatment continues to be inadequate. The literature, while sparse, is focused primarily on pharmacological interventions. Debate regarding the appropriateness of psychotherapeutic interventions versus behavioral interventions in DD individuals continues. Treatment studies should be undertaken to test the feasibility, safety and efficacy of all treatments for mood disorders currently offered to the non-DD population. Risk factors, family history and the relationship between community supports, life events and mood disorders should be further explored.

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Author Biographies

Diana J. Antonacci, M.D. is associate professor and Director of Residency Training in the Department of Psychiatric Medicine in the Brody School of Medicine at East Carolina University. She is a diplomate of the American Board of Psychiatry and Neurology in Adult and in Child and Adolescent Psychiatry. She has 15 years experience treating individuals with developmental disabilities.

Nadir M. Attiah, M.D. is a fourth year resident in the Department of Psychiatric Medicine in the Brody School of Medicine at East Carolina University.