Rates and Stability of Mental Health Disorders in Children Born Very Preterm at 7 and 13 Years

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abstract

OBJECTIVES: Children born very preterm (VPT) are at an increased risk of developing mental health (MH) disorders. Our aim for this study was to assess rates of MH disorders in children born VPT and term at 13 years of age and stability of MH disorders between ages 7 and 13 years by using a diagnostic measure.

METHODS: Participants were from the Victorian Infant Brain Study longitudinal cohort and included 125 children born VPT (<30 weeks’ gestational age and/or <1250 g) and 49 children born term (≥37 weeks’ gestational age) and their families. Participants were followed-up at both 7 and 13 years, and the Development and Well-Being Assessment was administered to assess for MH disorders.

RESULTS: Compared with term peers, 13-year-olds born VPT were more likely to meet criteria for any MH disorder (odds ratio 5.9; 95% confidence interval 1.71–20.03). Anxiety was the most common disorder in both groups (VPT = 14%; term = 4%), whereas attention-deficit/hyperactivity disorder carried the greatest differential elevated risk (odds ratio 5.6; 95% confidence interval 0.71–43.80). Overall rates of MH disorders remained stable between 7 and 13 years, although at an individual level, many participants shifted in or out of diagnostic categories over time.

CONCLUSIONS: Children born VPT show higher rates of MH disorders than their term peers, with changing trajectories over time. Findings highlight the importance of early identification and ongoing assessment to support those with MH disorders in this population.

WHAT’S KNOWN ON THIS SUBJECT: Children born very preterm are at a higher risk of developing mental health disorders. Many studies favor a symptom-based (dimensional) measurement of mental health in this population, as opposed to diagnostic criteria that are indicative of clinically significant distress or impairment.

WHAT THIS STUDY ADDS: This study was novel in our use of a measure based on Diagnostic and Statistical Manual of Mental Disorders, and we compared the stability of diagnoses across multiple time points. Findings suggest caution when assigning and interpreting diagnostic labels in this population throughout development.
Survival rates for children born very preterm (VPT) (<32 weeks’ gestation) have increased because of medical advances. However, many of these children experience neurodevelopmental difficulties beyond those of their term peers, with more severe impairments associated with shorter gestational ages. Of particular concern is that children born VPT are more likely to be diagnosed with a mental health (MH) disorder. A preterm behavioral phenotype of psychopathology (ie, attentional, social, and emotional difficulties) has been proposed through symptom-based measures (ie, severity of symptoms on a scale) and supported through limited studies using diagnostic measures (ie, Diagnostic and Statistical Manual of Mental Disorders [DSM]). Attentional issues appear most prevalent in childhood, with children born VPT 4 times more likely to meet diagnostic criteria for attention-deficit/hyperactivity disorder (ADHD) than their term peers at school age. Rates of autism spectrum disorders (ASDs) are also 2 to 5 times higher in children born VPT, with 4% to 11% meeting criteria, whereas population estimates are ~2.5%. Regarding emotional difficulties, interpretations of findings are complicated by the fact that specific mood and anxiety disorders have differing peak ages of onset and patterns of risk but are often reported together under broad terms, such as “anxiety disorder,” or with broad age ranges. For example, separation anxiety and certain specific phobias tend to emerge in childhood, whereas panic disorder and generalized anxiety disorder (GAD) often emerge in adulthood; for some, there may even be a transitional process from one anxiety disorder to another. Research suggests that children born VPT are ~1.5 times more likely to develop any anxiety disorder than are children born term. Rates of mood disorder vary greatly depending on age of assessment. Different findings are possibly explained by variation in cohorts, such as degree of prematurity, and key methodologic differences. Firstly, methods used to measure MH differ between studies. In most studies historically, researchers have employed dimensional symptom-based measures of psychopathology (some with a cutoff point of clinical concern). More recently, authors of some studies have used categorical diagnostic measures (based on DSM or International Classification of Diseases criteria) that require administration or scoring by a clinician; however, for both approaches, many different tools have been applied. Secondly, the age of assessment differs across studies, which is problematic because certain disorders are more likely to emerge at particular developmental stages (eg, ADHD at early school age, depression in adolescence) and may fluctuate with changing life circumstances and the provision of treatment. This can result in a changing diagnostic trajectory when evaluating children for MH disorders across time points. In some studies, researchers have attempted to track the stability of MH diagnoses in preterm populations longitudinally, for example, early childhood socioemotional problems appeared to predict an increased risk for later childhood MH diagnoses in studies by both Johnson et al and Treyvaud et al. This is consistent with the theory of sequential comorbidity, in which children have an increased likelihood of developing new or changing psychopathologies before which any had previously existed.

Varying severity of symptoms over time may also be observed at an individual level. A study by Gray et al in which the authors assessed behavioral symptoms in very low birth weight children at multiple time points across early childhood (3, 5, and 8 years) revealed that only 5.4% of children met a clinical cutoff at all 3 time points. In a similar study, Miller et al assessed children at 5 and 8 years and found that only 6.5% met a clinical cutoff at both time points. In a recent study, Johnson et al tracked diagnostic data at 11- and 19-year time points in an extremely preterm (<26 weeks) cohort and found that the presence of an MH disorder at 11 years was associated with a more than threefold increased risk of self-reported avoidant personality symptoms at 19 years. Those with an MH disorder at 11 years were also at higher risk (risk ratio = 1.82) of meeting criteria for a common MH disorder, such as depression or anxiety, at 19 years, as assessed by using a structured clinical interview (Clinical Interview Schedule–Revised); however, this finding did not retain significance when controlling for age, sex, and socioeconomic factors. In summary, there remains a lack of research focused on the stability of MH diagnoses in preterm populations across multiple time points by using clinical interview measures. Further research is warranted to understand unique periods of MH vulnerability, which is important for determining when screening and intervention may be appropriate. This knowledge may also assist in predicting longer-term outcomes in children born VPT and in identifying those in need of additional support.

Our first aim for this longitudinal study was to compare the overall (ie, any disorder) and disorder-specific rates of MH diagnoses in a cohort of children born VPT with those in their term peers at age 13 years by using a diagnostic measure. Our second aim was to describe the longitudinal stability of MH diagnoses from age 7 to 13 years in children born VPT compared with their term peers. It was hypothesized that children born VPT would have a greater likelihood of meeting criteria for any overall MH
diagnosis at 13 years, including higher rates of ADHD, ASD, depression, and anxiety, when compared with their term peers. It was also hypothesized that most children with any MH disorder diagnosis at age 7 would retain a diagnosis at age 13 in both preterm and term children.

**METHODS**

**Longitudinal Design**

This research was completed in the context of the Victorian Infant Brain Study (VIBeS) longitudinal cohort. Medical, social, and neurodevelopmental data have been collected at birth and at 2, 5, 7, and 13 years of age (all corrected for prematurity). Diagnostic MH data were collected at 7 and 13 years.

**Participants and Procedure**

The VIBeS cohort comprises 224 children born VPT. All children born between 2001 and 2003 at The Royal Women’s Hospital (RWH) in Melbourne with a gestational age of <30 weeks and/or a birth weight of <1250 g and no major congenital abnormalities were eligible for inclusion in the VPT study group. A control group of 77 term (>36 weeks), normal birth weight peers (>2499 g) were also recruited at birth at RWH (n = 46) or at 2 years of age from maternal and child health centers (n = 31). At the 7-year follow-up, 191 of 224 (85%) children born VPT and 69 of 77 (89%) controls and their families were retained, with diagnostic data available for 177 (79%) and 65 (84%) of the original cohorts, respectively. At the 13-year follow-up, 179 children born VPT (80%) and 62 born term (81%) were retained, with diagnostic data available for 125 (56%) children born VPT and 49 (64%) term children from the original cohorts. Of the total participants originally recruited (n = 301), 60 (20%) withdrew, declined, or were not able to be contacted, and 67 (22%) did not have parents complete the relevant outcome measure (Developmental and Well-Being Assessment [DAWBA]). All parents provided written consent for their children to participate. The study was approved by Human Research Ethics Committees of RWH and The Royal Children’s Hospital.

**Measures**

Sociodemographic data were collected at birth and each follow-up point. At both 7 and 13 years, social risk was rated on a scale of 0 to 12, with ratings composed of maternal birth age, family structure, primary caregiver education level, occupation or employment status of primary income earner, and language spoken at home. Higher scores reflected higher social risk. Neurodevelopmental disability was also assessed, defined as an IQ <70 or neurosensory impairment based on moderate to severe cerebral palsy, visual acuity worse than 20/200 in the better eye, or any hearing loss requiring hearing aids.

Psychiatric diagnoses at the 7- and 13-year time points were assessed by using the DAWBA. The DAWBA is a parent-report measure providing estimates of (1) the overall rate of diagnosis (presence or absence) and (2) the specific diagnostic presence or absence across a range of Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition [DSM-IV] and Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition [DSM-5] criteria. Parents complete an online structured clinical interview regarding their child. The program then generates flags surrounding possible diagnoses, and qualified raters (experienced with DSM criteria) review parent responses and open-ended comments to confirm or rule out MH diagnoses. Seven-year data were assessed by using DSM-IV criteria, whereas 13-year data were assessed by using DSM-5 criteria because these were published within the interim period. Both DSM-IV and DSM-5 criteria were used to assess ASD at 13 years given diagnostic changes for ASD between the DSM-IV and DSM-5. For the current study, a clinical psychologist and a provisional psychologist made independent DAWBA ratings then compared outcomes, resolving any incongruent cases via discussion. Initial interrater reliability was 88.4%, reaching 100% agreement after discussion of individual cases.

**Data Analysis**

Data were analyzed by using Stata version 13.0 statistical software (Stata Corp, College Station, TX). Independent sample t tests, Mann-Whitney U tests, and χ² tests were used to compare demographic variables between families who did or did not complete the 13-year DAWBA. To compare diagnostic rates between children born VPT and term, separate logistic regression models were run, and odds ratios (ORs) were calculated with 95% confidence intervals (CIs). When statistically significant group differences were identified, logistic regression equations were rerun with social risk and neurodevelopmental disability included as covariates to produce adjusted ORs. A reliability analysis by using the k statistic was used to assess consistency of individual diagnoses, and McNemar’s test was used to assess systematic change in diagnostic prevalence between 7 and 13 years of age.

**RESULTS**

Children with and without DAWBA data at the 13-year time point did not differ significantly on rates of neurosensory impairment, mean gestational age, or proportion of DAWBA diagnoses at the 7-year time point. However, the median social risk was higher for noncompleting families than for completing families (Supplemental Table 4). For children with complete DAWBA data at age 7 years, 68% also had complete data.
were more prevalent in the VPT term group. Diagnostic comorbidities diagnoses, particularly within the cases for some of the individual was weak, and there were few or no evidence for real group differences children born VPT. However, the appeared to be a higher rate of ASD in for these disorders. There also born VPT more likely to meet criteria disorders and ADHD, with children diagnostic categories were anxiety neurodevelopmental disability and a small reduction after adjusting for social risk. The most prevalent previously occurring condition was separation anxiety disorders (27.8%). Of the 20 children with diagnoses present at the 13-year time point only, the most prevalent newly occurring conditions were ASD (20%), GAD (20%), and inattentive ADHD (20%).

**DISCUSSION**

In the current study, we found that compared with term peers, children born VPT were 5 times more likely to meet criteria for an MH disorder at age 13 years. For children with complete DAWBA data at age 13 years, 94% also had complete data at age 7 years. This resulted in 163 children with DAWBA data across both time points. **MH Outcomes**

At 13 years’ corrected age, children in the VPT group had nearly 6 times the odds of meeting criteria for any MH diagnosis than their term peers (27.2% vs 6.1%; Table 1), with only a small reduction after adjusting for neurodevelopmental disability and social risk. The most prevalent diagnostic categories were anxiety disorders and ADHD, with children born VPT more likely to meet criteria for these disorders. There also appeared to be a higher rate of ASD in children born VPT. However, the evidence for real group differences was weak, and there were few or no cases for some of the individual diagnoses, particularly within the term group. Diagnostic comorbidities were more prevalent in the VPT group. Of the 125 children born VPT, 24 (19.2%) met criteria for 1 DSM-5 disorder, 5 (4.0%) for 2 disorders, 3 (2.4%) for 3 disorders, and 2 (1.6%) for ≥4 disorders. Of the 49 term children, 1 (2.0%) met criteria for 1 DSM disorder, 1 (2.0%) for 2 disorders, 1 (2.0%) for 3 disorders, and none for ≥4 disorders ($\chi^2$ for trend = 5.1; $P = .025$).

**Stability Outcomes**

For the 163 children for whom 7- and 13-year diagnostic data were present, there was only fair consistency of diagnosis between time points at an individual level ($\kappa$ = 0.28; $P < .001$). McNemar’s test revealed no systematic change in the overall proportions of clinical diagnoses between the time points ($\chi^2$ = 0.11; $P = .87$), although 20 children changed categories from no clinical diagnosis to clinical diagnosis and 18 children changed categories in the reverse direction (clinical diagnosis to no clinical diagnosis), resulting in near symmetry in overall proportions (see Table 2). Specific diagnostic categories revealed a similar pattern; $\kappa$ reliability analyses revealed moderate consistency within ADHD ($\kappa$ = 0.45; $P < .001$) but only fair consistency within ASD ($\kappa$ = 0.31; $P < .001$) and mood disorders ($\kappa$ = 0.39; $P < .001$) and little consistency in anxiety disorders ($\kappa$ = 0.11; $P = .17$; Table 3).

Of the 18 children with diagnoses present at the 7-year time point only, the most prevalent previously occurring condition was separation anxiety (27.8%). Of the 20 children with diagnoses present at the 13-year time point only, the most prevalent newly occurring conditions were ASD (20%), GAD (20%), and inattentive ADHD (20%).

**TABLE 1 DSM-5 Diagnoses at 13 Years**

<table>
<thead>
<tr>
<th>Neurodevelopmental disorders</th>
<th>VPT (n = 125)</th>
<th>Term (n = 49)</th>
<th>Unadjusted OR (95% CI)</th>
<th>$P$</th>
<th>Adjusted OR (95% CI)</th>
<th>$P$</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADHD, any</td>
<td>13 (10.4)</td>
<td>1 (2.0)</td>
<td>5.57 (0.71–43.80)</td>
<td>.10</td>
<td>4.75 (0.59–38.20)</td>
<td>.14</td>
</tr>
<tr>
<td>ASD, DSM-5 criteria</td>
<td>7 (5.6)</td>
<td>1 (2.0)</td>
<td>2.85 (0.34–23.77)</td>
<td>.33</td>
<td>1.79 (0.20–16.48)</td>
<td>.61</td>
</tr>
<tr>
<td>Anxiety disorders</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any anxiety disorder</td>
<td>18 (14.4)</td>
<td>2 (4.1)</td>
<td>3.95 (0.88–17.73)</td>
<td>.07</td>
<td>3.96 (0.87–17.93)</td>
<td>.07</td>
</tr>
<tr>
<td>GAD</td>
<td>8 (6.4)</td>
<td>1 (2.0)</td>
<td>3.28 (0.40–29.98)</td>
<td>.27</td>
<td>3.75 (0.45–30.68)</td>
<td>.22</td>
</tr>
<tr>
<td>Separation anxiety</td>
<td>1 (0.8)</td>
<td>--</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>Specific phobia</td>
<td>4 (3.2)</td>
<td>1 (2.0)</td>
<td>1.58 (0.17–14.56)</td>
<td>.68</td>
<td>1.33 (0.13–13.15)</td>
<td>.81</td>
</tr>
<tr>
<td>Social anxiety</td>
<td>6 (4.8)</td>
<td>1 (2.0)</td>
<td>2.42 (0.28–20.64)</td>
<td>.42</td>
<td>2.74 (0.32–23.42)</td>
<td>.36</td>
</tr>
<tr>
<td>Panic</td>
<td>--</td>
<td>0 (0)</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other anxiety disorder</td>
<td>2 (1.6)</td>
<td>--</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mood disorders</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any mood disorder</td>
<td>3 (2.4)</td>
<td>1 (2.0)</td>
<td>1.18 (0.12–11.63)</td>
<td>.89</td>
<td>1.33 (0.14–13.15)</td>
<td>.81</td>
</tr>
<tr>
<td>Depression</td>
<td>2 (1.6)</td>
<td>1 (2.0)</td>
<td>0.88 (0.08–9.95)</td>
<td>.92</td>
<td>0.78 (0.07–8.81)</td>
<td>.84</td>
</tr>
<tr>
<td>Bipolar disorder</td>
<td>--</td>
<td>0 (0)</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other depressive disorder</td>
<td>1 (0.8)</td>
<td>--</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other disorders</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OCD</td>
<td>1 (0.8)</td>
<td>0 (0)</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ODD</td>
<td>1 (0.8)</td>
<td>0 (0)</td>
<td>--</td>
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<td></td>
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<tr>
<td>Conduct disorder</td>
<td>0 (0)</td>
<td>0 (0)</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>PTSD</td>
<td>1 (0.8)</td>
<td>0 (0)</td>
<td>--</td>
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<td></td>
</tr>
<tr>
<td>Eating disorder</td>
<td>0 (0)</td>
<td>0 (0)</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tic disorder</td>
<td>4 (3.2)</td>
<td>0 (0)</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any DSM-5 disorder</td>
<td>34 (27.2)</td>
<td>5 (6.1)</td>
<td>5.85 (1.71–20.03)</td>
<td>.01</td>
<td>4.93 (1.42–17.13)</td>
<td>.01</td>
</tr>
</tbody>
</table>

OCD, obsessive-compulsive disorder; ODD, oppositional defiant disorder; PTSD, posttraumatic stress disorder; --, not applicable.
age 13. More than one-quarter of children born VPT (27.2%) met criteria for at least 1 MH disorder. The rate at 13 years is consistent with the rate of 24% at 7 years in the same cohort as well as with rates in other preterm cohorts by using the same standardized parent-report measure (ie, 23.3% and 30%).5,7

Anxiety disorders were the most commonly occurring diagnosis in both groups, but were fourfold higher in the VPT group. Anxiety was also the most common diagnosis at 7 years, but rates were not substantially different in VPT (11%) and control (8%) groups. This finding is consistent with the prevalence rates in the 2015 Australian Child and Adolescent Survey of Mental Health and Wellbeing revealing anxiety as the highest-prevalence disorder, at a population rate of 7% in 11- to 17-year-olds.22 However, ADHD carried the greatest differential elevated risk for children born VPT, who were 5.5 times more likely to meet criteria than their term peers and remained 5 times more likely when controlling for neurodevelopmental disability. Children born VPT also showed close to 3 times the risk of ASD; however, only one term child met criteria for this diagnosis, and risk again decreased when controlling for comorbid neurodevelopmental disability. Notably, controlling for neurodevelopmental disability had the greatest impact on the ORs for the neurodevelopmental disorders of ADHD and ASD. This may suggest an indirect causal pathway between preterm birth and such MH outcomes, via disability or developmental delay.23 Previous research from our group with the current cohort also revealed early brain abnormalities, elevated social risk, and socioemotional problems in earlier childhood as important risk factors for psychiatric disorder at 7 years of age (Treyvaud et al6). Early psychological experiences (eg, stress in the NICU and reduced capacity for parental bonding due to frailty or sensory impairments) may also play a role in later social, emotional, and behavioral psychopathology.24,25

For children with MH assessment data at both time points, overall systematic rates of clinically significant MH disorders remained stable between 7- and 13-year time points. However, on an individual level, only 14 children met criteria for a disorder at both time points, with 20 children independently moving into the diagnostic group between time points and 19 children leaving it. This finding may represent a larger group of “subthreshold” children being detected but not consistently meeting diagnostic criteria at each time point. This explanation is supported by slightly higher (and comparable) rates of subthreshold concern reported by using symptom-based measures in similar populations.26,27 Patterns of stability for specific disorders also reveal expected maturational changes, for example, despite a steady rate of overall anxiety disorders, there were reduced rates of separation anxiety and phobia and increased rates of GAD and social anxiety.11,12 Rates of ASD revealed an increase; this may reflect cases of late diagnosis, in which subtle impairments were only detected with the increasing functional demands of late childhood or early adolescence.28,29

TABLE 2 Proportion of Patients With and Without DAWBA Diagnoses at 7 and 13 Years

<table>
<thead>
<tr>
<th>13-y Time Point</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Diagnosis</td>
<td>Yes Diagnosis</td>
</tr>
<tr>
<td>No diagnosis</td>
<td>111a</td>
</tr>
<tr>
<td>Yes diagnosis</td>
<td>18</td>
</tr>
<tr>
<td>Total</td>
<td>129</td>
</tr>
</tbody>
</table>

a Children with consistent DAWBA status across both time points.

TABLE 3 Disorder-Specific Proportion and Stability of DAWBA Diagnoses

<table>
<thead>
<tr>
<th></th>
<th>7 y, n (%)</th>
<th>Total</th>
<th>13 y, n (%)</th>
<th>Total</th>
<th>Increased or Decreased Prevalence</th>
<th>No. Patients Consistenta</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>VPT (n = 116)</td>
<td>Term (n = 47)</td>
<td>VPT (n = 116)</td>
<td>Term (n = 47)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ADHDs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ADHD, any</td>
<td>13 (11.2)</td>
<td>1 (2.1)</td>
<td>14 (11.2)</td>
<td>1 (2.1)</td>
<td>Steady</td>
<td>7</td>
</tr>
<tr>
<td>Anxiety disorders</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anxiety, any</td>
<td>13 (11.2)</td>
<td>3 (6.4)</td>
<td>16 (13.8)</td>
<td>1 (2.1)</td>
<td>Increased</td>
<td>3</td>
</tr>
<tr>
<td>Mood disorders</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depression, any</td>
<td>1 (0.9)</td>
<td>1 (2.1)</td>
<td>3 (2.5)</td>
<td>—</td>
<td>Increased</td>
<td>1</td>
</tr>
<tr>
<td>ASDs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ASD, DSM-IV criteria</td>
<td>4 (3.4)b</td>
<td>—</td>
<td>4 (6.0)</td>
<td>—</td>
<td>Increased</td>
<td>2</td>
</tr>
<tr>
<td>ASD, DSM-5 criteria</td>
<td>7 (6.0)</td>
<td>1 (2.1)</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any DSM-5 disorder</td>
<td>28 (24.1)</td>
<td>4 (8.5)</td>
<td>32 (27.6)</td>
<td>2 (4.3)</td>
<td>Increased</td>
<td>14</td>
</tr>
</tbody>
</table>

Includes only children with DAWBA data at both time points (n = 163). —, not applicable.
a No. individuals who fell into this same category at both time points.
b n = 1 missing data for this category.
individual level, diagnostic trajectory appears similar to that of recently published findings, in that 44% of those with an MH disorder at 7 years retained any overall diagnosis at 13 years, and the same was true for 44% between 11- and 19-year time points in a recent study by Johnson et al.21 However, it is important to consider differences in the age range, pubertal stage, attrition rates, and degree of prematurity between these 2 studies.

Furthermore, although diagnostic measures effectively capture cases that result in functional impairment, they may not adequately represent children with complex profiles of neurodevelopmental disability and/or several comorbid MH concerns. Findings also do not reflect changes over time for children for whom severity has increased or decreased within diagnostic borders (eg, a child who meets criteria for 1 disorder, whereas previously they have met criteria for several) or cases that have changed in diagnostic profile (eg, a child who might have previously met multiple criteria representing social and/or emotional impairments may now have a revised single diagnosis, such as ASD). Here, dimensional symptom-based measures remain useful, and, ideally, future researchers should incorporate both symptom-based and diagnostic tools, especially when convergent validity between chosen measures has been pre-established.

This study had methodologic limitations. Pubertal development may influence the onset of specific MH disorders,30 but we did not assess pubertal stage. Although there may be disparities between parent-child symptom reporting in early adolescence,31 this study was reliant on parent-report as a means of investigating stability over time. Future researchers should consider both self- and parent-reported symptoms. We also note that reporter bias is a potential limitation. For example, it has been previously reported that parents of children born VPT may be at risk for over-reporting symptoms on the basis of previously assigned labels or for “priming” to notice symptoms in the context of other developmental vulnerabilities.22 The small sample size in the control group also presents a limitation. General population prevalence of anxiety, depression, ADHD, and ASD is higher than what is shown in this particular cohort.22

A subsequent follow-up of the study cohort (eg, early adulthood) would be valuable in (1) further assessing diagnostic stability and (2) exploring the emergence and/or recession of developmentally oriented MH disorders (ie, depression and anxiety). It would also be valuable to explore additional risk factors emerging in later adolescence. Present study findings carry implications for clinicians (eg, drawing awareness to vulnerable periods along with complexities inherent in diagnostic labels) in a group likely to experience increased risk for physical, mental, and neurodevelopmental comorbidities. There are also implications for caregivers, whose access to certain support resources may be determined by the presence or absence of diagnoses. For this reason, the continuing exploration of diagnostic stability in children born preterm is warranted.

CONCLUSIONS

Children born VPT show higher rates of MH disorders than children born term at age 13 years, with evidence of changing individual diagnostic trajectories over time. These findings highlight the importance of early identification and continuing assessment to support those with MH disorders in this population.

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ABBREVIATIONS

ADHD: attention-deficit/hyperactivity disorder
ASD: autism spectrum disorder
CI: confidence interval
DAWBA: Development and Well-Being Assessment
DSM: Diagnostic and Statistical Manual of Mental Disorders
DSM-5: Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition
DSM-IV: Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition
GAD: generalized anxiety disorder
MH: mental health
OR: odds ratio
RWH: The Royal Women’s Hospital
VIBeS: Victorian Infant Brain Study
VPT: very preterm

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