Introduction

Obsessive-compulsive disorder (OCD) is recognized as a prevalent and persistent neuropsychiatric condition, impacting an estimated 2% to 3% of individuals worldwide (de Mathis et al., 2013). The disorder commonly arises in early life and is characterized by the presence of compulsions – ritualized behavioral or mental acts, and obsessions – intrusive and unwanted thoughts and worries (Karno et al., 1988). OCD is unique among mental illnesses in that it exhibits both externalizing and internalizing symptoms (Guzick et al., 2019). Externalizing features, like compulsivity and repetitive actions, are often outwardly disruptive and align with disorders such as attention-deficit/hyperactivity disorder (ADHD) and disruptive behavior disorders. In contrast, internalizing aspects, including anxiety, concerns, and obsessions, cause internal distress and align with conditions like depressive and anxiety disorders, often leading to avoidance or withdrawal (Achenbach, 2001). Understanding OCD within this dual framework enhances our grasp of its complexity and informs more effective therapeutic strategies. These frameworks are not only therapeutically beneficial but are also supported by empirical research (Kessler et al., 2011; Slade & Watson, 2006).

Gathering information about a child’s functioning typically involves input from multiple informants, including the child and parents (Achenbach, 2006). Mental health issues can vary across different contexts (Bauducco et al., 2024; Beesdo et al., 2009). Children and adolescents may exhibit mental health concerns in certain environments, such as at home or school, but not in others, like during peer interactions. These contextual variations are evident across various domains, including conduct problems, attention, hyperactivity, and anxiety (Beesdo et al., 2009).

However, the reliability of parent reports for assessing children's experiences, especially for non-observable functions like emotions, has been questioned (Eiser & Morse, 2001). Parental assessments often differ from children’s self-perceptions, potentially due to biases, superficial observations, or the nature of the parent-child relationship. Conversely, children frequently lack objective self-perception (Barrett et al., 1991; Martin et al., 2004). Research indicates discrepancies and varying accuracy in symptom reporting, with no clear consensus on which group reports internalized symptoms more accurately, while parents tend to be more precise in identifying externalized (Silverman & Eisen, 1992).

Research question: To what extent does structural brain data explain the variation in anxiety symptoms as reported by youths versus their parents?

Hypothesis:  There will be a significant difference in the prediction accuracy of structural brain data between self-reported and parent-reported anxiety symptoms in adolescents with GAD, with an expectation of higher accuracy for self-reported symptoms.

Sample:

* OCD scores by race/ethnicity
* post distributions: internalizing children vs parents and externalizing children vs parents
  + age, sex, socio economic

**Clinical characteristics (Parent reported):**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Characteristic  N (%) | Full Sample  (10756) | OCD absent  (10068) | OCD present  (662) | Group difference | Effect size |
| **KSADs Lifetime diagnosis** | | | | | |
| Any depressive disorder | 44(0.41%) | 35(0.35%) | 9(1.36%) | =13.19 | OR= |
| Any anxiety disorder | 286(2.66%) | 191(1.90%) | 95(14.35%) | =366.34 | OR= |
| ADHD | 635(5.90%) | 516(5.13%) | 119 (17.98%) | =181.75 | OR= |
| ODD/CD | 630(5.86%) | 523(5.19%) | 107(16.16%) | =133.24 | OR= |
| Bipolar | 228(2.12%) | 148(1.47%) | 80 (12.08%) | =331.43 | OR= |
| Drug use disorder | 26(0.24%) | 19(0.19%) | 7 (1.06%) | =15.96 | OR= |
| Any suicidality | 345(3.21%) | 271(2.69%) | 74(11.18%) | =141.05 | OR= |
| Any eating disorder | 118(1.10%) | 89(0.88%) | 29(4.38%) | =66.61 | OR= |
| No diagnosis | 9105(84.65%) | 8748(86.88%) | 357(53.93%) | =3114.60?? | OR= |
| **CBCL T-score** | | | | | |
| Mean (SD) | (10773) | (10733) | (660) |  |  |
| DSM-5 Anxiety | 53.37(5.92) | 52.94(5.36) | 59.81(9.21) |  |  |
| DSM-5 Depression | 53.76(5.94) | 53.43(5.62) | 58.91(8.00) |  |  |
| DSM-5 Somatic | 54.79(6.26) | 54.58(6.07) | 58.03(7.96) |  |  |
| DSM-5 ADHD | 53.10(5.33) | 52.84(5.09) | 57.06(7.13) |  |  |
| DSM-5 Opposite | 53.04(5.03) | 52.85(4.83) | 55.96(6.91) |  |  |
| DSM-5  Conduct | 52.39(4.80) | 52.21(4.57) | 55.04(6.88) |  |  |
| OCD | 53.30(5.72) | 52.82(5.03) | 60.68(9.38) |  |  |
| Total problem score | 44.64(11.41) | 43.92(11.11) | 55.60(10.26) |  |  |

\*NA = adhd=6, depressive disorder = 4, anxiety = 4, eating disorder = 4, no diagnosis =4

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Comorbidities | OCD absent | OCD present | Group diff | Effect size |
| No (other) diagnosis | 8748 | 357 |  |  |
| 1 | 962 | 174 |  |  |
| 2 | 257 | 76 |  |  |
|  | 95 | 55 |  |  |

**Demographic characteristics (parent reported):**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Characteristic | Full sample  (10711) | OCD absent  (10049) | OCD present  (662) | Group difference | Effect size |
| Age | 9.48(0.51) | 9.48(0.51) | 9.46(0.50) |  |  |
| Sex, Female | 5096(47.58%) | 4777(47.54%) | 319(48.19%) |  |  |
| Pubertal status |  |  |  |  |  |
| Perinatal |  |  |  |  |  |
| Race, white | 5746(53.65%) | 5415(53.89%) | 331(50.00%) |  |  |
| Race, hispanic | 2098(19.59%) | 1970(19.60%) | 128(19.34%) |  |  |
| Parental marital status, married | 7227(67.47%) | 6838(68.05%) | 389(58.76%) |  |  |
| Parental education |  |  |  |  |  |
| Parental income | 7.53(2.32) | 7.57(2.29) | 6.99(2.63) |  |  |
| General SES |  |  |  |  |  |
| Social functioning |  |  |  |  |  |
| NIH toolbox – cognition total |  |  |  |  |  |
| Family conflict – child report |  |  |  |  |  |
| Family conflict – parent report |  |  |  |  |  |
| Usable structural data | 7969 | 7495 | 474 |  |  |

**Itemwise CBCL OCS characterization:**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| CBCL OCS item | Score | Full sample  (10898) | | OCD absent (10048) | |  | OCD present (660) | |
| 9- cannot get his/her mind off certain thoughts; obsessions | 0 | 8264(75.83%) | 7890(78.52%) | | 239(36.21%) | | |
| 1 | 2198(20.17%) | 1854(18.45%) | | 304(46.06%) | | |
| 2 | 436(4.00%) | 304(3.03%) | | 117(17.73%) | | |
| 31- feels he/she might think or do something bad | 0 | 10177(93.38%) | 9492(94.47%) | | 516(78.18%) | | |
| 1 | 654(6.00%) | 514(5.12%) | | 121(18.34%) | | |
| 2 | 66(0.61%) | 42(0.42%) | | 23(3.48%) | | |
| 32- feels he/she has to be perfect | 0 | 7993(73.34%) | 7511(74.75%) | | 347(52.58%) | | |
|  | 1 | 2484(22.79%) | 2210(21.99%) | | 226(34.24%) | | |
|  | 2 | 420(3.85%) | 327(3.25%) | | 87(13.18%) | | |
| 52- feels too guilty | 0 | 10226(93.83%) | 9518(94.73%) | | 532(80.61%) | | |
|  | 1 | 609(5.59%) | 487(4.85%) | | 109(16.52%) | | |
|  | 2 | 62(0.57%) | 43(0.43%) | | 19(2.88%) | | |
| 66- Repeats certain acts over and over: compulsions | 0 | 10293(94.45%) | 9692(96.46%) | | 432(65.45%) | | |
| 1 | 508(4.66%) | 313(3.12%) | | 181(27.42%) | | |
| 2 | 96(0.88%) | 43(0.43%) | | 47(7.12%) | | |
| 84- Strange behavior | 0 | 10472(96.09%) | 9741(96.94%) | | 553(83.79%) | | |
| 1 | 391(3.59%) | 285(2.84%) | | 97(14.70%) | | |
| 2 | 34(0.32% | 22(0.22%) | | 10(1.16%) | | |
| 85- strange ideas | 0 | 10313(94.63% | 9593(95.47%) | | 545(82.58%) | | |
|  | 1 | 559(5.13%) | 440(4.38%) | | 106(16.06%) | | |
|  | 2 | 25(0.23%) | 15(0.15%) | | 9(1.36%) | | |
| 112- worries | 0 | 7434(68.21%) | 7060(70.26%) | | 244(36.97%) | | |
|  | 1 | 3009(27.61%) | 2666(26.53%) | | 293(44.39%) | | |
|  | 2 | 454(4.17%) | 322(3.20%) | | 123(18.64%) | | |
| OCS score >0 |  | 5764(52.89%) | 5085(50.62%) | | 574(86.97%) | | |
| OCS score >1 |  | 3330(30.56%) | 2781(27.68%) | | 476(72.12%) | | |
| OCS score 5 |  | 621(5.70%) | 401(3.99%) | | 206(31.21) | | |
| CBCL OCS sum |  | 1.25 | 1.10 | | 3.50 | | |
| CBCL OCS t-score |  | 51.87 | 51.64 | | 55.24 | | |

**Comparison parent vs child reports (CBCL):**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Parent | | | Child | | |
|  | Full Sample | OCD absent | OCD present | Full Sample | OCD absent | OCD Present |
| Attention | 53.52(5.65) | 53.23(5.34 | 57.92(7.95) | 56.20(6.95) | 56.06(6.89) | 58.26(7.50) |
| Internal | 47.66(10.52) | 47.01(10.19) | 57.62(10.44) | 53.41(5.31) | 53.27(5.30) | 55.48(6.63) |
| External | 44.38(9.83) | 43.92(9.578) | 51.29(10.91) | 52.10(4.27) | 52.03(4.19) | 53.05(5.29) |
| Total problem score | 44.64(11.41) | 43.92(11.11) | 55.60(10.26) | 53.70(5.64) | 53.57(5.53) | 55.87(6.83) |

Study Design

The Adolescent Brain and Cognitive Development (ABCD) Study is a decade-long investigation in the US, tracking children from ages 9-10 through late adolescence and early adulthood. This study conducts annual lab-based evaluations and biannual imaging scans to assess various mental and physical health metrics (Saragosa-Harris et al., 2022; Barch et al., 2018). The ABCD Study is designed to enhance our understanding of the behavioral, genetic, neurobiological, and environmental factors influencing health and risk factors for physical and mental health issues. It includes 12,000 children at baseline, recruited from 21 research sites across the United States (Karcher & Barch, 2021). The study contains neuroimaging, cognitive assessments, psychosocial surveys, and hormonal measurements. To ensure the cohort is diverse and representative, the ABCD Study employs a multi-stage probability sampling technique, along with weighting methods and stratified sampling within specific regions to minimize selection bias.

See below for list of used questionnaires:

|  |  |  |
| --- | --- | --- |
| **Mental Health Assessment** | | |
| Construct | Measure | Citations |
| ***Parent about Youth/Family*** | | |
| Categorical Psychopathology and Suicide/ Homicidally | Kiddie Schedule for Affective Disorders and Schizophrenia (KSADS-5) | (Kaufman & Birmaher, 2013; K. A. Kobak et al., 2013; K. Kobak & Kaufman, 2015) |
| Dimensional Psychopathology/Adaptive Function | Achenbach Child Behavior Check List | (Achenbach, 2009) |
| History of Mental Health and Substance Abuse Services | Introduction to Kiddie Schedule for Affective Disorder and Schizophrenia | (K. Kobak & Kaufman, 2015) |

|  |  |  |
| --- | --- | --- |
| **Demographic Assessment** | | |
| Construct | Measure | Citations |
| ***Parent about Youth/Self/Family*** | | |
| Parent/Guardian Age, Birth Sex, Gender Identity, Race, and Ethnicity | PhenX | (Stover et al., 2010) |
| Child Age, Birth Sex, Gender Identity, Race, and Ethnicity | PhenX | (Stover et al., 2010) |
| Country of Origin for Grandparents, Parent/Guardian and Child | PhenX | (Stover et al., 2010) |
| Parent/Guardian Education, Occupation and Current Income | PhenX | (Stover et al., 2010) |
| Family Income | PhenX | (Stover et al., 2010) |
| School performance, repeating a grade, detention/suspensions and a drop in grades, special services | Introduction to Kiddie Schedule for Affective Disorder and Schizophrenia | (K. A. Kobak et al., 2013) |
| Bullying and youth friendships | Introduction to Kiddie Schedule for Affective Disorder and Schizophrenia | (K. A. Kobak et al., 2013) |
| ***Youth about Self*** | | |
| Repeating a grade, detention/suspensions and a drop in grades | Introduction to Kiddie Schedule for Affective Disorder and Schizophrenia | (K. A. Kobak et al., 2013) |
| Friendships | # of same and different gender friends | NA |

**References:**

Achenbach, T. M. (2001). Manual for the ASEBA school-age forms & profiles: Child behavior checklist for ages 6-18, teacher’s report form, youth self-report: An integrated system of multi-informant assessment. ASEBA.

Achenbach, T. M. (2006). As Others See Us: Clinical and Research Implications of Cross-Informant Correlations for Psychopathology. Curr Dir Psychol Sci, 15(2), 94–98. https://doi.org/10.1111/j.0963-7214.2006.00414.x

Achenbach, T. M. (2009). The Achenbach system of empirically based assessment (ASEBA): Development, findings, theory, and applications. University of Vermont, Research Center for Children, Youth, & Families.

Barrett, M. L., Berney, T. P., Bhate, S., Famuyiwa, O. O., Fundudis, T., Kolvin, I., & Tyrer, S. (1991). Diagnosing Childhood Depression. Who Should be Interviewed—Parent or Child?: The Newcastle Child Depression Project. The British Journal of Psychiatry, 159(S11), 22–27. https://doi.org/10.1192/S0007125000292118

Bauducco, S., Gardner, L. A., Smout, S., Champion, K. E., Chapman, C., Gamble, A., Teesson, M., Gradisar, M., & Newton, N. C. (2024). Adolescents’ trajectories of depression and anxiety symptoms prior to and during the COVID-19 pandemic and their association with healthy sleep patterns. Scientific Reports, 14, 10764. https://doi.org/10.1038/s41598-024-60974-y

Beesdo, K., Knappe, S., & Pine, D. S. (2009). Anxiety and Anxiety Disorders in Children and Adolescents: Developmental Issues and Implications for DSM-V. The Psychiatric Clinics of North America, 32(3), 483. https://doi.org/10.1016/j.psc.2009.06.002

de Mathis, M. A., Diniz, J. B., Hounie, A. G., Shavitt, R. G., Fossaluza, V., Ferrão, Y., Leckman, J. F., de Bragança Pereira, C., do Rosario, M. C., & Miguel, E. C. (2013). Trajectory in obsessive-compulsive disorder comorbidities. Eur Neuropsychopharmacol, 23(7), 594–601. https://doi.org/10.1016/j.euroneuro.2012.08.006

Eiser, C., & Morse, R. (2001). Can Parents Rate Their Child’s Health-Related Quality of Life? Results of a Systematic Review. Qual Life Res, 10(4), 347–357. https://doi.org/10.1023/A:1012253723272

Guzick, A. G., Cooke, D. L., McNamara, J. P. H., Reid, A. M., Graziano, P. A., Lewin, A. B., Murphy, T. K., Goodman, W. K., Storch, E. A., & Geffken, G. R. (2019). Parents’ Perceptions of Internalizing and Externalizing Features in Childhood OCD. Child Psychiatry Hum Dev, 50(4), 692–701. https://doi.org/10.1007/s10578-019-00873-w

Karno, M., Golding, J. M., Sorenson, S. B., & Burnam, M. A. (1988). The Epidemiology of Obsessive-Compulsive Disorder in Five US Communities. Arch Gen Psychiatry, 45(12), 1094–1099. https://doi.org/10.1001/archpsyc.1988.01800360042006

Kaufman, J., & Birmaher, B. (2013). KSADS-PL. Yale University.

Kessler, R. C., Ormel, J., Petukhova, M., McLaughlin, K. A., Green, J. G., Russo, L. J., Stein, D. J., Zaslavsky, A. M., Aguilar-Gaxiola, S., Alonso, J., Andrade, L., Benjet, C., de Girolamo, G., de Graaf, R., Demyttenaere, K., Fayyad, J., Haro, J. M., Hu, C. yi, Karam, A., … Üstün, T. B. (2011). Development of Lifetime Comorbidity in the World Health Organization World Mental Health Surveys. Arch Gen Psychiatry, 68(1), 90–100. https://doi.org/10.1001/archgenpsychiatry.2010.180

Kobak, K. A., Kratochvil, C., Stanger, C., & Kaufman, J. (2013). Computerized screening of comorbidity in adolescents with substance or psychiatric disorders. Anxiety Disorders and Depression.(La Jolaa, CA).

Kobak, K., & Kaufman, J. (2015). Ksads-comp. Center for Telepsychology, Madison, WI.

Martin, J. L., Ford, C. B., Dyer-Friedman, J., Tang, J., & Huffman, L. C. (2004). Patterns of agreement between parent and child ratings of emotional and behavioral problems in an outpatient clinical setting: When children endorse more problems. J Dev Behav Pediatr, 25(3), 150–155. https://doi.org/10.1097/00004703-200406000-00002

Silverman, W. K., & Eisen, A. R. (1992). Age Differences in the Reliability of Parent and Child Reports of Child Anxious Symptomatology Using a Structured Interview. Journal of the American Academy of Child & Adolescent Psychiatry, 31(1), 117–124. https://doi.org/10.1097/00004583-199201000-00018

Slade, T., & Watson, D. (2006). The structure of common DSM-IV and ICD-10 mental disorders in the Australian general population. Psychol. Med, 36(11), 1593–1600. https://doi.org/10.1017/S0033291706008452

Stover, P. J., Harlan, W. R., Hammond, J. A., Hendershot, T., & Hamilton, C. M. (2010). PhenX: a toolkit for interdisciplinary genetics research. Current Opinion in Lipidology, 21(2), 136–140.