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Problematic substance use in depressed adolescents: Prevalence and clinical correlates

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ABSTRACT

Background: Substance use among adolescents is common and associated with significant consequences, including depression. Adolescents can experience myriad problems related to early onset substance use and depression, making further understanding of this comorbidity necessary.
Method: Participants were a subset from a large-scale performance improvement project and consisted of adolescents aged 12–18 who screened positive for depression during their routine medical or psychiatric appointment and who then completed the substance use assessment Car, Relax, Alone, Forget, Friends, Trouble Version 2.1 (CRAFFT). Participants with problematic substance use had a CRAFFT score $\geq$2.
Results: A total of 621 participants were included in this study, and 105 (16.9%) reported problematic substance use. Compared with participants without problematic substance use, those with problematic use were more likely to have moderate to severe depression and anxiety, as well as significantly higher irritability, impulsivity, suicidal propensity, and suicidal thoughts scores. Controlling for age at screening, sex, race, and ethnicity, problematic substance use remained a significant predictor of depression severity, impulsivity, suicidal propensity, and suicidal thoughts.
Limitations: Participants were from a large, metropolitan area of the Southwest United States who must have screened positive for depression, so results may not generalize. Because all participants were underage, they may have been wary in responding to the substance use assessment accurately.
Conclusions: By using a large, diverse sample in a real-world clinical setting, findings strengthen the association between problematic substance use and depression and depression-associated symptoms among adolescents, highlighting the need for early detection and universal depression screening.

1. Introduction

Substance use during adolescence is particularly problematic as it is associated with significant consequences, such as the development of problematic patterns of substance use, development of a substance use disorder and other psychiatric disorders (e.g., depression, anxiety, conduct disorder), as well as alterations to brain development in regions that control higher order cognitive functioning and inhibitory control (Clayborne et al., 2019; Esmaeelzadeh et al., 2018; Fergusson et al., 2009; Gray & Squeglia, 2018; McHugh & Weiss, 2019; Pedrelli et al., 2016; Spear, 2018). Though short-term and long-term consequences of early onset substance use are well known, rates of drug and alcohol use in this population are high (Substance Abuse and Mental Health Services Administration, 2021). In 2020, approximately 20.9 % of adolescents aged 12–17 reported ever using illicit drugs (13.8 % in the past year), and 22.8 % reported ever consuming alcohol (18.5 % in the past year) (Substance Abuse and Mental Health Services Administration, 2021).

One condition that is often comorbid with substance use that has garnered attention is depression (Esmaeelzadeh et al., 2018; Fergusson et al., 2009; Pedrelli et al., 2016). Rates of major depressive episodes in adolescents have been steadily increasing, with 17 % of adolescents aged 12–17 reporting that they experienced a major depressive episode

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in the past year (Substance Abuse and Mental Health Services Administration, 2021). This rate is especially problematic as these adolescents were more likely to also use substances compared with those without depression, including illicit drugs (28.6 % vs. 10.7 %), marijuana (22.0 % vs. 7.9 %), as well as binge drinking alcohol (6.2 % vs. 3.8 %). With the brain still developing during adolescence, this is a particularly vulnerable period for the onset of substance use and depressive symptomatology, which makes identifying those at risk crucial.

Taken together, comorbid substance use and depression among adolescents is well documented, and evidence suggests poor outcomes for those with this comorbidity (Gray & Squeglia, 2018; McHugh & Weiss, 2019; Vida et al., 2009). Indeed, those with this comorbidity are more likely to drink more (Wu et al., 2008), develop and/or maintain a substance use disorder into adulthood (Meier et al., 2016), not complete high school, get arrested by age 19 (Vida et al., 2009), and experience more severe symptoms of the two conditions (McHugh & Weiss, 2019; Vida et al., 2009). With persistent symptoms and consequences of depression and substance use, individuals with this comorbidity are at risk for a poorer prognosis both during adolescence and into adulthood.

Because of the significant comorbidity of substance use and depression among adolescents (Esmaeelzadeh et al., 2018; Fergusson et al., 2009; Pedrelli et al., 2016), these remain clinical conditions of interest. With the extant literature having been established largely in research or survey settings, using data collected as part of routine clinical care in a clinical setting would provide valuable information regarding the prevalence and severity of problematic substance use and comorbid depression. This would then help inform the current needs for identifying and treating adolescents with this comorbidity. To address this identified gap, the current study examined the clinical correlates of problematic substance use among adolescents who screened positive for depression during routine primary care appointments.

2. Method

2.1. Participants and procedure

Participants were patients of a health system in a large, metropolitan city in the Southwest United States undergoing a large-scale performance improvement project. VitalSign6 is an ongoing project examining a Primary Care First (PCP-First) Model utilizing a universal screening and measurement-based care approach to screen for depression and provide treatment in large, clinical samples (Trivedi et al., 2019). Overall, the VitalSign6 project highlights the need to utilize primary care clinics in the detection and management of depression to ease healthcare burden and reduce time from detection to treatment. Data for the current paper were drawn from VitalSign6 in order to examine the cross-sectional association among substance use and mental health.

Universal screening via VitalSign6 occurred during routine visits to primary and psychiatric care clinics participating in the performance improvement project. Patients with a positive screen for depression were asked to complete additional assessments. The medical clinicians, who had been trained by the VitalSign6 project, then completed a clinical interview and made a diagnosis. Clinicians were also responsible for starting treatment and monitoring clinical status over time. Prior to initiation, this study was approved by the University of Texas Southwestern Medical Center Institutional Review Board, who classified this project as a performance improvement project and waived the requirement to obtain informed consent. The participants included in this study were a subset of the total VitalSign6 population and consisted of adolescents aged 12–18 who screened positive on the 2-item Patient Health Questionnaire (PHQ-2) screening measure for depression (PHQ-2 > 2), which included depressed/irritable mood and anhedonia, and who then completed the substance use assessment (CRAFFT, detailed below). All study data was collected between 06/2018 and 07/2022.

2.2. Measures

Car, Relax, Alone, Forget, Friends, Trouble (CRAFFT) version 2.1 (Knight et al., 1999) is a 9-item, self-report screening measure that assesses substance use and related consequences in adolescents. It consists of three prescreening items assessing any substance use over the past year (i.e., alcohol, marijuana, and other substances) and six items measuring risks and consequences related to substance use. These six yes/no items are used to determine the total score (0–6). The CRAFFT has demonstrated good predictive validity and internal consistency (Knight et al., 1999, 2002). A cut-off point of 2 has been established to accurately predict problematic substance use and the presence of a substance use disorder per DSM-5 criteria (Mitchell et al., 2014). As such, the current study categorized problematic substance use as a score of 2 or higher, and no problematic substance use as a score of 0–1. The internal consistency for the scale in the current sample was good ($\alpha = 0.90$).

Patient Health Questionnaire (PHQ-9) (Kroenke et al., 2001) is a 9-item, self-report assessment for depression. Depression symptoms are scored based on frequency over the past two weeks from 0 (not at all) to 3 (nearly every day) with a possible score between 0 and 27. Severity of depression was categorized as none (0–5), mild (6–9), moderate (10–14), severe (15–19), and very severe (20–27). The two items on the PHQ-2, which are taken from the PHQ-9, were used as the initial screening measure to determine inclusion in this study (PHQ-2 > 2) with a possible score between 0 and 6. The internal consistency for the scale in the current sample was acceptable ($\alpha = 0.77$).

Generalized Anxiety Disorder scale (GAD-7) (Spitzer et al., 2006) is a 7-item, self-report assessment for generalized anxiety disorder. It assesses anxiety symptoms over the past two weeks using the scale from 0 (not at all) to 3 (nearly every day) with a possible score between 0 and 21. Severity of anxiety was classified as none (0–4), mild (5–9), moderate (10–14), and severe (15–21). The internal consistency for the scale in the current sample was good ($\alpha = 0.88$).

Concise Associated Symptoms Tracking Scale (CAST) (Trivedi, Wisniewski, Morris, Fava, Kurian, et al., 2011) is a 16-item, self-report assessment of depression-associated symptoms. The CAST assesses symptoms from the past 24 h using a 5-point, Likert-type scale from strongly disagree to strongly agree. Items are scored on a scale from 1 to 5. It includes five factors, and the internal consistency for the subscales in the current sample was generally good: irritability (5 items; $\alpha = 0.85$), anxiety (3 items; $\alpha = 0.78$), insomnia (2 items; $\alpha = 0.86$), mania (4 items; $\alpha = 0.71$), and panic (2 items; $\alpha = 0.69$).

Concise Health Risk Tracking Scale (CHRT) (Trivedi, Wisniewski, Morris, Fava, Gollan, et al., 2011) is a 14-item, self-report assessment of suicide risk. Symptoms are assessed over the past 24 h using a 5-point, Likert-type scale from strongly disagree to strongly agree. Items are scored on a scale from 0 to 4. It includes three factors, and the internal consistency for the subscales in the current sample was good: impulsivity (2 items; $\alpha = 0.80$), suicidal propensity (9 items; $\alpha = 0.92$), and suicidal thoughts (3 items; $\alpha = 0.86$). The propensity factor consists of four domains: pessimism, helplessness, perceived lack of social support, and despair.

2.3. Statistical analysis

Adolescents who completed the CRAFFT at the screening visit ($N = 621$) were categorized as participants without (CRAFFT score <2) and with (CRAFFT score ≥2) problematic substance use. Bivariate analyses comparing screening demographic and clinical features in those with versus without problematic use were conducted using two-tailed *t*-tests for continuous variables and chi-square tests for categorical variables. The significant findings from the bivariate analyses were then tested using separate linear regression models controlling for age at screening, sex, race, and ethnicity. All analyses were conducted using SAS 9.4 (SAS Inc, Cary, NC).

3. Results

Of the 621 participants included in this study, 105 (16.9 %) reported problematic substance use (CRAFFT score ≥2). Table 1 displays the number and type of CRAFFT items participants endorsed. The median number of CRAFFT items reported by those with problematic substance use was 4, and the mean was 4.07 (SD = 1.42).

Table 2 presents bivariate comparisons of participants with or without problematic substance use. Participants with problematic use are more likely to be male (49.5 % with substance use vs. 31.4 % without substance use, $p < .0001$), White (73.2 % with substance use vs. 65.2 % without substance use, $p = .003$), and of Hispanic ethnicity (39.0 % with substance use vs. 20.0 % without substance use, $p < .0001$). Additionally, participants with problematic substance use are older at screening ($M_{age} = 15.8$ (SD = 1.4) with substance use vs. 13.8 (SD = 1.8) without substance use, $p < .0001$).

Clinically, a significantly higher percentage of participants with problematic substance use have moderate to severe depression (92.4 % with substance use vs. 63.4 % without substance use, $p < .0001$) and anxiety (65.6 % with substance use vs. 50.0 % without substance use, $p = .003$) (see Table 2). In addition, significantly more participants with problematic substance use have a major depressive disorder diagnosis (56.2 %) compared with the 33.3 % of the sample without problematic use ($p < .0001$). In line with this, participants with problematic substance use have significantly higher PHQ-9 total ($p < .0001$), GAD-7 total ($p < .0001$), CAST irritability ($p = .012$), CAST anxiety ($p = .009$), CHRT impulsivity ($p < .0001$), CHRT suicidal propensity ($p < .0001$), and CHRT suicidal thoughts ($p < .0001$) scores.

Multivariate analyses were then conducted to examine the effect of problematic substance use on the depression and associated symptoms that were significant in the bivariate analyses. Controlling for age at screening, sex, race, and ethnicity, problematic substance use significantly predicted depression severity (β = 1.54, 95 % Confidence Interval (CI) [0.08, 2.98], $p = .038$) (see Table 3), impulsivity (β = 1.74, 95 % CI [0.75, 2.74], $p < .001$) (see Table 4), suicidal propensity (β = 4.60, 95 % CI [1.11, 8.09], $p = .010$) (see Table 5), and suicidal thoughts (β = 1.78, 95 % CI [0.61, 2.95], $p = .003$) (see Table 6). Irritability and anxiety were not significant in multivariate models.

Table 1
CRAFFT Responses Across All Participants Aged 12–18 Years Old.

CRAFFT variables	No Problematic Use (n = 516)	Problematic Use (n = 105)	Total (N = 621)
CRAFFT Score			
0	475 (88.6 %)	0 (0.0 %)	475 (76.5 %)
1	41 (7.7 %)	0 (0.0 %)	41 (6.6 %)
2	0 (0.0 %)	20 (19.0 %)	20 (3.2 %)
3	0 (0.0 %)	20 (19.0 %)	20 (3.2 %)
4	0 (0.0 %)	19 (18.1 %)	19 (3.1 %)
5	0 (0.0 %)	25 (23.8 %)	25 (4.0 %)
6	0 (0.0 %)	21 (20.0 %)	21 (3.4 %)
CRAFFT Items			
Ridden in a car driven by someone who was “high”	16 (3.1 %)	68 (64.8 %)	84 (13.5 %)
Use alcohol or drugs to “relax”	4 (0.1 %)	92 (87.6 %)	96 (15.5 %)
Ever forget things you did while using alcohol or drugs	0 (0.0 %)	48 (45.7 %)	48 (7.7 %)
Ever use alcohol or drugs alone	21 (4.1 %)	54 (51.4 %)	75 (12.1 %)
Have family or friends ever tell you to cut down on your drinking	0 (0.0 %)	85 (80.9 %)	85 (13.7 %)
Ever gotten in trouble while using alcohol or drugs	0 (0.0 %)	80 (76.2 %)	80 (12.9 %)

4. Discussion

In this large sample of adolescents who were receiving care at primary care and psychiatric clinics, the presence of problematic substance use was associated with significantly greater severity of depression and depression-associated symptoms. Although this sample all screened positive for depression at routine medical appointments, the rates of substance use were similar to what is reported in recent epidemiological literature. This study thus provides unique insight into the clinically significant prevalence and overlap in problematic substance use and depression in a diverse sample of adolescents.

Overall, 16.9 % of participants aged 12–18 reported problematic substance use, consistent with recent large-scale survey data (Substance Abuse and Mental Health Services Administration. (2021), 2021). Among those with problematic substance use, more than half received a major depressive disorder diagnosis compared with one third of those without problematic use. In addition, those with problematic substance use had greater depression-associated symptoms, including anxiety, irritability, impulsivity, suicidal propensity, and suicidal thoughts. After controlling for demographic characteristics, problematic substance use remained a significant predictor of depression severity, impulsivity, suicidal propensity, and suicidal thoughts. Despite the gravity of this, rates of adolescent substance use remain high, underscoring a predisposition to early onset drug and alcohol use (Gray & Squeglia, 2018; O’Loughlin et al., 2017; Pedrelli et al., 2016; Schuler et al., 2019; Trucco, 2020; Van Ryzin et al., 2012).

Cross-sectional findings demonstrate a clear association among problematic substance use and depression, as do longitudinal studies. There remains support for the self-medication model (Turner et al., 2018; Wilkinson et al., 2016), and there are also some longitudinal studies that have found support for a contrasting model suggesting that using substances in adolescence increases the likelihood of later developing a depressive disorder (Esmaeelzadeh et al., 2018; Fergusson et al., 2009; Lev-Ran et al., 2014; Wilkinson et al., 2016). Suicidality, one symptom of depression, has also been shown to be significantly associated with problematic substance use (Bjureberg et al., 2022; Guvendeger Doksat et al., 2017; Vijayakumar et al., 2011). Research has found unidirectional relationships from substance use to suicidality and from suicidality to substance use (Zhang & Wu, 2014), suggesting a complex relationship between the two factors, much like that seen with comorbid substance use and depression. In total, a feedback loop then develops and after this begins, there arises a cyclical pattern of symptoms and consequences that can persist and worsen if left untreated.

Early identification of adolescents at risk for developing problematic substance use and depression is, therefore, essential. Indeed, current findings indicate that adolescents with problematic drug and alcohol use in the past year who screened positive for depression in the past two weeks were on average two years older than those without problematic use. As such, screening for depression and substance use early and then providing appropriate treatment may help prevent the development and/or worsening of problematic substance use and depression during a critically important period for brain development, thus producing the best clinical outcomes for these individuals.

Future research could examine the effect first-line screening for problematic substance use in combination with depression has on improving outcomes. Identifying those with problematic substance use early, irrespective of their depression status, can serve to prevent the negative consequences seen with early onsets substance use. To provide additional valuable information, future studies should examine the longitudinal framework of the best methods and time to assess and intervene for both those with problematic substance use alone and those

Table 2
Demographic and Clinical Comparisons by Problematic Substance Use.

Participant Characteristics	No Problematic Use (n = 516) n (%) or M (SD)	Problematic Use (n = 105) n (%) or M (SD)	Total (N = 621) n (%) or M (SD)	Test Statistic	*p* value	Cohen's *d*
Sex				**12.7**	**0.0004**	
Female	354 (68.6 %)	53 (50.5 %)	407 (65.5 %)			
Male	162 (31.4 %)	52 (49.5 %)	214 (34.5 %)			**0.38**
Race*				**14**	**0.003**	
Black	42 (11.9 %)	17 (20.7 %)	59 (9.5 %)			
White	230 (65.2 %)	60 (73.2 %)	290 (46.7 %)			**0.17**
Other	80 (22.6 %)	5 (6.1 %)	85 (13.7 %)			
Unknown	1 (0.3 %)	0 (0 %)	1 (0.2 %)			
Ethnicity				**24.5**	**<0.0001**	
Hispanic	103 (20.0 %)	41 (39.0 %)	144 (23.2 %)			**0.43**
Non-Hispanic	268 (51.9 %)	53 (50.5 %)	321 (51.7 %)			
Unknown	145 (28.1 %)	11 (10.5 %)	156 (25.1 %)			
Age at Screening	13.8 (1.8)	15.8 (1.4)	14.1 (1.9)	**12.9**	**<0.0001**	**1.25**
PHQ-9 Total	12.1 (5.6)	15.3 (4.7)	12.6 (5.6)	**5.5**	**<0.0001**	**0.62**
PHQ-9 Categories				**38.5**	**<0.0001**	
None (0–5)	75 (14.5 %)	3 (2.9 %)	78 (12.6 %)			
Mild (6–9)	114 (22.1 %)	5 (4.8 %)	119 (19.2 %)			
Moderate (10–14)	141 (27.3 %)	40 (38.1 %)	181 (29.1 %)			
Severe (15–19)	138 (26.7 %)	35 (33.3 %)	173 (27.9 %)			
Very Severe (20+)	48 (9.3 %)	22 (21.0 %)	70 (11.3 %)			
GAD-7 Total*	9.4 (6.0)	12.1 (5.2)	9.8 (6.0)	**4.1**	**<0.0001**	**0.47**
GAD-7 Categories*				**13.6**	**0.003**	
None (0–4)	129 (25.1 %)	9 (9.1 %)	138 (22.2 %)			
Mild (5–9)	130 (25.3 %)	25 (25.3 %)	155 (25.0 %)			
Moderate (10–14)	129 (25.2 %)	33 (33.3 %)	162 (26.1 %)			
Severe (15+)	125 (24.4 %)	32 (32.3 %)	157 (25.3 %)			
CAST Irritability*	9.4 (5.4)	12.6 (3.7)	9.6 (5.4)	**2.5**	**0.012**	**0.67**
CAST Anxiety*	5.2 (3.3)	7.2 (2.6)	5.3 (3.3)	**2.6**	**0.009**	**0.67**
CAST Insomnia*	3.3 (2.7)	3.8 (2.6)	3.3 (2.7)	0.8	0.435	0.18
CAST Mania*	6.9 (3.4)	7.2 (3.5)	6.9 (3.4)	0.4	0.719	0.08
CAST Panic*	2.2 (2.0)	3.1 (1.7)	2.2 (2.0)	1.9	0.058	0.47
CHRT Impulsivity*	4.1 (2.6)	5.9 (1.9)	4.3 (2.6)	**5.6**	**<0.0001**	**0.77**
CHRT Propensity*	13.4 (9.2)	19.6 (7.4)	14.2 (9.2)	**4.5**	**<0.0001**	**0.74**
CHRT Thoughts*	2.7 (3.0)	4.4 (2.9)	2.9 (3.0)	**3.6**	**0.0004**	**0.56**
Diagnosis				**32.1**	**<0.0001**	
Adjustment Disorder	33 (6.4 %)	2 (1.9 %)	35 (5.6 %)			
Dysthymia	13 (2.5 %)	0 (0.0 %)	13 (2.1 %)			
Major Depressive Disorder	172 (33.3 %)	59 (56.2 %)	231 (37.2 %)			
Unspecified Depressive Disorder	55 (10.7 %)	14 (13.3 %)	69 (11.1 %)			
Other Psychiatric Dx	60 (11.6 %)	14 (13.3 %)	74 (11.9 %)			
No Psychiatric Dx	38 (7.4 %)	0 (0.0 %)	38 (6.1 %)			
Unknown/Unable to Confirm	145 (28.1 %)	16 (15.2 %)	161 (25.9 %)			

* For Race, n = 353 for no problematic use group and n = 82 for problematic use group. For GAD-7 total, n = 513 in no problematic use group and n = 99 in the problematic use group; For CAST domain scores, n = 305 in no problematic use group and n = 20 in the problematic use group; For CHRT domain scores, n = 328 in no problematic use group and n = 48 in the problematic use group. Bold denotes statistically significant group differences.

Table 3
Effect of Problematic Substance Use on Depression Severity.

Variable	β estimate	95 % Confidence Interval	*p* value
Intercept	2.06	−2.12, 6.26	0.334
Age	0.75	0.46, 1.04	**<0.0001**
Female Sex	1.78	0.71, 2.85	**0.001**
White	0.34	−0.96, 1.63	0.608
Black	−1.13	−2.93, 0.66	0.216
Hispanic	1.34	0.20, 2.50	**0.022**
Problematic Use	1.54	0.08, 2.98	**0.038**

Table 4
Effect of Problematic Substance Use on Impulsivity.

Variable	β estimate	95 % Confidence Interval	*p* value
Intercept	2.07	−0.44, 4.58	0.106
Age	0.11	−0.06, 0.29	0.194
Female Sex	0.31	−0.37, 0.98	0.370
White	0.17	−0.61, 0.96	0.668
Black	−0.24	−1.31, 0.83	0.661
Hispanic	0.14	−0.57, 0.85	0.705
Problematic Use	1.74	0.75, 2.74	**<0.001**

Table 5
Effect of Problematic Substance Use on Suicidal Propensity.

Variable	β estimate	95 % Confidence Interval	*p* value
Intercept	−1.73	−10.54, 7.08	0.700
Age	0.93	0.32, 1.54	**0.003**
Female Sex	2.74	0.38, 5.09	**0.023**
White	0.59	−2.17, 3.35	0.676
Black	−2.30	−6.07, 1.47	0.230
Hispanic	2.63	0.13, 5.13	**0.039**
Problematic Use	4.60	1.11, 8.09	**0.010**

Table 6
Effect of Problematic Substance Use on Suicidal Thoughts.

Variable	β estimate	95 % Confidence Interval	*p* value
Intercept	1.12	−1.84, 4.08	0.456
Age	0.09	−0.12, 0.29	0.393
Female Sex	0.59	−0.20, 1.39	0.141
White	−0.30	−1.22, 0.63	0.526
Black	−0.46	−1.73, 0.80	0.473
Hispanic	1.02	0.18, 1.86	**0.012**
Problematic Use	1.78	0.61, 2.95	**0.003**

with comorbid problematic substance use and depression.

There are several caveats worth mentioning. This was a cross-sectional study that used a sample of adolescents drawn from a large, metropolitan region of the Southwest United States who all had to screen positive for depression to be included in this study, both of which may impact the generalizability of these findings. All assessments were self-report, and because all participants were underage, there may have been caution taken in responding on the CRAFFT. As this study examined the existing comorbidity of problematic substance use and depression, causality cannot be determined. As the purpose of this study was to explore the correlates of problematic substance use in a sample of depressed adolescents, and not to test specific hypotheses, we did not adjust p-values for multiple comparisons.

This study used a clinical setting to validate the range of depression and associated symptoms observed in adolescents with problematic substance use. Given the severity and breadth of consequences associated with this comorbidity, findings highlight the importance and utility of universal screening for depression in primary care clinics. Because one in five adolescents use substances and one in five experience depression, examining treatment outcomes in a clinical setting for those with this comorbidity is the next step.

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CRediT authorship contribution statement

Elise N. Marino: Conceptualization, Writing – original draft. **Manish K. Jha:** Conceptualization, Writing – review & editing. **Abu Minhajuddin:** Data curation, Formal analysis, Validation. **Emine Rabia Ayvaci:** . **Sara Levinson:** Investigation, Writing – review & editing. **Ronny Pipes:** Investigation, Writing – review & editing. **Graham J. Emslie:** Investigation, Writing – review & editing. **Madhukar H. Trivedi:** Conceptualization, Funding acquisition, Project administration, Supervision, Writing – review & editing.

Declaration of competing interest

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Data availability

The authors do not have permission to share data.

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