



The influence of borderline personality traits on clinical outcomes in bipolar disorder

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Abstract

Objectives: Systematic reviews suggest comorbid borderline personality disorder is present in approximately 20% of individuals who have bipolar disorder, but current diagnostic systems demonstrate a move towards dimensional rather than categorical approaches to classifying personality pathology. We aimed to examine the presence and severity of borderline personality traits in bipolar I and bipolar II disorder, and to explore associations between the presence/severity of borderline personality traits and clinical outcomes in bipolar disorder.

Methods: Borderline personality traits were measured in 1447 individuals with DSM-IV bipolar disorder (1008 bipolar I disorder and 439 bipolar II disorder) using the Borderline Evaluation of Severity over Time (BEST) questionnaire. Lifetime clinical outcomes were assessed via Schedules for Clinical Assessment in Neuropsychiatry (SCAN) semi-structured interview and clinical case notes.

Results: Borderline personality traits were common in both bipolar disorder groups, with 86.2% participants reporting at least one trait. These included traits that overlap with (eg mood instability) and those that are distinct from the symptoms of bipolar disorder (eg fear of abandonment). Borderline personality traits were significantly more frequent and more severe in bipolar II disorder compared to bipolar I disorder. More severe borderline traits, and even the presence of a single borderline personality trait, were significantly associated with younger age of bipolar disorder onset and higher prevalence of lifetime alcohol misuse in both bipolar disorder groups.

Conclusions: The presence of comorbid borderline personality traits should be considered in the management of all patients with bipolar disorder irrespective of whether criteria for a categorical borderline personality disorder diagnosis are met.

KEYWORDS

age of onset, alcohol dependence, bipolar disorder, borderline personality disorder

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1 | INTRODUCTION

Bipolar disorder is a common psychiatric disorder that affects at least 1% of the population.¹ It has one of the highest mortality rates of any psychiatric disorder. Suicide accounts for nearly 20% of all deaths in those with bipolar disorder and between 25% and 50% will attempt suicide.² Even with treatment around one in three patients will experience a depressive or manic relapse within a year.^{3,4} Borderline personality disorder is a pervasive disorder which shares some symptom similarities with bipolar disorder.⁵ Despite these similarities in presentation, there is evidence which suggests that the two disorders have different aetiologies,⁶ distinct neuropsychological processes^{7,8} and different prognoses.⁹ However, the two disorders are commonly comorbid. Estimates of the degree of comorbidity vary from as low as 4%¹⁰ to as high as 50%¹¹ but sample sizes are often very small. Systematic reviews suggest comorbid borderline personality disorder is present in approximately 20% of individuals who have bipolar disorder, with higher rates in bipolar II disorder compared with bipolar I disorder.^{12,13,14} By contrast data from the large National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) in the USA found a significantly higher rate of comorbid borderline personality disorder in bipolar I disorder compared to bipolar II disorder,¹⁵ and the presence of comorbid borderline personality disorder was associated with earlier age of illness onset, greater number of mood episodes and higher rate of alcohol misuse.¹⁵

The diagnosis of borderline personality disorder is a categorical one made if five or more of nine possible personality traits are present,¹⁶ however, many authors have noted that a categorical system may not be optimal for diagnosing personality disorder.¹⁷ Personality pathology can also be characterised dimensionally as a continuum, and the majority of the individual diagnostic criteria have been shown to be continuously distributed.¹⁸ The move towards dimensional as opposed to categorical approaches to personality disorder classification is reflected in the hybrid dimensional-categorical model included for further study in DSM-5¹⁶ and the dimensional approach taken in ICD-11.¹⁹ The impact of borderline personality traits (as opposed to formal diagnosis) on clinical outcomes in bipolar disorder is unknown. We sought to explore the presence, severity and impact of borderline personality traits in a large cohort of individuals who have bipolar disorder.

1.1 | Aims of the study

1. To compare the presence and severity of borderline personality traits in DSM-IV bipolar I and bipolar II disorder.
2. To explore the impact of the presence and severity of borderline personality traits on clinical outcomes in DSM-IV bipolar disorder.

2 | PATIENTS AND METHODS

2.1 | Sample

The study was part of an ongoing programme of research into the genetic and non-genetic determinants of bipolar disorder and related mood disorders (Bipolar Disorder Research Network, BDRN; www.bdrn.org). Participants were recruited throughout the UK via systematic and non-systematic recruitment methods. Systematic recruitment involved screening for potential participants through the UK National Health Service (NHS) Community Mental Health Teams and lithium clinics. Non-systematic recruitment involved advertisements for volunteers on the research team website, in local and national media and through the patient support organisation Bipolar UK (www.bipolaruk.org). The research programme inclusion criteria required participants to be aged 18 years or over, UK White ethnicity due to a focus on genetic aetiology, able to provide written informed consent, meet DSM-IV criteria for bipolar disorder and for mood symptoms to have started before the age of 65 years. Individuals were excluded from BDRN if their mood disorder was a consequence of alcohol or substance dependence, secondary to a medical illness or medication, or if they were biologically related to another study participant.

All procedures were approved by the West Midlands NHS Research Ethics Committee (MREC/97/7/01) and all participating NHS Trusts and Health Boards. Written informed consent was obtained from all participants.

2.2 | Psychiatric assessment of bipolar disorder

A trained BDRN interviewer collected lifetime clinical data on participants using the semi-structured Schedules for Clinical Assessment in Neuropsychiatry (SCAN) interview.²⁰ Available psychiatric case notes were used to corroborate and supplement interview data, with best-estimate main lifetime DSM-IV diagnosis²¹ and lifetime clinical ratings (such as age of illness onset and number of episodes of illness) derived from all clinical data available. If there was any doubt about the diagnosis or ratings, at least two members of the research team, each blind to the others' ratings produced the diagnostic and clinical ratings and consensus was reached. Inter-rater reliability was high. Mean kappa statistics were 0.85 for DSM-IV diagnosis and ranged between 0.81 and 0.99 for other key clinical categorical variables. Mean intra-class correlation coefficients were between 0.91 and 0.97 for key clinical continuous variables. Team members involved in the interview, rating and diagnostic procedures were all trained research psychologists or psychiatrists.

The study reported here was carried out on a subset of the sample with a best-estimate main lifetime DSM-IV diagnosis of bipolar I disorder (N = 1008) or bipolar II disorder (N = 439) who were assessed for the presence/severity of borderline personality traits.

2.3 | Measurement of borderline personality traits

Borderline personality traits were measured using the self-report Borderline Evaluation of Severity over Time (BEST) questionnaire.²² The questionnaire consists of 12 items, measuring the presence and severity of borderline personality traits relating to thoughts, feelings and negative behaviours over the course of the participant's life. The traits are listed in Table 2. Each item is measured from 1 to 5, so BEST score ranges from 12 to 60. For each individual trait, we categorised scores of 1-2 (caused none/slight or mild problems) as indicating absence of the trait and scores of 3-5 (caused moderate/severe/extreme difficulty) as indicating the presence of the trait. This method of evaluating borderline personality traits has been shown to be reliable and have high internal consistency.^{22,23} At the time the BEST questionnaire was completed, participants' current mood state was also measured using the Beck Depression Inventory (BDI)²⁴ and the Altman Mania Scale (AMS).²⁵ The questionnaires were sent to 3710 BDRN participants who have bipolar I or II disorder in October 2013 and a reminder was sent 6 weeks later. A total of 1447 participants (39.0%) completed and returned the questionnaires.

2.4 | Statistical analysis

The data were analysed using SPSS (version 24.0). Non-parametric analysis was conducted as continuous data were non-normally distributed. Mann-Whitney U tests and chi-squared tests were used to compare continuous variables (including BEST score) and categorical variables (including presence/absence of each trait measured by the BEST) between and within the bipolar I disorder and bipolar II disorder groups. Spearman's rank correlation coefficients were calculated to examine the degree of association between continuous demographic and clinical variables (such as age of onset of bipolar disorder) and total BEST score within each group.

Binary logistic regression analyses, using a forward stepwise conditional method, were carried out to assess whether BEST score and/or the presence of each individual BEST item predicted group membership (bipolar I disorder vs bipolar II disorder), while controlling for current mood state and potential confounding demographic and clinical variables.

Multiple linear regressions, using forward stepwise method, were used to assess which lifetime clinical variables were significant predictors of BEST score while controlling for potential demographic confounders and current mood state in each of bipolar I and bipolar II disorder.

Probabilities used were two-tailed throughout, and $P < .05$ was the minimum significance for all analyses.

3 | RESULTS

3.1 | Demographics, current mood state and clinical characteristics of the sample

The bipolar II disorder group was significantly younger at participation than the bipolar I disorder group, and scored significantly higher on

the BDI (Table 1). Participants with bipolar II disorder were also significantly younger at illness onset and had more frequent illness episodes than those with bipolar I disorder, and were significantly more likely to have used cannabis regularly and misused alcohol (Table 1).

3.2 | Presence and severity of borderline personality traits in bipolar I and bipolar II disorder

In univariate analyses, BEST score was significantly higher in the bipolar II disorder group than the bipolar I disorder group (36 vs 27, Table 2). A significantly greater proportion of those with bipolar II disorder compared to bipolar I disorder were positive for the presence of all 12 individual BEST items (Table 2). 94.5% (415/439) of participants with bipolar II disorder were positive for at least one BEST item compared to 85.9% (866/1008) of those with bipolar I disorder ($P < .001$).

After adjustment for demographic (age at participation) and clinical differences between the diagnostic groups (age of onset of bipolar disorder, mean number of episodes of depression and hypomania/mania per year of illness, history of regular cannabis use and history of alcohol misuse), and for current mood state (BDI and AMS score), both higher BEST total score (OR 1.036, 95% CI 1.025 - 1.048) and the presence of nine of the twelve BEST items remained individually significantly associated with a diagnosis of bipolar II disorder (Table 2).

3.3 | Associations between clinical outcomes and borderline personality traits in bipolar I and bipolar II disorder

In both bipolar I and bipolar II disorder, higher BEST score was significantly associated with younger age of onset of bipolar disorder, greater number of episodes of hypomania/mania and depression, and history of alcohol misuse, regular cannabis use, regular other drug use and suicide attempt in univariate analyses (Table 3).

Given there was a relationship between BEST score and a number of demographic variables and current mood state (see Table 3), a separate multiple linear regression was carried out within each diagnostic group to assess which of the clinical outcomes remained associated with BEST score, after adjustment for potential demographic confounders (gender, method of recruitment, higher education and age at participation) and current mood state (BDI and AMS score). In both bipolar I and bipolar II disorder younger age of onset of bipolar disorder (*bipolar I*: B -0.143, 95% CI -0.226 - -0.061, $P = .001$; *bipolar II*: B -0.158, 95% CI -0.271 - -0.044, $P = .007$), history of alcohol misuse (*bipolar I*: B 3.683, 95% CI 2.191-5.175, $P < .001$, *bipolar II*: B 2.527, 95% CI 1.433-4.622, $P = .018$) and history of suicide attempt (*bipolar I*: B 4.500, 95% CI 3.047-5.953, $P < .001$, *bipolar II*: B 3.384, 95% CI 1.357-5.412, $P = .001$) remained significantly associated with BEST score.

We also examined the relationships between clinical outcomes and the presence of at least one borderline personality trait in each bipolar disorder group. Younger age at bipolar disorder onset (*bipolar I*: 21 vs 24 years, $P < .001$; *bipolar II* 18 vs 25 years $P < .001$),

	Bipolar I (n = 1008)	Bipolar II (n = 439)	P value
Demographics:			
Age at participation (in years) <i>median (IQR, range)</i>	49 (17, 20-83)	48 (19, 21-84)	.025
Male n (%)	291 (28.9)	130 (29.6)	.775
Married n (%)	854 (86.6)	374 (87.0)	.853
Occupation n (%)	560 (57.4)	238 (56.4)	.900
Professional	398 (40.8)	175 (41.5)	
Non-professional	18 (1.8)	9 (2.1)	
Never worked			
Higher education n (%)	456 (47.2)	201 (48.1)	.750
Systematically recruited n (%)	255 (25.6)	90 (20.9)	.059
Current mood state:			
BDI score <i>median (IQR, range)</i>	11 (15, 0-57)	16 (18, 0-57)	<.001
AMS score <i>median (IQR, range)</i>	3 (5, 0-20)	3 (5, 0-17)	.054
Lifetime clinical characteristics:			
Age of bipolar disorder onset (in years) <i>median (IQR, range)</i>	21 (12, 7-64)	19 (11, 5-63)	<.001
Mean number of episodes of depression per year of illness <i>median (IQR, range)</i>	0.33 (0.48, 0.00-8.25)	0.56 (0.79, 0.06-12.53)	<.001
Mean number of episodes of hypomania/mania per year of illness <i>median (IQR, range)</i>	0.28 (0.36, 0.02-4.35)	0.37 (0.65, 0.02-12.53)	<.001
History of regular cannabis use n (%)	161 (16.5)	95 (22.2)	.010
History of regular other drug use n (%)	121 (12.5)	53 (12.4)	.970
History of alcohol misuse n (%)	365 (38.3)	189 (45.3)	.015

Note: Totals vary due to unknown/missing data.

Abbreviations: AMS, Altman Mania Scale; BDI, Beck Depression Inventory; IQR, interquartile range.

history of alcohol misuse (*bipolar I*: 40.8% vs 22.3% $P < .001$; *bipolar II* 47.3% vs 12.5% $P = .001$) and history of regular cannabis use (*bipolar I*: 17.5% vs 10.4% $P = .039$; *bipolar II* 23.2% vs 4.5% $P = .040$) were significantly associated with the presence of at least one borderline trait in both groups. History of suicide attempt was significant in bipolar I (51.9% in those with at least one borderline trait vs 27.4% in those with no traits, $P < .001$) but not bipolar II disorder (52.0% in those with at least one trait vs 34.9% in those with no traits, $P = .109$), although the number of bipolar II participants with no borderline traits was small ($n = 24$).

4 | DISCUSSION

4.1 | Study findings

This study investigated the presence and severity of borderline personality traits within a large and well-characterised UK sample of individuals with bipolar disorder. We found that bipolar II disorder was associated with both a greater severity of borderline personality traits and a higher frequency of the presence of any

TABLE 1 Comparison of demographic variables, current mood state and lifetime clinical variables between bipolar I and bipolar II disorder groups

borderline personality trait and of individual borderline personality traits, compared to bipolar I disorder. This is consistent with previous findings which have found higher rates of comorbid borderline personality disorder in bipolar II patients.^{12,13,14} The presence and severity of borderline personality traits found in bipolar II disorder could simply represent misdiagnosis, that is, due to the overlap in symptoms some participants may be more appropriately labelled with a borderline personality disorder than bipolar II disorder. There is some evidence that patients with borderline personality disorder may be more likely to be misdiagnosed with bipolar disorder compared with other psychiatric diagnoses.²⁶ In an outpatient sample Zimmerman et al found that 25% of individuals that had been diagnosed with bipolar II disorder met criteria for borderline personality disorder when subjected to formal diagnostic assessment.²⁷ In our study all participants had their bipolar disorder diagnosis confirmed as their main lifetime diagnosis using a comprehensive semi-structured research diagnostic interview (SCAN) as well as a thorough review of all available clinical information so our findings are unlikely to merely be the result of misdiagnosis. We can be confident that our participants meet DSM criteria for a lifetime diagnosis of bipolar disorder, although it is likely that a

TABLE 2 Comparison of the BEST score and presence of individual BEST items between bipolar I and bipolar II disorder groups

	Bipolar I (n = 1008)	Bipolar II (n = 439)	P value	Adjusted odds ratio ^b (CI) P value
BEST score <i>median (IQR, range)</i>	27 (19, 12-60)	36 (18, 12-60)	<.001	1.036 (1.025-1.048) <.001
Presence of individual BEST items^a:				
Fear of abandonment n (%)	436 (43.3)	263 (59.9)	<.001	1.629 (1.229-2.157) .001
Major shifts in opinion of others n (%)	454 (45.0)	250 (56.9)	<.001	1.398 .237
Extreme changes in self-perception n (%)	536 (53.2)	332 (75.6)	<.001	2.318 (1.701-3.159) .001
Severe mood swings n (%)	456 (45.2)	289 (65.8)	<.001	1.795 (1.338-2.407) <.001
Paranoia n (%)	479 (47.5)	239 (54.4)	.015	1.214 .271
Feelings of anger n (%)	538 (53.4)	311 (70.8)	<.001	1.836 (1.373-2.456) <.001
Feelings of emptiness n (%)	577 (57.2)	356 (81.1)	<.001	2.361 (1.701-3.276) <.001
Suicidality n (%)	443 (43.9)	282 (64.2)	<.001	1.614 (1.206-2.159) .001
Extreme behaviour to prevent abandonment n (%)	243 (24.1)	145 (33.0)	<.001	0.412 .521
Self-harm/suicide attempt n (%)	292 (29.0)	186 (42.4)	<.001	1.340 (1.005-1.788) .046
Impulsive behaviour n (%)	558 (55.4)	318 (72.4)	<.001	1.469 (1.091-1.977) .011
Problems with temper/anger n (%)	334 (33.1)	215 (49.0)	<.001	1.521 (1.150-2.011) .003

Note: ^aBorderline Evaluation of Severity over Time (BEST) score of 1-2 indicates absence of trait, BEST score of 3-5 indicates presence of trait.

^bOR > 1 indicates predictor of bipolar II disorder diagnosis. OR adjusted for: age at participation, Beck Depression Inventory (BDI) score, Altman Mania Scale (AMS score), age of bipolar disorder onset, mean number of episodes of depression and hypomania/mania per year of illness, history of regular cannabis use and history of alcohol misuse. CI: 95% confidence interval. IQR: interquartile range.

proportion has co-morbid borderline personality disorder. By contrast the borderline traits were assessed by self-report, and our findings may simply reflect a misattribution of bipolar symptoms as borderline traits. However, if this were the case, a predominance of overlapping symptoms between the two disorders, such as impulsivity or mood instability, would be expected. We found that while overlapping symptoms were reported by some of our sample, traits specific to borderline personality disorder such as fear of abandonment and an unstable sense of self were also widely reported in the bipolar II group which would support the argument that the increased prevalence and severity of borderline traits are not merely the result of mislabelling bipolar symptoms.

We also found that greater severity of borderline personality traits (higher BEST score) was associated with earlier age of bipolar disorder onset and lifetime history of alcohol misuse in both bipolar I and bipolar II disorder. Even when we considered those having only one borderline trait there was still a significant relationship with younger bipolar

disorder onset and alcohol misuse, so the association was not driven by participants having comorbid borderline personality disorder. Our findings are consistent with a much smaller study which revealed a significant relationship between age of onset of bipolar disorder and the development of borderline personality disorder even when the presence of severe childhood trauma was controlled for.²⁸ The link between childhood trauma and borderline personality disorder has been well established but the role of other neurodevelopmental events such as the early onset of a mood disorder has received far less attention.

The association of borderline personality traits with higher rates of alcohol misuse in both bipolar groups is unsurprising. Rates of alcohol misuse have previously been shown to be higher in bipolar disorder patients with comorbid borderline personality disorder than those without personality disorder, and are likely to represent maladaptive attempts to tolerate distress or to self-medicate.¹⁵ The relationship between borderline personality traits and drug misuse/dependence was less clear in our sample. Regular cannabis and other drug use were

TABLE 3 Relationship of BEST score and clinical outcomes, demographics and current mood state measures in the bipolar I and bipolar II disorder groups

	BEST score	
	Bipolar I (n = 1008)	Bipolar II (n = 439)
Clinical outcomes:		
Age of bipolar disorder onset (in years) ^a	-0.274 P < .001	-0.267 P < .001
Mean number of episodes of hypomania/mania per year of illness ^a	0.211 P < .001	0.199 P < .001
Mean number of episodes of depression per year of illness ^a	0.316 P < .001	0.150 P = .003
History of alcohol misuse ^b	33 (19, 12-60)	38 (16, 13-60)
Present	24 (16, 12-60)	32 (19, 12-59)
Absent	P < .001	P < .001
History of regular cannabis use ^b	34 (19, 12-60)	39 (16, 13-59)
Present	26 (18, 12-60)	35 (18, 12-60)
Absent	P < .001	P = .001
History of regular other drug use ^b	35 (21, 12-60)	42 (16, 13-59)
Present	26 (19, 12-60)	35 (17, 12-60)
Absent	P < .001	P = .002
History of psychotic features ^b	27 (18, 12-60)	37 (18, 12-58)
Present	26.5 (17, 12-57)	34 (18, 12-60)
Absent	P = .798	P = .119
History of suicide attempt ^b	33 (19, 12-60)	39 (16, 12-60)
Present	23 (15, 12-56)	31 (17, 12-60)
Absent	P < .001	P < .001
Demographics:		
Gender ^b	28 (19, 12-60)	38 (18, (12-60)
Female	26 (17, 12-54)	30.50 (16, 12-60)
Male	P = .074	P < .001
Method of recruitment ^b	25 (17, 12-60)	30.00 (20, 12-60)
Systematic	28 (18, 12-60)	36.00 (16, 12-60)
Non-systematic	P = .003	P = .081
Higher education ^b	27 (17, 12-60)	34.00 (15, 12-60)
Present	28 (20,12-60)	38.00 (19,12-60)
Absent	P = .023	P = .063
Age at participation (in years) ^a	-0.191 P < .001	-0.332 P < .001
Current mood state:		
BDI score ^a	0.492 P < .001	0.523 P < .001
AMS score ^a	0.209 P < .001	0.177 P < .001

Note: Totals vary due to unknown/missing data.

^a Spearman's correlation coefficient with Borderline Evaluation of Severity over Time (BEST) score.

^b Median BEST score (interquartile range, range). BDI: Beck Depression Inventory. AMS: Altman Mania Scale.

not significantly associated with severity of borderline traits following adjustment for potential confounders, but the presence of at least one borderline personality trait was associated history of regular cannabis use, but not use of other drugs, in both bipolar groups. This differs from the NESARC study where substance misuse was significantly higher in bipolar I and II disorder with comorbid borderline personality disorder when compared to those without.¹⁵ One explanation may be our use of a dimensional measure of borderline traits rather than a categorical approach. This will have facilitated the inclusion of subsyndromal traits which would have been overlooked in any analysis based on the presence or absence of the diagnosis. It may also be the case that the presence of any borderline traits is associated with substance misuse rather than severity per se.

4.2 | Limitations

There are some limitations to this study. First, the majority of the sample was recruited non-systematically. However, when comparison of BEST traits and total BEST score between bipolar I and bipolar II disorder was limited to the systematically recruited participants, this yielded a comparable pattern of results. Secondly, we used DSM-IV criteria rather than the more recent DSM-5¹⁶ to make the lifetime diagnosis of bipolar I or II disorder. However, we have previously shown that at least 94% of our BDRN participants who meet DSM-IV criteria for lifetime diagnosis of bipolar disorder would also meet the more restrictive DSM-5 criteria.²⁹ Future research should take account of the episode specifiers in DSM-5, particularly mixed features. Thirdly, the BEST questionnaire is a self-report measure and thus subject to recall bias and social desirability. Participants were encouraged to complete the questionnaires in private and honest reporting was encouraged. Fourthly, 39% participants returned the BEST questionnaire. It is difficult to predict whether this respondent bias might lead to an over or underestimate of borderline personality traits. The BEST was included in a mailshot with other questionnaires and responders completed all questionnaires which may reduce the likelihood of the BEST alone contributing to the decision to respond. Given the chaotic behaviours sometimes associated with borderline personality disorder, it is possible that our results represent an underestimate because those with the most severe traits did not respond. Furthermore, the cross-sectional study design prevents conclusions being made about temporal and causal relationships between borderline personality traits and clinical outcomes in bipolar disorder patients. Further research is required to replicate this study with a longitudinal, prospective design in a large independent sample and using an objective measure of borderline personality traits.

4.3 | Conclusions

Our data strongly suggest that borderline personality traits are common in bipolar disorder and are more prevalent and more severe in those with bipolar II as opposed to bipolar I disorder. Borderline trait

presence and severity was associated with course of bipolar illness, most notably younger age of onset and alcohol misuse. Clinicians should be vigilant for borderline personality traits irrespective of whether criteria for categorical diagnosis are met particularly in those with bipolar II disorder and a younger age of bipolar disorder onset. Our findings support the forthcoming changes to personality disorder classification in ICD-11.¹⁹ While the borderline pattern qualifier based on DSM-5(IV) criteria has been retained in ICD-11, there is a much greater emphasis on trait dimensionality and severity than in ICD-10.

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CONFLICT OF INTEREST

All authors have no interests to declare. The views expressed are not those of the NIHR or the NHS.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on reasonable request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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