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CHILD AND ADOLESCENT MENTAL HEALTH

# Body-focused repetitive behaviours are common, distressing and under-recognised: a cross-sectional study from the OxWell Student Survey

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## ABSTRACT

**Background** Body-focused repetitive behaviours (BFRBs), including hair pulling, skin picking and nail biting, are common under-recognised behaviours that often emerge during adolescence. Their occurrence, associated distress and relationship with mental health and social factors remain poorly characterised.

**Objective** To describe the occurrence and co-occurrence of BFRBs in adolescents and examine associations between distressing BFRBs, internalising symptoms, bullying, gender and neurodivergence.

**Methods** Questions about engagement in BFRBs, associated distress and functional interference were included in an optional module of the 2025 OxWell Student Survey. A cross-sectional analysis was conducted in 5437 adolescents aged 11–18 years who completed the module. Problematic BFRBs were defined as at least one BFRB with moderate or high distress. Associations were examined using multivariable logistic regression.

**Findings** Overall, 58.5% of participants reported at least one BFRB. Nail biting was most common (43.6%), followed by skin picking (31.3%) and hair pulling (14.5%). Co-occurrence was common: 84% of hair-pullers and 76% of skin-pickers reported at least one other BFRB. Among those with BFRBs, 22.2% reported moderate-to-high distress, and 3.3% of the total sample reported the highest level of distress. Distressing BFRBs were more common in girls and trans/gender-diverse participants than in boys and were strongly associated with internalising symptoms (6.3% in the normal range vs 34.2% in the clinical range) and bullying (9.6% with no bullying vs 27.1% with >weekly bullying). Distressing BFRBs were also more common in neurodivergent young people (20%) compared with neurotypical peers (10%), but this association was rendered non-significant after adjustment for other variables. In multivariable analyses, internalising symptoms were the strongest predictor (OR 1.97 per 10-point increase), alongside independent associations with gender and frequent bullying.

**Conclusions** Although most adolescents who pick, pull or bite experience little or no distress, a substantial minority experience significant distress that is strongly associated with psychosocial adversity and merits greater clinical attention.

**Clinical implications** Assessing distress, rather than behaviour alone, may improve identification of adolescents with unmet clinical need and help target support for those most likely to benefit from intervention.

### WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Body-focused repetitive behaviours (BFRBs) are common and typically start in adolescence, but have generally been studied as separate disorders (hair pulling, skin picking, etc) in adult populations, with little known about their co-occurrence, associated distress or relationship with broader mental health in population-based samples.

### WHAT THIS STUDY ADDS

⇒ In this large school-based survey, most adolescents reported at least one BFRB and most experienced little or no distress.

⇒ However, around 1 in 10 adolescents reported distressing BFRBs, which were strongly associated with internalising symptoms and bullying.

### HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ BFRBs are not inherently pathological, but a substantial minority of young people experience them as a significant source of distress that is largely overlooked or dismissed.

⇒ Greater recognition in research, healthcare and education will identify unmet need and support the development of effective prevention and intervention strategies for those who need them.

## INTRODUCTION

Body-focused repetitive behaviours (BFRBs) include actions such as picking, pulling or biting at one's hair, skin or nails. Although common within normal grooming practices, for some individuals, they become difficult to control, which can result in physical damage and have a substantial psychological impact.[1–3] BFRBs often emerge in childhood or adolescence[4] but remain under-recognised in clinical, educational and social contexts.

The existing literature generally focuses on individual BFRBs in isolation, limiting our understanding of their co-occurrence and overall prevalence. Hair-pulling and skin-picking are recognised as distinct disorders in the current versions of the Diagnostic Statistical Manual (DSM-5) and

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International Clasification of Diseases (ICD-11), whereas nail-biting and other repetitive grooming behaviours are not separately classified. Diagnostic studies typically report rates of around 1–5% for hair-pulling and skin-picking disorders,[1] while self-report surveys yield substantially higher rates of non-clinical hair-pulling and skin-picking and up to 40–50% for nail-biting.[5–8] These findings suggest a continuum from common grooming behaviours to clinically impairing conditions, but the proportion experiencing significant distress or impairment remains unclear.

This is particularly pertinent during adolescence, which is the most common age of onset for BFRBs.[9] Existing studies in young people report substantial levels of hair-pulling, skin-picking and nail-biting,[8 10 11] alongside associations with anxiety, depression and neurodivergence.[11] Social stressors, such as bullying, exclusion and low belonging, may also be relevant.[12 13] However, few studies have examined these interconnections at scale, particularly among trans and gender-diverse adolescents, who remain under-represented in prevalence research,[14] and for whom there are no studies relating to BFRBs.

The OxWell Student Survey provides an opportunity to address these gaps.[15] For the 2025 wave, we introduced questions about BFRBs, co-designed with individuals with lived experience, for a subset of students aged 11–18 years.[16] We assessed engagement in difficult-to-control hair, skin-focused and nail-focused behaviours, and associated distress and interference across key domains of functioning, including home life, friendships, leisure and classroom learning. By integrating these items alongside validated measures of anxiety, depression, neurodiversity and social context, we were able to: (1) estimate the proportion of the sample who experience the most common BFRBs (hair-pulling, skin-picking and nail-biting), and examine their co-occurrence patterns; (2) quantify associated distress and functional interference across multiple life domains; (3) examine gender differences; and (4) examine the association between problematic BFRBs and self-reported neurodivergence, experience of bullying and higher levels of depression/anxiety.

## METHODS

### Design and setting

This cross-sectional observational study used data from the 2025 OxWell Student Survey,[16] conducted between February and May 2025 from 32 102 students across 49 secondary schools and further education colleges (FECs) in England (the majority of which were state-funded secondary schools in Oxfordshire and Merseyside, see previous work[16] for full details). Participation was voluntary and uncompensated, and most students completed the survey online as part of a lesson during the school day. Students from 39 schools/FECs were invited to complete an optional module (10 schools, comprising 9046 students, elected to add their own additional survey instead). The study was preregistered before data access (https://osf.io/x3uz6/), specifying overarching aims but not a detailed statistical analysis plan or hypotheses. Analyses are therefore treated as exploratory.

### Participants

Students aged 11–18 years who consented and completed the optional BFRB module were included. Of the 16 861 students who answered the final question on the core survey, 6910 (41%) continued to the optional survey. Participants aged 19 years or older (N=59) were excluded to align the analytic sample with a typical school-age population (participant flow diagram in online supplemental material 1).

### Measures

The variables used for this study are listed in online supplemental material 2, and the full list of variables for the OxWell 2025 survey is publicly available (https://osf.io/sekhr/files/r6tnm).

#### Demographic variables

Age was derived from a categorical survey item and converted to a continuous numeric variable (years) for analyses. Gender response options were: boy/man, girl/woman, trans and gender diverse, prefer not to say and not sure. For regression analyses, gender was recoded into three categories: boys/men, girls/women and trans/gender diverse/unsure (henceforth referred to as TGD). Responses of 'prefer not to say' and other non-informative or missing responses were retained for descriptive tables and treated as missing.

#### Body-focused repetitive behaviours (BFRBs)

BFRBs were assessed with three questions co-designed by the authors (clinical, scientific and lived experience expertise), using input from 26 people with self-declared lived experience of BFRBs who piloted and commented on the items. The items were:

1. **Do you sometimes pick, pull or bite at your hair, skin or nails in a way that feels difficult to control?** Response (tick all that apply): No; hair pulling; skin picking; nail biting; other.
2. **Does this behaviour upset or distress you?** Response: Not at all; only a little; quite a lot; a great deal.
3. **Does this behaviour interfere with your everyday life in the following areas?** (a) Home life; (b) friendships; (c) leisure activities; (d) classroom learning. Response for each domain: Not at all; only a little; quite a lot; a great deal.

Participants could endorse multiple BFRBs; non-mutually exclusive indicators were created for hair pulling, skin picking, nail biting and other BFRBs, together with a total BFRB count.

Distress was coded from 0 ('Not at all') to 3 ('A great deal') and treated as an ordered categorical outcome in ordinal regression models. Analyses of distress distributions were restricted to participants reporting at least one BFRB and providing valid distress responses.

**Problematic BFRBs** (primary binary outcome): Participants were classified as having problematic BFRBs if they endorsed at least one BFRB and reported associated distress of 'Quite a lot' or 'A great deal' (ie, distress score ≥2).

**Severity** (secondary outcome): A three-level ordinal severity outcome was derived for secondary analyses: none (no BFRB), BFRB with low/no distress and BFRB with high distress (problematic as defined above). For descriptive figures we also derived commonly used groupings such as 'nail biting only' (nail biting endorsed and no other BFRB endorsed) and 'three+' (endorsement of three or more BFRBs).

#### *Functional interference*

Interference in four domains (home life, friendships, leisure activities, classroom learning) was captured using the same four-point scale as distress. Where multiple responses were recorded within a domain or participants provided composite answers, the maximum reported severity for that domain was used.

#### Neurodivergence and autistic traits

Neurodivergence was derived from self-reported diagnoses of autism, Attention deficit hyperactivity disorder (ADHD) and other neurodevelopmental conditions and was categorised as:



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none, autism, ADHD and both autism+ADHD (AuDHD. Note that those who endorsed 'other' without also endorsing autism or ADHD were not included).

Autistic traits were measured using six items drawn from the Comprehensive Autistic Trait Inventory (CATI)[17] representing social interaction, communication/social camouflage, repetitive behaviours, cognitive rigidity and sensory sensitivity. Items were rated 1–5, with the social interaction item reverse-coded to align directionality. Item scores were summed to produce a total (range 6–30), with totals prorated when one item was missing; participants missing ≥2 items were excluded. CATI scores were standardised (z-score) for modelling. This abbreviated 6-item version of the CATI has been used in another large-scale UK survey[18] but is not formally validated and showed modest internal consistency in this sample (α=0.63).

### Bullying

Recent bullying was assessed with a categorical item taken from the Revised Olweus Bullying Questionnaire[19] about frequency in the past couple of months. For analysis, responses were collapsed into three categories: None (no bullying), <weekly (responses 'Once, twice or a few times' and '2 or 3 times a month') and >weekly (responses 'About once a week' and 'Several times a week'). Non-response categories were coded as missing.

### Mental health (internalising symptoms)

Internalising symptoms were assessed using the 25-item Revised Children's Anxiety and Depression Scale (RCADS).[20] For descriptive figures, we used the RCADS total imputed category ('normal', 'borderline' or 'clinical'). The primary multivariable model reported in the manuscript includes the RCADS total imputed score entered as a continuous predictor. Post hoc models examined anxiety and depression subscales separately.

## Statistical analysis

All analyses were performed in R (V.4.5.2) using libraries: dplyr; ggplot2; MASS::polr and stats::glm.

### Descriptive analyses

Point frequency estimates were calculated for each BFRB type and composite indicators. Distress and functional interference were summarised within BFRB groupings and by gender. To assess potential bias from gender differences between the analytic sample and full OxWell cohort, a gender-standardised estimate of BFRB occurrence was calculated.

Co-occurrence was examined using BFRB count and the proportion reporting multiple BFRBs (≥2), with conditional probabilities used to compare co-occurrence across BFRB types.

Variation in distress by BFRB type was examined using proportional-odds ordinal logistic regression, with non-mutually exclusive indicators for hair pulling, skin picking, nail biting and other BFRBs entered simultaneously and adjustment for gender.

### Primary model: problematic BFRBs

Problematic BFRBs were analysed using multivariable logistic regression. Gender, neurodivergence, bullying frequency, continuous RCADS score and age were entered simultaneously. Boys/men, no neurodivergence and no bullying served as reference categories. Adjusted ORs and 95% CIs were obtained by exponentiating model coefficients and standard errors.

**Table 1** Demographics and summary measures

| Variable | Boys/men | Girls/women | TGD | Total |
|---|---|---|---|---|
| N | 2033 | 3053 | 272 | 5437 |
| Age in years, mean (SD) | 13.7 (1.8) | 13.9 (1.8) | 14.7 (2.1) | 13.8 (1.8) |
| Any BFRB N (%) | 928 (45.6%) | 1973 (64.6%) | 229 (84.2%) | 3183 (58.5%) |
| Hair pulling | 133 (6.5%) | 538 (17.6%) | 92 (33.8%) | 787 (14.5%) |
| Skin picking | 305 (15.0%) | 1191 (39.0%) | 173 (63.6%) | 1704 (31.3%) |
| Nail biting | 759 (37.3%) | 1424 (46.6%) | 156 (57.4%) | 2369 (43.6%) |
| Problematic BFRBs (distress at least 'quite a lot') | 113 (5.6%) | 500 (16.4%) | 68 (25.0%) | 691 (12.7%) |
| RCADS total mean (SD) | 16.4 (12.9) | 26.2 (15.4) | 37.8 (15.8) | 23.1 (15.6) |
| Bullying N (%) | | | | |
| None | 1528 (77.6%) | 2292 (77.4%) | 140 (54.1%) | 3999 (76.2%) |
| <weekly | 308 (15.6%) | 516 (17.4%) | 78 (30.1%) | 916 (17.5%) |
| >weekly | 134 (6.8%) | 152 (5.1%) | 41 (15.8%) | 332 (6.3%) |
| Neurodivergence | | | | |
| None | 1471 (73.4%) | 2327 (78.4%) | 112 (42.1%) | 3968 (74.7%) |
| Autism | 158 (7.9%) | 145 (4.9%) | 48 (18.0%) | 358 (6.7%) |
| ADHD | 219 (10.9%) | 331 (11.2%) | 30 (11.3%) | 585 (11.0%) |
| Both | 155 (7.7%) | 164 (5.5%) | 76 (28.6%) | 401 (7.5%) |
| CATI mean (SD) | 17.9 (4.5) | 19.5 (4.4) | 23.0 (4.0) | 19.1 (4.6) |

Problematic BFRBs=at least one BFRB endorsed with at least 'quite a lot' of distress. ADHD = attention deficit hyperactivity disorder. The total score=anxiety+depression. CATI=6 items from the Comprehensive Autistic Trait Inventory. Note: 79 participants did not provide gender information but are included in the total
BFRBs, body-focused repetitive behaviours; CATI, Comprehensive Autistic Trait Inventory; RCADS, Revised Children's Anxiety and Depression Scale; TGD, trans/gender diverse/unsure.

### Secondary severity and post hoc sensitivity analyses

BFRB severity (none, low/no distress, high distress) was analysed using proportional-odds regression. Post hoc analyses examined depression and anxiety subscales simultaneously and dimensional autistic traits alongside categorical neurodivergence. To assess potential school-level clustering, the primary analysis was repeated using multilevel logistic regression with school as a random intercept.

### Missing data

Analyses used available-case approaches per model: observations missing any variable required by a particular model were excluded from that model. Survey specific non-response codes (eg, NoResponse(Item), NoResponse(Stopped_vB)) were treated as missing.

### Statistical significance

Statistical significance was defined as $p<0.05$. All tests are two sided.

## RESULTS

A total of 5437 OxWell 2025 participants aged 11–18 years completed the optional BFRB questions and are included in this analysis. Demographic, BFRB and covariate summary data are shown in table 1. Age data were missing for 217 participants due to item non-response. Compared with the full[16] sample (N=32 102), the BFRB subset included a greater proportion of girls/women (55% vs 46%) and TGD participants (4.8% vs 3.5%), and a lower proportion of boys/men (38% vs 44.8%) (X-sq=491.7, df=3, p<0.01). Although there was a statistically



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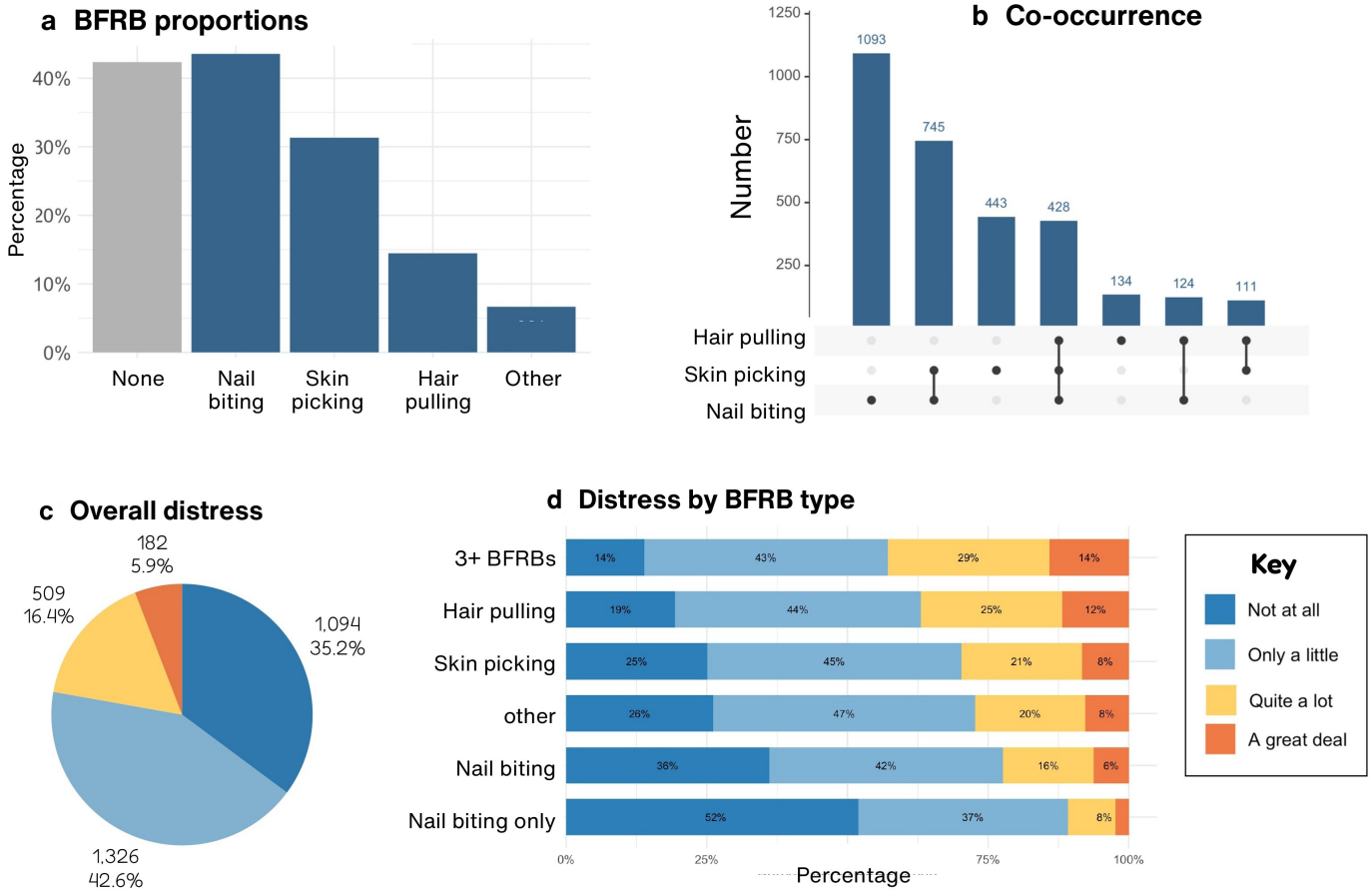


**Figure 1** Occurrence, co-occurrence and distress associated with body-focused repetitive behaviours (BFRBs) in adolescents. (a) Proportion of participants reporting each BFRB. Participants could endorse more than one behaviour; therefore, percentages are not mutually exclusive. (b) UpSet plot showing the most common combinations of hair pulling, skin picking and nail biting. Bars represent the number of participants reporting each combination. (c) Distribution of self-reported distress associated with BFRBs among participants reporting at least one BFRB. (d) Self-reported distress by BFRB type and by participants reporting three or more BFRBs. Percentages are shown within each BFRB group.

significant difference in age between participants who did and did not complete the optional BFRB items ($p<0.001$), the magnitude of this difference was negligible (M=14.1 vs 13.8 years; Cohen's d=0.12). Compared with participants who did not enter the optional survey, those who completed the optional module reported higher levels of internalising symptoms (mean RCADS score 22.9 vs 18.2; 95% CI 4.3 to 5.2, $p<0.001$). This difference remained after adjusting for gender (adjusted mean difference=3.6 points, $\beta=3.6$, SE=0.2, $p<0.001$).

### Proportions and co-occurrence patterns

Overall, 58.5% of participants reported engaging in at least one BFRB (figure 1a). Nail biting was the most commonly reported behaviour (43.6%), followed by skin picking (31.3%) and hair pulling (14.5%), while 6.6% reported other BFRBs. Participants could endorse multiple behaviours; therefore, proportions for individual BFRBs are not mutually exclusive. Given the overrepresentation of girls/women and TGD participants in the BFRB sample, a gender-standardised estimate of the proportion of BFRBs in the full OxWell cohort was slightly lower at 56.9%.

BFRBs frequently co-occurred within individuals. While 31.8% of participants reported a single behaviour, 17.6% reported two behaviours, 7.7% reported three behaviours and 1.5% reported all four behaviours. Among those reporting any BFRB, nearly half reported more than one behaviour, indicating that these behaviours commonly cluster rather than occurring in isolation. Co-occurrence also varied by BFRB type: among participants reporting hair pulling, 83.6% also reported at least one additional BFRB, compared with 75.6% of those reporting skin picking and 55.8% of those reporting nail biting (figure 1b).

### Distress and functional interference

Among participants reporting at least one BFRB and providing valid distress data, most described low levels of associated distress, with 35.2% reporting no distress and 42.6% reporting only a little distress. However, a substantial minority reported higher levels of distress, with 16.4% reporting 'quite a lot' and 5.9% reporting 'a great deal', indicating that 22.2% experienced moderate to high levels of distress (figure 1c). Taken as a proportion of the whole sample, 691 participants (12.7%) met criteria for problematic BFRBs, defined as reporting at least one BFRB together with moderate to high levels of distress, and 182 participants (3.3%) reported the highest level of distress.

Distress varied by BFRB type (figure 1d). Nail biting alone was associated with relatively low levels of distress, with the majority of participants reporting no or only minimal distress. In contrast, hair pulling and skin picking were associated with substantially higher levels of distress, with a greater proportion of participants reporting 'quite a lot' or 'a great deal' of distress. Participants



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reporting multiple BFRBs (three or more) showed the highest levels of distress overall.

In ordinal regression analyses adjusting for co-occurring BFRBs and gender, hair pulling and skin picking were both associated with substantially higher levels of distress (hair pulling: OR=2.32, 95% CI 1.98 to 2.71; skin picking: OR=2.22, 95% CI 1.92 to 2.56). Nail biting was associated with a more modest increase in distress (OR=1.29, 95% CI 1.11 to 1.51), while other BFRBs showed intermediate effects (OR=1.64, 95% CI 1.33 to 2.02).

BFRBs were associated with functional interference across the domains of home life, friendships, leisure activities and classroom learning. Interference was reported less often among participants reporting nail biting alone (5–13%), but was more common among those reporting skin picking (13–29%) and hair pulling (18–39%) (more details in online supplemental material 3). The highest level of impairment across all domains was observed among participants reporting a great deal of distress (37–64%). Although the patterns were similar across domains, the highest frequency of impairment was reported for leisure activities.

## Gender differences

There were marked differences in BFRBs by gender (figure 2). Overall, 45.6% of 2033 boys/men reported at least one BFRB, compared with 64.6% of 3053 girls/women and 84.2% of 272 TGD participants. Girls/women and TGD participants consistently reported higher proportions across individual behaviours, particularly hair pulling and skin picking; for example, skin picking was reported by 15.0% of boys/men, 39.0% of girls/women and 63.6% of TGD participants. Nail biting was the most common behaviour across all groups.

BFRB-related distress also differed by gender. Moderate-to-high distress was reported by 12.4% of boys/men, 26.0% of girls/women and 30.0% of TGD participants, while the highest level of distress ('a great deal') was reported by 3.7%, 6.6% and 8.4%, respectively.

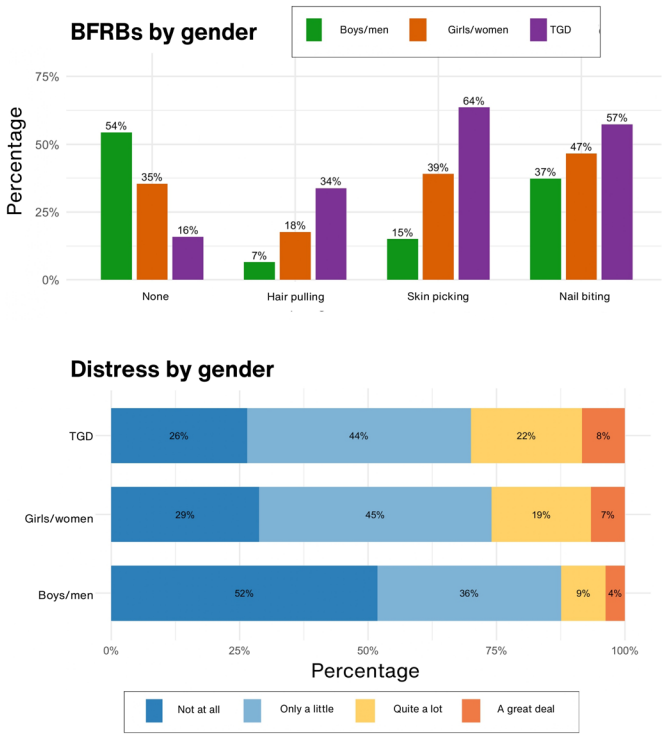


**Figure 2** BFRBs and associated distress by gender. Upper panel: Proportion of participants reporting each BFRB by gender. Participants could endorse more than one BFRB; therefore, percentages are not mutually exclusive. Lower panel: Distribution of self-reported distress associated with BFRBs among participants reporting at least one BFRB, shown by gender. BFRBs, body-focused repetitive behaviours; TGD, trans/gender-diverse or unsure.

## Associations between BFRBs and self-reported measures of neurodiversity, bullying and mental health

The proportion of participants reporting problematic BFRBs was higher among those identifying as neurodivergent (figure 3). Among participants reporting no neurodivergent condition, 10.2% met criteria for problematic BFRBs, compared with 18.4% of those reporting autism, 20.3% of those reporting ADHD, and 20.7% of those reporting both autism and ADHD.

Problematic BFRBs were also more common among participants reporting recent bullying (figure 3), increasing from 9.6%

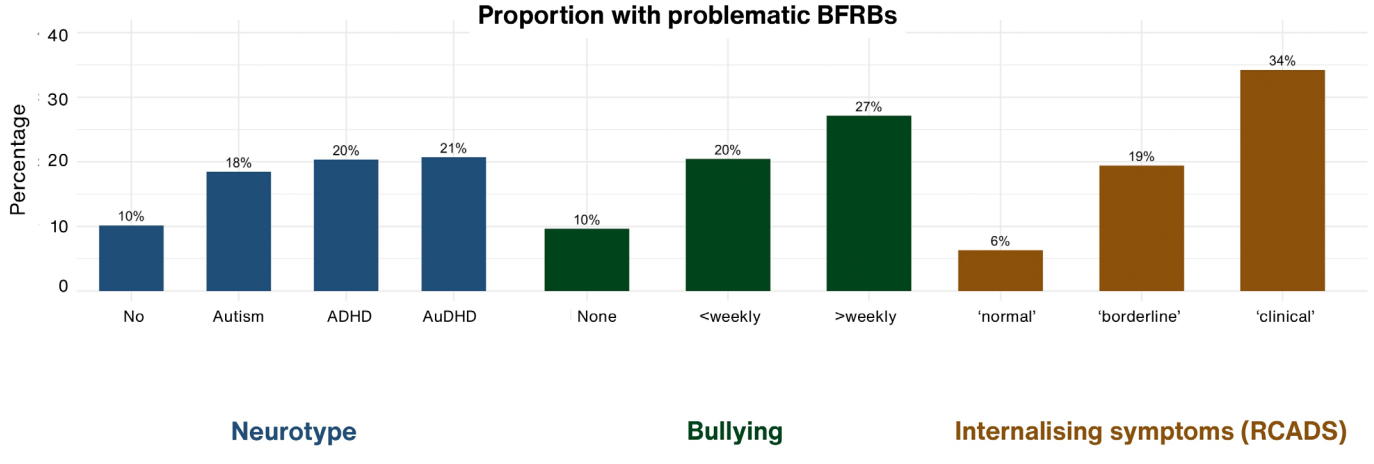


**Figure 3** Proportion of participants with problematic body-focused repetitive behaviours (BFRBs) by neurodivergence, recent bullying and internalising symptoms. Problematic BFRBs were defined as at least one BFRB associated with moderate or high distress. Internalising symptoms were assessed using the Revised Child Anxiety and Depression Scale (RCADS) total score.



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among those reporting no bullying to 20.4% with less frequent bullying and 27.1% with more than weekly bullying.

There was a strong gradient with internalising symptoms (figure 3): 6.3% of participants in the normal RCADS range met criteria for problematic BFRBs, compared with 19.4% in the borderline and 34.2% in the clinical range. BFRB-related distress was also moderately correlated with depressive symptoms (Spearman's $\rho=0.41$, $p<0.001$).

In the multivariable logistic regression model, internalising symptoms remained strongly associated with problematic BFRBs (OR=1.07 per one-point increase, 95% CI 1.07 to 1.08, $p<0.001$), corresponding to 1.97 per 10-point increase. Gender differences also remained after adjustment. Compared with boys/men, girls/women had higher odds of problematic BFRBs (OR=1.79, 95% CI 1.40 to 2.29, $p<0.001$), as did TGD participants (OR=1.56, 95% CI 1.05 to 2.32, $p=0.027$). Recent regular (>weekly) bullying remained associated with increased odds of problematic BFRBs (OR=1.39, 95% CI 1.01 to 1.93, $p=0.046$), while the association for less frequent bullying was in the same direction but did not reach statistical significance ($p=0.070$). In contrast, neurodivergence and age were not independently associated with problematic BFRBs after adjustment for other variables. Overall, the model substantially improved fit compared with the null model, indicating that these variables jointly explained variation in problematic BFRBs.

As a secondary analysis, BFRB severity (none, low/no distress, high distress) was examined using ordinal regression. The pattern of results was consistent with the primary model, with higher internalising symptoms associated with greater severity, and gender and bullying also showing associations with increasing severity. Neurodivergence was associated with severity in this model, suggesting effects across the full spectrum of BFRB severity.

In post hoc analyses including both depression and anxiety scores, both were independently associated with problematic BFRBs. However, these estimates should be interpreted cautiously given the high correlation between the two measures. Higher autistic trait scores (CATI) were associated with increased odds of problematic BFRBs. In models including both CATI scores and categorical neurodivergence, CATI remained associated, whereas neurodivergence was no longer significant, suggesting that dimensional autistic traits accounted for the observed association with neurodivergence.

Sensitivity analyses accounting for clustering at the school level yielded substantively identical results, with negligible between-school variance after adjustment for covariates.

## DISCUSSION

In this large community survey of school-aged adolescents (n=5437), 58.5% reported experiencing at least one BFRB, with the most common being nail-biting, followed by skin-picking then hair-pulling. A substantial minority (13% overall, or 22% of those with at least one BFRB) reported meaningful distress. Co-occurrence is the norm, with 84% of hair-pullers and 76% of skin-pickers reporting at least one other BFRB, suggesting that BFRBs should be conceptualised as a multi-behaviour syndrome rather than discrete conditions. Girls and TGD individuals were more likely to report BFRBs and associated distress than boys. Problematic BFRBs were also significantly associated with internalising symptoms (depression and anxiety) and recent bullying. Overall, the results confirm that distressing BFRBs are common in adolescents, and neglect of these conditions might be particularly problematic for those who are also struggling with mental health and social challenges.

Nearly half of those reporting any BFRB endorsed more than one behaviour. Co-occurrence varied by BFRB type: participants reporting hair pulling or skin picking were more likely to report multiple behaviours than those reporting nail biting. Together, these findings suggest that BFRBs may be better conceptualised as manifestations of a shared underlying process, rather than as distinct conditions. This challenges the tendency in the literature to examine individual BFRBs separately, and may help explain their overlapping associations with internalising symptoms and social stressors.[21] Developing a shared understanding and language around BFRBs has important implications for how they are screened for, assessed and addressed in clinical and research settings.[22]

The proportion of young people reporting distressing BFRBs in our sample was broadly consistent with prior population-based self-report studies, which tend to yield higher rates than clinical or diagnostic studies.[3] Although many participants reported little or no associated distress, 22% experienced at least moderate distress, and a smaller group (6% of those with BFRBs, 3% of the whole sample) reported a great deal of distress. BFRBs were associated with functional interference across home life, friendships, leisure and classroom learning, and interference was greatest among those reporting the highest levels of distress, supporting distress as a key marker of impact.

Gender differences were evident in both BFRBs occurrence and associated distress, with girls/women and TGD participants being more likely to report BFRBs and to experience greater associated distress. These differences persisted after adjustment for internalising symptoms and other variables, suggesting that they are not fully explained by differences in anxiety or depression. The difference in overall BFRBs between girls (65%) and boys (46%) was substantially smaller than the approximately 4:1 female:male ratio reported in adult clinical samples.[1 9] Using 'a great deal' of distress as a proxy for likely clinical need narrowed this difference further to around 1:1.8. We also report, for the first time, substantially higher proportions of BFRBs in TGD individuals (84% overall, 8.4% with a great deal of distress), extending the limited literature on BFRBs in gender/sexual minorities.[23]

Problematic BFRBs were strongly associated with internalising symptoms. We observed a steep gradient across RCADS categories, alongside a moderate correlation between distress and depressive symptoms, consistent with findings from previous adolescent[24] and adult[6] samples. These associations are also consistent with models in which BFRBs may function as self-regulatory responses to emotional distress.[25] Unfortunately, BFRBs often become chronic sources of suffering in their own right, characterised by loss of control, shame and concealment,[26] creating a vicious cycle of urges and consequences.[27]

Bullying was also associated with problematic BFRBs and increased with reported bullying frequency. The association persisted after adjustment for internalising symptoms, suggesting that bullying may be associated with problematic BFRBs through pathways not fully captured by symptom measures alone. This is consistent with proposed links between interpersonal stress and repetitive behaviours, potentially through increased self-consciousness, shame or emotional dysregulation.[12 13] Evidence from non-human primates also suggests that self-grooming behaviours are more common in individuals experiencing greater 'social uncertainty'.[28] Self-grooming may have a particular soothing function in relation to social isolation or ambiguity.



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Problematic BFRBs were more common in neurodivergent young people, although this association was no longer significant after adjustment for internalising symptoms, gender and bullying. Ordinal analysis of severity showed an association with neurodivergence, while dimensional autistic traits were also associated with problematic BFRBs. This suggests that dimensional characteristics may better capture neurodevelopmental difference relevant to BFRBs than diagnostic categories alone, although these findings should be interpreted with caution given the modest internal consistency ($\alpha$=0.63) of the abbreviated CATI.

The major strengths of this study lie in the large sample size of young people who reported BFRBs alongside measures of mental health and well-being. OxWell is conducted through collaborations with schools, and the surveys are carried out in normal school time, increasing the representativeness of the sample relative to typical research cohorts. Nevertheless, there are some aspects of the study that require methodological consideration. First, the BFRB questions were co-designed by clinicians, researchers and individuals with lived experience to ascertain BFRB occurrence and associated distress and impairment in a general population. They were evaluated for clarity, acceptability and face validity by 26 people with lived experience, but have not undergone formal psychometric evaluation. They were condensed relative to diagnostic measures, prioritising distress and functional impairment over behavioural severity, and therefore do not establish respondents' diagnostic status. Consequently, our estimates may not be directly comparable with studies using validated diagnostic instruments or structured clinical interviews. Second, the sample included in these analyses comprised those who volunteered to undertake an optional add-on module to the main OxWell survey, so is therefore not fully representative of the full survey population. This sample included a greater proportion of girls/women and TGD individuals relative to boys, were slightly older, and had significantly higher levels of internalising symptoms in comparison with the full sample. Consequently, BFRB estimates may overrepresent young people experiencing emotional difficulties and should not be assumed to be fully representative of the OxWell cohort, or the wider population. Because of this limitation, we have avoided using the word 'prevalence' and instead describe our observations as 'proportions' throughout. Finally, the cross-sectional design precludes causal inference. This is particularly relevant to the strong association between internalising symptoms and problematic BFRBs, which prior work suggests may be bidirectional.[24 26]

To conclude, BFRBs are common in adolescents and frequently co-occur. For a substantial minority, BFRBs are a significant source of distress and impairment, yet are rarely assessed in clinical, school or community settings, meaning that young people experiencing clinically meaningful difficulties continue to go unsupported. Simple screening questions focused on distress, rather than behaviour alone, could help identify young people who are in need of support.[22] For example, 'Do you ever pick, pull or bite at your hair, skin or nails in a way that upsets you or gets in the way of things you want to do?' Internalising symptoms and interpersonal stress, such as bullying, may represent important targets for future intervention studies, especially among girls and gender-diverse young people. These behaviours are, by their nature, persistent, and so too must be our efforts to recognise, understand and support those who struggle with them.

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**Data availability statement** Data are available upon reasonable request. The data used in this study are not publicly available. The study protocol, variable guides, the full list of questions and other supporting information are available on the OxWell Open Science Framework website (https://osf.io/sekhr/). Fully deidentified extracts of the data can be provided to academic research collaborators upon reasonable request after a review process by the research team to ensure that uses of the data fall under the remit of the intended purposes set out in the privacy information and to prevent duplication of analyses.

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