

Attachment insecurity predicts worse outcome in patients with eating disorders treated with enhanced cognitive behavior therapy: A one-year follow-up study

Eleonora Rossi MD¹  | Emanuele Cassioli MD¹  | Michela Martelli MD¹ |
Giulia Melani MD¹ | Vivienne M. Hazzard PhD²  | Ross D. Crosby PhD³ |
Stephen A. Wonderlich PhD³  | Valdo Ricca MD¹ | Giovanni Castellini PhD¹ 

¹Psychiatry Unit, Department of Health Sciences, University of Florence, Florence, Italy

²Department of Psychiatry & Behavioral Sciences, University of Minnesota Medical School, Minneapolis, Minnesota, USA

³Sanford Center for Biobehavioral Research, Fargo, North Dakota, USA

Correspondence

Giovanni Castellini, Psychiatry Unit, Department of Health Sciences, University of Florence, Florence, Italy.
Email: giovanni.castellini@unifi.it

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Abstract

Objective: This study aimed to explore the role of attachment insecurity in predicting a worse longitudinal trend of eating disorder (ED) psychopathology and body uneasiness in patients with Anorexia Nervosa (AN) or Bulimia Nervosa (BN) treated with Enhanced Cognitive Behavior Therapy, considering the longitudinal interplay between these dimensions.

Method: In total, 185 patients with AN or BN performed the baseline assessment, and 123 were re-evaluated after 1 year of treatment. Participants completed questionnaires evaluating ED psychopathology (Eating Disorders Examination Questionnaire) and body uneasiness (body uneasiness test). For the assessment of adult attachment, the Experiences in Close Relationships-Revised was administered at baseline. Bivariate latent change score analysis within the structural equation modeling framework was performed to investigate the evolution of ED psychopathology and body uneasiness, their longitudinal interplay, and the role of attachment style as an outcome predictor.

Results: After treatment, all psychopathological features showed an overall improvement. Higher baseline levels of body uneasiness predicted a worse course of ED psychopathology. The change in body uneasiness over time depended on changes over time in ED psychopathology, but not vice versa. Insecure attachment predicted a worse longitudinal trend of ED psychopathology, and, through this impairment, it indirectly maintained higher levels of body uneasiness, as confirmed by mediation analyses.

Discussion: The role of attachment insecurity as a predictor of treatment outcome suggests the need for an integration of the cognitive-behavioral conceptualization of EDs with a developmental perspective that considers attachment-related issues.

Public significance statement: Considering the burden of EDs in terms of public health and the unsatisfactory response to standard treatments, the identification of

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outcome predictors is of considerable clinical interest. This study demonstrated that attachment insecurity was associated with worse longitudinal trends of ED psychopathology and body uneasiness in patients with AN and BN treated with CBT-E, highlighting the importance of personalizing treatment programs taking into account a developmental perspective on these disorders.

KEYWORDS

attachment style, bivariate latent change score, body uneasiness, cognitive-behavior therapy, eating disorders, longitudinal structural equation modeling, treatment outcome

1 | INTRODUCTION

Anorexia Nervosa (AN) and Bulimia Nervosa (BN) are severe eating disorders (EDs) that mainly affect young women (American Psychiatric Association, 2013) with a high risk of chronicity, long-term disability and a significant mortality rate (van Hoeken & Hoek, 2020). At present, Enhanced Cognitive Behavior Therapy (CBT-E) is considered among first-line treatments for these disorders in adults, as recommended by the guidelines of the National Institute for Health and Care Excellence (NICE) (National Institute for Health and Care Excellence, 2020). The main target of CBT-E is the ED-specific psychopathological core represented by the overvaluation of the importance of body shape and weight in determining one's self-esteem (Fairburn, 2008). Despite the evidence of the efficacy of this approach, post-treatment remission rates are far from satisfactory, as they settle around 50% (Atwood & Friedman, 2020; De Jong et al., 2018). For this reason, identifying factors that predict treatment outcome, as well as new potential therapeutic targets, represent matters of primary importance. In particular, the identification of variables associated with a worse long-term trajectory in terms of body image would have significant clinical implications. Indeed, the restoration of healthy body image is often considered the final hurdle in the recovery process of EDs (Bardone-Cone et al., 2010) and several studies described persistence of negative body image at the end of treatments (Ricca et al., 2010; Sauro et al., 2013), which is considered a risk factor for subsequent relapses of full-blown ED symptomatology (Carter et al., 2004; Stice & Shaw, 2002). In this context, great attention has been devoted to the construal of body uneasiness, which consists of a negative cognitive-affective attitude towards the body that extends the concept of body dissatisfaction to include several other aspects of negative body image, such as estrangement and detachment feelings towards one's body and avoidance or, on the contrary, overcontrol of one's body (Cuzzolaro et al., 2006).

In recent years, more and more importance has been devoted to attachment theory as a potentially crucial framework to help to conceptualize and treat EDs (Tasca, 2019). This theory posits that the quality of the repeated interactions of the infant with the caregiver in moments of need is encoded within the memory and results in different patterns of relational expectations and behaviors and of emotion regulation strategies that are known as adult attachment styles (Bowlby, 1982; Fraley & Shaver, 2000; Shaver & Mikulincer, 2002). In

particular, two main dimensions define adult attachment: attachment anxiety and avoidance (Brennan et al., 1998; Fraley et al., 2015; Mikulincer et al., 2003). Attachment anxiety typically develops when the caregiver inconsistently responds to the infant's attachment needs and is characterized by a strong need for closeness and a deep fear of interpersonal rejection (Mikulincer et al., 2003; Mikulincer & Shaver, 2007). On the other side, attachment avoidance typically develops when the caregiver constantly frustrates the attachment needs of the baby and is defined by strivings for self-reliance and avoidance of closeness and intimacy in interpersonal relationships (Mikulincer et al., 2003; Mikulincer & Shaver, 2007). Attachment security develops when interactions with the caregiver are positive and is defined in the presence of low levels of both anxiety and avoidance, comfort with interdependence and intimacy, and reliance on the possibility to obtain support from others in case of distress (Mikulincer et al., 2003; Mikulincer & Shaver, 2007). On the other hand, attachment insecurity is characterized by high levels of attachment anxiety or avoidance (Mikulincer et al., 2003; Mikulincer & Shaver, 2007) and is considered a transdiagnostic risk factor for the development of psychiatric diseases, including EDs (Mikulincer & Shaver, 2012; Tasca, 2019; Tasca & Balfour, 2014).

From the very beginning, Bowlby conceptualized attachment theory as a guide for clinical practice (Bowlby, 1982). Consequently, an increasing interest developed regarding the application of an attachment theory perspective to psychotherapies and several studies showed an association between attachment insecurity and poorer response to psychological treatments (Berant & Obegi, 2009; Levy et al., 2011). Regarding AN and BN, the existing literature mainly concerns group therapies. In particular, these studies showed an association between anxious attachment and a worse prognosis both in terms of ED psychopathology (Illing et al., 2010) and comorbid depressive symptoms (Keating et al., 2015) in patients with AN and BN. Furthermore, attachment avoidance is associated with higher dropout rates in patients with AN binge eating-purging subtype (Tasca et al., 2004). As far as individual cognitive-behavioral therapies are concerned, to the best of our knowledge, the only available study is the one performed by Daniel et al. (Daniel et al., 2016) in a sample of patients with BN. This study did not find an association between attachment insecurity and treatment outcome. However, it should be noted that these results should be viewed as preliminary considering the very limited sample size. No study to date has evaluated the

association between attachment insecurity and response to CBT-E in patients with AN. Furthermore, despite the presence of a great amount of data on the association between attachment insecurity and negative body image (Tasca, 2019; Tasca & Balfour, 2014), no study has evaluated the role of adult attachment in influencing the restoration of healthy body image in patients with EDs treated with CBT-E.

In light of the aforementioned considerations, the main objective of this study was to test the hypothesis that high levels of attachment anxiety and avoidance may be associated with poorer outcome in patients with AN and BN treated with CBT-E. Specifically, it aimed to explore the role of attachment insecurity in relation to ED-specific psychopathology and body uneasiness, taking into consideration the longitudinal coupling between these dimensions.

2 | METHOD

This longitudinal study with a one-year follow-up was conducted at the Clinic for EDs of the University of Florence. The enrollment took place from January 2018 to September 2021. The study procedures were described to all participants, and signed informed consent was required for participation. The study protocol was approved by the ethics committee of the local institution, and the study was conducted in accordance with the guidelines of the Declaration of Helsinki of 1964 and subsequent amendments.

2.1 | Participants

Patients were recruited based on the following inclusion criteria: female sex; age between 18 and 60 years; current diagnosis of AN or BN according to the Diagnostic and Statistical Manual of Mental Disorders (Fifth Edition) (DSM-5) (American Psychiatric Association, 2013), as assessed by the Structured Clinical Interview for DSM-5 Disorders, clinical version (SCID-5-CV) (First et al., 2016). Exclusion criteria were as follows: intellectual disability; illiteracy or any other condition that might compromise the understanding of the protocol and the completion of the questionnaires; severe medical (e.g., cardiac or renal failure) or psychiatric (e.g., suicidal ideation or manic episode) conditions precluding outpatient treatment; absence of written informed consent. Of the 200 patients consecutively referred, 11 individuals declined to participate and 4 were excluded for severe medical conditions.

2.2 | Assessment

Patients were assessed during the first psychiatric visit (T0, baseline), and treatment-completers were evaluated again at the end of treatment, 1 year after the first evaluation (T1). Psychiatrists with expertise in diagnosing and treating EDs conducted all assessments, collecting sociodemographic and clinical data. Calibrated instruments were used for anthropometric measures. At follow-up, data were collected

regarding the presence of remission, defined according to DSM-5 criteria (American Psychiatric Association, 2013), as assessed by the SCID-5-CV (First et al., 2016). Specifically, full remission was defined as the absence of all DSM-5 criteria for a sustained period of time, whereas partial remission was defined as the persistence of one or more, but not all, DSM-5 diagnostic criteria (with the exception of the underweight criterion for AN, which must not be met) (American Psychiatric Association, 2013). Considering that the DSM-5 does not specify a clear definition of the length of the “sustained period of time” required for the definition of remission, the threshold was fixed at 1 month for partial remission, and 3 months for full remission, following the standardized criteria proposed by Khalsa et al. (Khalsa et al., 2017).

At baseline, all participants were asked to complete the following self-administered tests using validated Italian versions:

- Experiences in close relationships–revised (ECR-R) (Busonera et al., 2014; Fraley et al., 2000) for the evaluation of adult attachment. In particular, it includes two subscales for the evaluation of attachment anxiety (ECR Anxiety) and avoidance (ECR Avoidance). Both scores showed excellent internal consistencies in the present sample (Cronbach's $\alpha_{\text{Anxiety}} = 0.91$; Cronbach's $\alpha_{\text{Avoidance}} = 0.94$). Higher scores indicate higher levels of attachment insecurity;
- ED Examination Questionnaire 6.0 (EDE-Q) (Calugi et al., 2016; Fairburn, 2008), for the assessment of ED-specific psychopathology. It comprises a total score (Cronbach's α in the present sample = 0.97) and four subscales measuring different features of the ED psychopathological core: dietary restraint, eating concern, weight concern, and shape concern;
- Body uneasiness test-A (BUT-A) (Cuzzolaro et al., 2006) for the evaluation of body uneasiness. It consists of 34 items and provides 5 subscales: weight phobia, body image concern, avoidance, compulsive self-monitoring and depersonalization. A total score (Global Severity Index, GSI) can be obtained by averaging the scores of all items; this score showed excellent reliability in the present study (Cronbach's $\alpha = 0.98$).

The same questionnaires, except ECR-R, were re-administered at T1.

2.3 | Treatment

Patients were treated in a multidisciplinary environment and provided at least 40 individual CBT-E sessions over the treatment period (Fairburn, 2008), delivered by nine therapists with clinical experience in the field of EDs and who had been trained in CBT and CBT-E. All patients were treated with the broad form of CBT-E, including all core modules on ED psychopathology and one or more additional modules on maintaining mechanisms (such as mood intolerance, clinical perfectionism, low self-esteem, interpersonal difficulties). Sessions were initially administered weekly or twice a week, while in the last phase they were scheduled with a frequency of one every 2 or 3 weeks

depending on individual needs. The implementation of CBT-E in all patients and treatment adherence were discussed in weekly team meetings. All therapists received weekly group supervision from a psychiatrist experienced in CBT-E. Moreover, patients were regularly evaluated by dietitians, psychiatrists and, if required, internal medicine physicians. These interventions were part of the clinical routine and were not influenced by the enrollment in the present study. On average, treatment lasted 48 weeks, with a median of 43 psychotherapy sessions (range: 40–51). Patients who missed three or more consecutive sessions were considered dropouts.

2.4 | Statistics

Sociodemographic and clinical characteristics of the sample were reported as means and standard deviations. BMI-adjusted Analysis of Covariance (ANCOVA) was performed to compare treatment completers versus noncompleters. Longitudinal changes of BMI and clinical measurements in patients were investigated using linear mixed models with random intercepts.

Structural equation modeling (SEM) analysis was performed to examine attachment style and the evolution of ED-specific psychopathology and body uneasiness from baseline to follow-up among

patients. In order to take into account the complex interplay between ED-specific psychopathology and body uneasiness over time, a bivariate latent change score modeling (LCSM) approach was used (McArdle, 2009), a technique for modeling the repeated-measures longitudinal variation of a dimension as a latent variable, called LCS. This was applied to longitudinal variations of both EDE-Q Total Score and BUT-A GSI within the same model in order to obtain two LCSs (Δ EDE-Q and Δ BUT-A, respectively), which captured the respective changes over time. In this setup, LCSs intercepts represent the amount of variation over time that is fixed (i.e., independent of other variables), whereas the proportional variation with respect to the baseline value can be obtained by regressing a LCS on its respective baseline variable (autoregressive effect). All fixed (α coefficients) and proportional (β coefficients) longitudinal effects for both latent variables were included in the initial model. Using the LCSM technique, longitudinal changes (measured by the LCSs) can be regressed on other variables, in order to investigate whether external factors can influence the variation over time. Cross-lagged effects (i.e., the effect of baseline values of a variable on the longitudinal change of another variable) were investigated in both directions (γ effects: EDE-Q_{T0} \rightarrow Δ BUT-A and BUT-A_{T0} \rightarrow Δ EDE-Q). Regarding adult attachment style, total baseline EDE-Q and BUT-A scores were regressed on both ECR scores (ζ and η coefficients), as well as the latent

TABLE 1 Sociodemographic and clinical characteristics of the sample at T0 and T1. Results of longitudinal analysis are reported using age and BMI-adjusted unstandardized coefficients

	ED patients T0 (n = 185)	ED patients T1 (n = 123)	Time effect (b)	Cohen's d
Age (years)	27.19 \pm 11.19	—	—	—
Education (years)	14.85 \pm 2.12	—	—	—
Age of onset (years)	17.68 \pm 5.21	—	—	—
BMI (kg/m ²)	19.67 \pm 6.03	20.17 \pm 4.86	0.74**	0.29
Eating Disorder Examination Questionnaire				
Restraint	3.30 \pm 1.94	2.16 \pm 1.81	−1.31***	−0.71
Eating concern	2.97 \pm 1.66	1.92 \pm 1.62	−1.16***	−0.64
Weight concern	3.48 \pm 1.77	2.62 \pm 1.88	−0.97***	−0.56
Shape concern	3.84 \pm 1.85	3.01 \pm 1.94	−0.94***	−0.52
Total score	3.40 \pm 1.62	2.42 \pm 1.69	−1.10***	−0.71
Body uneasiness test-A				
Weight Phobia	3.09 \pm 1.35	2.57 \pm 1.35	−0.66***	−0.64
Body Image Concern	2.83 \pm 1.39	2.15 \pm 1.38	−0.75***	−0.60
Avoidance	1.87 \pm 1.34	1.51 \pm 1.22	−0.42***	−0.33
Compulsive Self-Monitoring	2.32 \pm 1.38	1.93 \pm 1.27	−0.46***	−0.41
Depersonalization	2.29 \pm 1.37	1.62 \pm 1.36	−0.73***	−0.53
GSI	2.55 \pm 1.21	2.01 \pm 1.22	−0.62***	−0.61
Experiences in close relationships—revised				
Avoidance	61.74 \pm 23.48	—	—	—
Anxiety	72.68 \pm 21.67	—	—	—

Note: The respective *p* values are reported as follows: **p* < .05, ***p* < .01, ****p* < .001.

Abbreviations: BMI, body mass index; ED, eating disorder; GSI, Global Severity Index.

Δ EDE-Q score ($\theta_{\text{EDE-Q}}$ and $\iota_{\text{EDE-Q}}$ coefficients). Given that only the longitudinal variation of ED psychopathology was expected to predict an improvement of body uneasiness (and not vice-versa), the cross-domain coupling effect was initially entered only in this direction ($\epsilon_{\text{BUT-A}}: \Delta\text{EDE-Q} \rightarrow \Delta\text{BUT-A}$), while the opposite was constrained to zero. For the same reason, the effects of ECR scores on $\Delta\text{BUT-A}$ were expected to be only indirect; therefore, direct effects ($\theta_{\text{BUT-A}}$ and $\iota_{\text{BUT-A}}$ coefficients) were constrained to zero. Baseline EDE-Q Total Score and BUT-A GSI were allowed to covary, as well as ECR Anxiety and Avoidance scores. To facilitate model convergence, all ECR scores were divided by 10: all parameters should be interpreted accordingly. Equations used for the initial model are reported in the Supplementary Materials.

All the assumptions mentioned above for the initial model were tested using nested-model comparisons (Grimm et al., 2016). Using this technique, it is possible to compare an initial model with a second model in which a previously constrained effect is freely estimated, or a previously freely estimated parameter is constrained. A statistically significant comparison between the two models, together with good model fit parameters, indicates that the more complex model (with fewer degrees of freedom) should be retained. Conversely, a nonsignificant comparison supports the retention of the simpler model.

Mediation analysis was conducted by computing bootstrapped 95% confidence intervals (CI) for all indirect effects, with 10,000 resamples; an indirect effect was considered statistically significant if its 95% CI did not include zero. Among the possible indirect effects in the hypothesized model, only those with the following criteria were considered and analyzed: one of ECR subscales as independent variable, one of LCSs as dependent variable, one or more among the cross-domain coupling effects (γ or ϵ effects) as mediation pathway, statistical significance of all the effects of the mediation pathway.

Heteroskedasticity-robust standard errors were computed for all SEM analyses using the Huber-White sandwich estimator, except for indirect effects. All available data (T0 and T1) were used for each model: missing data were handled using the full-information maximum likelihood (FIML) method (Enders & Bandalos, 2001). Model-data fit was tested computing the following goodness-of-fit indices: χ^2 test (should be nonsignificant), comparative fit index (CFI ≥ 0.95 for good fit), Tucker-Lewis Index (TLI ≥ 0.95 for good fit), Root Mean Square Error of Approximation (RMSEA ≤ 0.06 for good fit), Standardized Root Mean Square Residual (SRMR ≤ 0.08 for good fit) (Schreiber et al., 2006). The Bayes Information Criterion (BIC) was also computed for all models. In accordance with the transdiagnostic approach to EDs, which states that AN and BN share a common psychopathological core

TABLE 2 Results of nested model comparisons

Model		χ^2	DF	BIC	CFI	TLI	RMSEA	SRMR	$\Delta\chi^2$
Final model		2.20	3	2965.57	1.00	1.01	0.000	0.019	-
Unconstrained models									
1 \rightarrow $\Delta\text{BUT-A}$	$\alpha_{\text{BUT-A}} \neq 0$	0.37	2	2968.95	1.00	1.02	0.000	0.004	2.86
$\Delta\text{BUT-A} \rightarrow \Delta\text{EDE-Q}$	$\epsilon_{\text{EDE-Q}} \neq 0$	1.94	2	2970.51	1.00	1.00	0.000	0.015	0.23
$\text{ECR}_{\text{Anx}} \rightarrow \Delta\text{BUT-A}$	$\theta_{\text{BUT-A}} \neq 0$	0.17	2	2968.74	1.00	1.02	0.000	0.003	2.69
$\text{ECR}_{\text{Av}} \rightarrow \Delta\text{BUT-A}$	$\iota_{\text{BUT-A}} \neq 0$	1.00	2	2969.58	1.00	1.01	0.000	0.010	1.43
Constrained models									
1 \leftrightarrow $\Delta\text{EDE-Q}$	$\alpha_{\text{EDE-Q}} = 0$	13.22*	4	2971.38	0.98	0.94	0.112	0.082	13.55***
$\text{EDE-Q}_{\text{T0}} \leftrightarrow \Delta\text{EDE-Q}$	$\beta_{\text{EDE-Q}} = 0$	32.18***	4	2990.34	0.95	0.81	0.196	0.115	54.09***
$\text{BUT-A}_{\text{T0}} \leftrightarrow \Delta\text{BUT-A}$	$\beta_{\text{BUT-A}} = 0$	55.08***	4	3013.23	0.91	0.66	0.264	0.059	71.96***
$\text{BUT-A}_{\text{T0}} \leftrightarrow \Delta\text{EDE-Q}$	$\gamma_{\text{EDE-Q}} = 0$	6.97	4	2965.12	0.99	0.98	0.064	0.020	5.12*
$\text{EDE-Q}_{\text{T0}} \leftrightarrow \Delta\text{BUT-A}$	$\gamma_{\text{BUT-A}} = 0$	49.55***	4	3007.70	0.92	0.70	0.249	0.039	52.94***
$\Delta\text{EDE-Q} \leftrightarrow \Delta\text{BUT-A}$	$\epsilon_{\text{BUT-A}} = 0$	145.30***	4	3103.45	0.75	0.07	0.439	0.091	100.17***
$\text{ECR}_{\text{Anx}} \leftrightarrow \text{EDE-Q}_{\text{T0}}$	$\zeta_{\text{EDE-Q}} = 0$	18.44**	4	2976.60	0.97	0.91	0.140	0.080	15.63***
$\text{ECR}_{\text{Anx}} \leftrightarrow \text{BUT-A}_{\text{T0}}$	$\zeta_{\text{BUT-A}} = 0$	22.94***	4	2981.10	0.97	0.88	0.161	0.093	14.95***
$\text{ECR}_{\text{Av}} \leftrightarrow \text{EDE-Q}_{\text{T0}}$	$\eta_{\text{EDE-Q}} = 0$	16.19**	4	2974.35	0.98	0.92	0.129	0.075	16.06***
$\text{ECR}_{\text{Av}} \leftrightarrow \text{BUT-A}_{\text{T0}}$	$\eta_{\text{BUT-A}} = 0$	24.70***	4	2982.85	0.96	0.86	0.168	0.097	22.30***
$\text{ECR}_{\text{Anx}} \leftrightarrow \Delta\text{EDE-Q}$	$\theta_{\text{EDE-Q}} = 0$	12.09*	4	2970.25	0.99	0.95	0.105	0.058	7.34**
$\text{ECR}_{\text{Av}} \leftrightarrow \Delta\text{EDE-Q}$	$\iota_{\text{EDE-Q}} = 0$	6.40	4	2964.56	1.00	0.98	0.057	0.036	6.69**
$\text{COV}(\text{EDE-Q}_{\text{T0}}, \text{BUT-A}_{\text{T0}}) = 0$		176.62***	4	3134.77	0.70	-0.13	0.486	0.134	132.41***
$\text{COV}(\text{ECR}_{\text{Anx}}, \text{ECR}_{\text{Av}}) = 0$		10.67*	4	2968.82	0.99	0.96	0.095	0.065	6.94**

Note: The final model (first row) was used as a comparator for all analyses. For every nested model, the variation with respect to the final model is described in the first column. For every model, common goodness-of-fit measures are reported. * $p < .05$, ** $p < .01$, *** $p < .001$.

Abbreviations: BIC, Bayes Information Criterion; BUT-A, Body Uneasiness Test-A; CFI, Comparative Fit Index; cov, covariance; DF, degrees of freedom; ECR-R, Experiences in Close Relationships-Revised; EDE-Q, Eating Disorders Examination Questionnaire; RMSEA, Root Mean Square Error of Approximation; SRMR, Standardized Root Mean Square Residual; TLI, Tucker-Lewis Index.

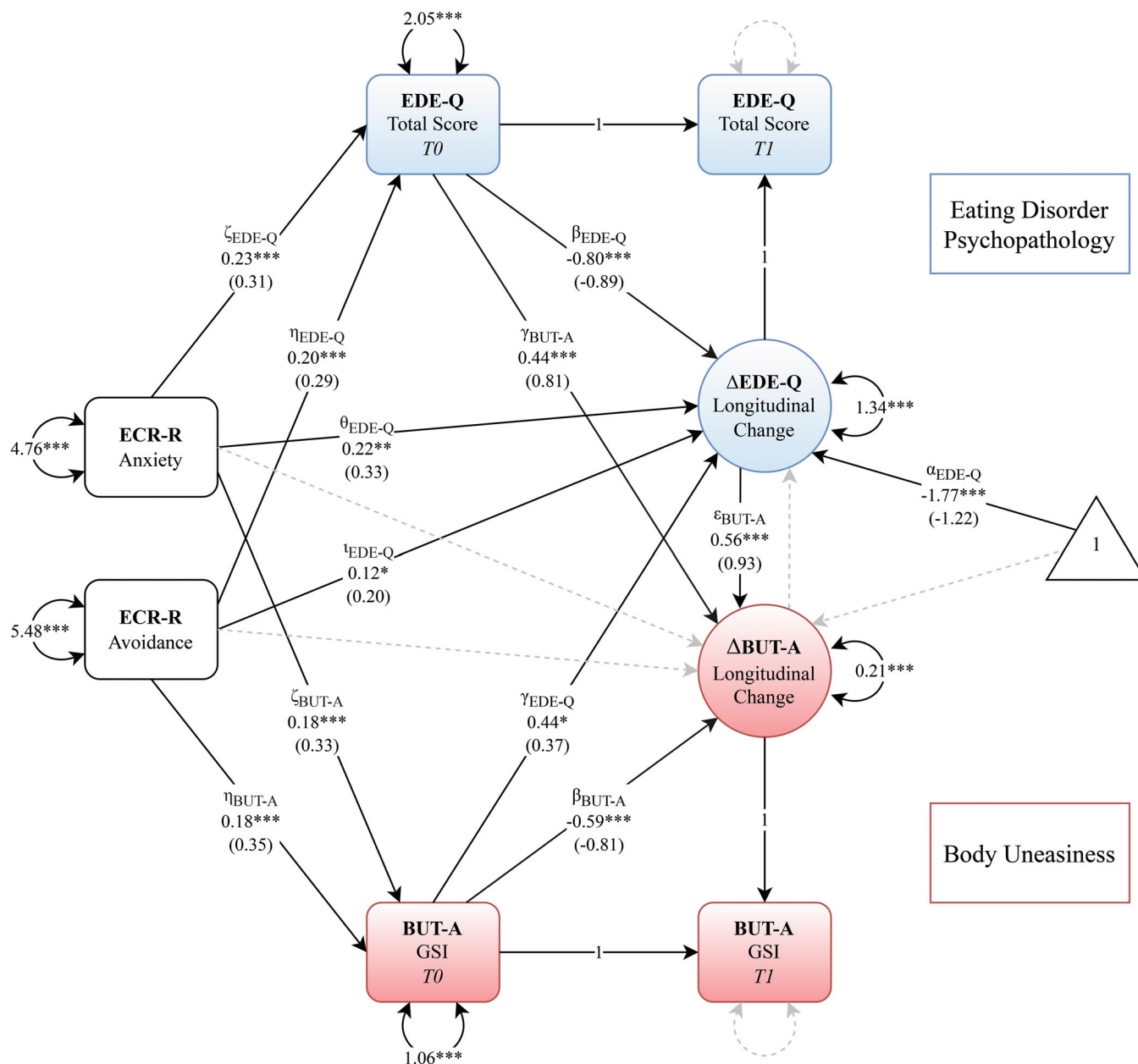


FIGURE 1 Final bivariate latent change score (LCS) model of the complex associations between insecure attachment, eating disorder psychopathology (in blue) and body uneasiness (in red). Observed variables are represented by rectangles, whereas circles represent latent variables. Single-headed arrows connecting variables represent regression effects, with their respective unstandardized and standardized (in parenthesis) coefficients reported as labels. Intercepts are reported as triangles with their respective arrows. Effects or variances that were constrained to zero are illustrated as gray arrows, whereas those constrained to one are shown using arrows labeled as “1.” Double-headed arrows represent variances. * $p < .05$, ** $p < .01$, *** $p < .001$. BUT-A, Body Uneasiness Test-A; ECR-R, Experiences in Close Relationships-Revised; EDE-Q, Eating Disorder Examination Questionnaire; GSI, Global Severity Index

represented by the overvaluation of body shapes and weight (Fairburn, 2008; Fairburn et al., 2003), and considering the well documented diagnostic cross-over between these disorders (Castellini et al., 2011; Castellini et al., 2018), analyses were carried out on the entire sample, regardless of diagnostic categorization.

Monte Carlo simulations determined that a sample size of 120 was sufficient in order to detect significant autoregressive and cross-domain coupling effects, assuming a standardized regression

coefficient of at least -0.50 for autoregressive effects and 0.30 for coupling effects, with a significance level of 0.05 and a power of 0.80 . For the power analysis, 1000 simulations were computed over the initial model structure; model parameters were estimated based on those reported in a previous study (Cassoli et al., 2021) and on preliminary data.

All analyses were performed using R Statistical Software version 4.1.2 (R Core Team, 2021) and the following packages: dplyr

(Wickham et al., 2020), lavaan (Rosseel, 2012), nlme (Pinheiro et al., 2020). Power analysis was conducted using pwrSEM (Wang & Rhemtulla, 2021).

3 | RESULTS

A total sample of 185 patients with AN ($n = 103$) or BN ($n = 82$) were enrolled for this study; their baseline data are reported in Table 1. Regarding employment status, 69 (37.3%) of the participants were students, whereas 65 (35.1%) had a job. Approximately half of the sample ($n = 92$, 49.7%) reported being in a relationship at T0. Among initially recruited patients, 47 (25.4%) discontinued treatment prematurely and were considered noncompleters, whereas 15 (8.1%) completed treatment but refused the follow-up assessment. No significant differences were found between treatment completers and non-completers on any of the baseline variables examined, including those regarding attachment style ($p > 0.05$). A total of 123 patients (70 with AN and 53 with BN) completed CBT-E treatment and underwent a follow-up assessment. After treatment, an amelioration of ED-specific psychopathology was observed, as well as lower levels of body uneasiness (Table 1). A total of 63 patients (51.2%) achieved at least partial remission at follow-up.

3.1 | LCS modeling

The initial model showed good model-data fit; however, the nonsignificant Δ BUT-A intercept ($\alpha_{\text{BUT-A}}$) did not support the existence of a fixed longitudinal variation of body uneasiness. This finding was corroborated by nested model comparison analysis, which confirmed that $\alpha_{\text{BUT-A}}$ did not significantly improve fitness. This effect was subsequently constrained to zero. The resulting model was further tested with respect to all coefficients; these nested model comparisons are reported in Table 2. Considering the alternative unconstrained models, no additional freely estimated parameter was able to significantly improve model fit (see “Unconstrained models” in Table 2). This confirmed the a priori assumption about the unidirectional nature of the longitudinal coupling between ED-specific psychopathology and body uneasiness, given that regressing Δ EDE-Q on Δ BUT-A led to no considerable model improvement (Table 2). On the contrary, constraining a free parameter to zero always led to a significantly poorer fit (see “Constrained models” in Table 2). Following these results, no further changes with respect to the initial model were necessary.

The final model showed excellent fit (Table 2); all regression coefficients and computed variances, which were all significantly different from zero, are illustrated in Figure 1. Indeed, LCSM confirmed the overall amelioration of ED psychopathology and body uneasiness at follow-up, with a fixed component for EDE-Q ($\alpha_{\text{EDE-Q}}$) and a proportional component for both (β coefficients, Figure 1). Furthermore, the model indicated not only that the improvement in body uneasiness was reduced with increasing baseline ED psychopathology ($\gamma_{\text{BUT-A}}$),

TABLE 3 Results of mediation analyses

Mediation pathway	Equation	Indirect effect [95% confidence interval]
$\text{ECR}_{\text{Anx}} \rightarrow \text{BUT-A}_{\text{T0}} \rightarrow \Delta \text{EDE-Q}$	$\zeta_{\text{BUT-A}}^* \gamma_{\text{EDE-Q}}$	0.08 (0.01, 0.19)
$\text{ECR}_{\text{Av}} \rightarrow \text{BUT-A}_{\text{T0}} \rightarrow \Delta \text{EDE-Q}$	$\eta_{\text{BUT-A}}^* \gamma_{\text{EDE-Q}}$	0.08 (0.01, 0.20)
$\text{ECR}_{\text{Anx}} \rightarrow \text{EDE-Q}_{\text{T0}} \rightarrow \Delta \text{BUT-A}$	$\zeta_{\text{EDE-Q}}^* \gamma_{\text{BUT-A}}$	0.10 (0.06, 0.16)
$\text{ECR}_{\text{Av}} \rightarrow \text{EDE-Q}_{\text{T0}} \rightarrow \Delta \text{BUT-A}$	$\eta_{\text{EDE-Q}}^* \gamma_{\text{BUT-A}}$	0.09 (0.05, 0.14)
$\text{ECR}_{\text{Anx}} \rightarrow \Delta \text{EDE-Q} \rightarrow \Delta \text{BUT-A}$	$\theta_{\text{EDE-Q}}^* \varepsilon_{\text{BUT-A}}$	0.12 (0.03, 0.22)
$\text{ECR}_{\text{Av}} \rightarrow \Delta \text{EDE-Q} \rightarrow \Delta \text{BUT-A}$	$\iota_{\text{EDE-Q}}^* \varepsilon_{\text{BUT-A}}$	0.07 (0.01, 0.14)
$\text{ECR}_{\text{Anx}} \rightarrow \text{BUT-A}_{\text{T0}} \rightarrow \Delta \text{EDE-Q} \rightarrow \Delta \text{BUT-A}$	$\zeta_{\text{BUT-A}}^* \gamma_{\text{EDE-Q}}^* \varepsilon_{\text{BUT-A}}$	0.05 (0.01, 0.11)
$\text{ECR}_{\text{Av}} \rightarrow \text{BUT-A}_{\text{T0}} \rightarrow \Delta \text{EDE-Q} \rightarrow \Delta \text{BUT-A}$	$\eta_{\text{BUT-A}}^* \gamma_{\text{EDE-Q}}^* \varepsilon_{\text{BUT-A}}$	0.05 (0.01, 0.11)

Abbreviations: BUT-A, Body Uneasiness Test-A; ECR-R, Experiences in Close Relationships-Revised; EDE-Q, Eating Disorders Examination Questionnaire.

but also that it was significantly predicted by the improvement of EDE-Q ($\varepsilon_{\text{BUT-A}}$) (Figure 1). Conversely, despite the evidence of a significant negative cross-lagged effect of baseline body uneasiness on Δ EDE-Q ($\gamma_{\text{EDE-Q}}$), the longitudinal improvement of ED psychopathology was not predicted by that of body uneasiness ($\varepsilon_{\text{EDE-Q}}$) (Figure 1).

Considering adult attachment styles, ECR scores related to insecure attachment correlated with higher levels of ED psychopathology and body uneasiness at baseline (ζ and η coefficients, Figure 1). Moreover, both anxious and avoidant styles predicted treatment outcomes, demonstrating worse improvements in terms of EDE-Q Total Scores both directly ($\theta_{\text{EDE-Q}}$ and $\iota_{\text{EDE-Q}}$ coefficients, Figure 1) and indirectly through higher baseline body uneasiness scores (Table 3). Insecure attachment styles also predicted less longitudinal amelioration of body uneasiness through multiple mediation pathways. Significant indirect effects through higher baseline EDE-Q scores were found (Table 3). Moreover, ECR-R Anxiety and Avoidance scores were associated with worse body uneasiness improvements at follow-up via lower EDE-Q improvements, both through single-mediator pathways and serial pathways via higher levels of BUT at baseline (Table 3). Finally, the overall total effects of insecure attachment domains on treatment outcomes were statistically significant, on both Δ EDE-Q (0.16, 95% CI [0.11, 0.25]) and Δ BUT-A (0.19, 95% CI [0.16, 0.36]).

4 | DISCUSSION

This is one of the few studies that investigated the role of attachment style in determining the outcome of CBT, and the first that evaluated the complex relationship between attachment style and the longitudinal trend of ED-specific psychopathology and body uneasiness in a sample of patients with AN and BN treated with CBT-E.

The overall improvement of ED symptomatology after treatment confirmed the well-known efficacy of CBT-E in patients with AN and BN (Atwood & Friedman, 2020; Dalle Grave et al., 2016). However, data regarding remission and dropout rates (51.2% and 25.4%, respectively) were unsatisfactory, as previously observed in the literature (Atwood & Friedman, 2020; Linardon et al., 2018), underscoring the importance of evaluating factors that predict treatment outcome in order to identify new potential targets of intervention.

4.1 | Association between attachment insecurity and worse longitudinal trend of ED psychopathology

Data at baseline confirmed the very well established association between attachment insecurity and ED symptoms (Kuipers & Bekker, 2012; O'Shaughnessy & Dallos, 2009; Tasca, 2019; Zachrisson & Skårderud, 2010), and longitudinal analysis showed that attachment anxiety and avoidance predicted higher levels of ED psychopathology at follow-up both directly and through the mediation of higher baseline levels of body uneasiness.

The role of negative body image as a possible nexus between attachment insecurity and ED symptoms is in line with what was previously reported by several cross-sectional studies in this field (Cortés-García et al., 2019). In particular, Tasca et al. (2006) showed that body dissatisfaction mediated the relationship between attachment insecurity and restrained eating in patients with EDs, and Koskina et al. (2010) demonstrated the role of body dissatisfaction as a mediator in the association of insecure anxious attachment with dietary symptoms and bulimia in undergraduate students. This result could be explained considering that subjects with high-attachment insecurity might be particularly vulnerable to the internalization of societal aesthetic standards for the purpose of obtaining social approval and acceptance (Bardone et al., 2000; Cole-Detke & Kobak, 1996a). When these objectives are not met, body dissatisfaction increases, potentially triggering and maintaining pathological eating behaviors. Furthermore, the association of higher baseline levels of body uneasiness with worse outcome confirms the very well-known role of negative body image as an important risk and perpetuating factor in EDs (Stice & Shaw, 2002).

The direct effect of attachment insecurity in maintaining ED symptoms could be explained considering that CBT-E does not address attachment issues as specific targets of intervention. In particular, it could be hypothesized that persistence of difficulties in emotion regulation might maintain ED psychopathology in insecurely attached patients treated with CBT-E (Cortés-García et al., 2019). In line with this hypothesis, a recent longitudinal study demonstrated that emotion dysregulation was the nexus linking early traumatic experiences and worse response to CBT-E in patients with AN (Cassoli et al., 2021). Considering the very well-known association between childhood trauma and attachment insecurity (Liotti, 2004; Mikulincer & Shaver, 2007), a similar mechanism might be involved in determining reduced treatment response in insecurely attached patients. Shaver and Mikulincer (Shaver & Mikulincer, 2002) theorized

that in the presence of attachment insecurity the so-called security-based emotion regulation strategies, which are aimed at alleviating distress through flexible and reality-attuned means, fail. Therefore, the individual is forced to adopt secondary emotion regulation strategies which can be classified in two different types, namely hyperactivating and deactivating ones, based on the appraisal of proximity seeking as a viable option or not, respectively. The adoption of hyperactivating strategies is a core aspect of attachment anxiety and consists in the enactment of very insistent and energetic efforts to obtain closeness, love, intimacy, and care, as this is the only way to obtain relief from negative emotions (Cassidy & Kobak, 1988; Mikulincer et al., 2003; Shaver & Mikulincer, 2002). On the other side, deactivating strategies characterize attachment avoidance, and consist in the inhibition of the need for support to avoid frustration caused by the unavailability of the attachment figure (Cassidy & Kobak, 1988; Mikulincer et al., 2003; Shaver & Mikulincer, 2002). Hyperactivating strategies might maintain ED psychopathology since the continuous monitoring of potential relational difficulties, as well as the intense fear of rejection and abandonment, might determine a generalized state of alarm and suffering only manageable through the enactment of pathological eating behaviors (Cortés-García et al., 2019). On the other side, considering that the pursuit of true self-reliance can never be entirely successful (Main, 1990), in individuals with deactivating emotion regulation strategies the excessive importance attributed to body shape and weight may serve as a way to refocus from attachment needs to more attainable goals (Cole-Detke & Kobak, 1996b). Finally, considering that the therapeutic relationship is first and foremost an interaction between human beings, high levels of attachment anxiety or avoidance and the consequent enactment of hyperactivating/deactivating emotion regulation strategies in the context of this relationship might menace therapeutic alliance and, as a consequence of this, treatment response (Skourteli & Lennie, 2010).

4.2 | Association between attachment insecurity and worse longitudinal trend of body uneasiness

The results of the present study showed that both attachment anxiety and avoidance maintained body uneasiness as an indirect effect of the persistence of higher levels of ED psychopathology. In other words, insecurely attached patients improved less after treatment in terms of ED psychopathology, which reduced improvement in terms of body image. Interestingly, for the first time these results showed that the association between the variation of ED psychopathology and that of body uneasiness was unidirectional, which means that a scarce improvement of ED psychopathology over time predicted lower amelioration of body uneasiness, but not vice versa, providing evidence regarding the mechanism through which CBT-E determines an improvement of body image. This finding could be explained in light of the cognitive-behavioral model of EDs according to which all ED symptoms, including negative body image, are maintained by the overvaluation of body shape and weight for self-esteem (Fairburn, 2008). Furthermore, it corroborates the hypothesis that

only patients who cognitively recover from the ED obtain the restoration of a positive relationship with one's body (Bachner-Melman et al., 2006; Bardone-Cone et al., 2010). In other words, these results highlighted that once the ED is entrenched in the beliefs, values and behaviors of a person, the restoration of healthy body image necessarily requires the erosion of the cognitive-behavioral symptoms of the disorder. Therefore, when the improvement of these symptoms is impaired, as in the case of patients with high levels of attachment insecurity, the recovery of healthy body image is impaired too.

4.3 | Final considerations and clinical implications

The association between attachment insecurity and worse treatment outcome confirmed what was previously observed for group therapies in patients with AN and BN (Illing et al., 2010; Keating et al., 2015; Tasca et al., 2004). Furthermore, these results are in line with what was reported by Cassioli et al. (Cassioli et al., 2022) concerning the association between avoidant attachment and worse sexual outcome in patients with AN treated with CBT-E, which is relevant given the profound association between sexuality and bodily experiences in patients with EDs (Castellini et al., 2019; Castellini et al., 2020; Castellini et al., 2022). However, these findings contrast with those obtained in the study performed by Daniel et al. (Daniel et al., 2016) in a sample of patients with BN treated with individual CBT, where no association was found between attachment insecurity and outcome. However, this negative result could be explained by the very limited sample size. Furthermore, the use of a categorical approach for the evaluation of adult attachment might have limited the statistical power (Fraley et al., 2015). The application of a dimensional approach to the study of attachment style represents a strength of the present study considering that more and more evidence supports the hypothesis that adult attachment should be conceptualized as the resultant of two continuous dimensions represented by attachment anxiety and avoidance rather than in the form of distinct categories (Fraley et al., 2015; Mikulincer et al., 2003).

Overall, the results of the present study suggest that an integration of CBT-E with modules aimed at addressing dysfunctional attachment strategies would be of considerable clinical interest for patients with high levels of attachment insecurity. Indeed, the cognitive-behavioral approach emphasizes the over-evaluation of weight and shape as the core maintaining mechanism of these disorders, but leaves out other important factors, including developmental ones, even in its extended version (Fairburn, 2008). Consequently, the role of dysfunctional attachment relationships and of the internalization of maladaptive schemas of the self and others in maintaining these disorders is neglected. It is possible that, in the presence of high levels of attachment insecurity, this approach might direct the focus of treatment down the wrong path. Therefore, several improvements that embrace a developmental perspective should be considered. For example, the integration of techniques aimed at reprocessing memories of dysfunctional attachment relationships, such as Eye Movement Desensitization and Reprocessing Therapy (Shapiro, 2018), and

satisfying frustrated attachment needs, such as imagery rescripting from Schema Therapy (Young et al., 2003), might ameliorate treatment outcomes (Balbo et al., 2017; Parnell, 2013; Pugh, 2015; Wesselmann et al., 2012; Zaccagnino, Civilotti, et al., 2017; Zaccagnino, Cussino, et al., 2017). Furthermore, considering the close relationship between insecure attachment and emotional dysregulation, a dimension that is not fully covered in the current CBT-E model (Trompeter et al., 2021), additional interventions to stabilize the most compromised patients in the initial stages of psychotherapy could facilitate subsequent work and improve adherence and outcome. In this context, the integration of CBT-E with specific interventions aimed at targeting emotion dysregulation, such as the skills training of Dialectical Behavioral Therapy, could be beneficial (Linehan, 1987; Lynch et al., 2013; Trompeter et al., 2021).

4.4 | Limitations

The results of the present study should be interpreted in light of some limitations. First of all, the sample size was relatively small. The study was not sufficiently powered to investigate any differences between diagnostic groups with multi-group SEM analyses, or to highlight predictors of dropout. Larger sample studies are needed to confirm the results and better investigate these secondary outcomes. Secondly, the duration of follow-up was limited; the addition of more time points would allow the evaluation of the role of attachment style as a predictor of long-term relapses. Finally, since the time periods for the definition of partial and complete remission from EDs are not specified in the DSM-5, the criteria used in the present study were chosen based on the existing literature.

5 | CONCLUSIONS

In conclusion, the present study demonstrated that attachment insecurity predicts worse longitudinal trends of ED psychopathology and body uneasiness in patients with AN and BN treated with CBT-E. In particular, it showed that high levels of attachment anxiety or avoidance maintained ED psychopathology both directly and through the mediating effect of higher baseline levels of body uneasiness. Furthermore, because of the impaired amelioration of ED psychopathology, insecure attachment had an indirect effect on maintaining body uneasiness over time. The unidirectional coupling between the longitudinal trend of ED psychopathology and that of body uneasiness supports the cognitive-behavioral model, according to which the therapeutic work aimed at targeting pathological eating behaviors and the excessive importance attributed to body shape and weight is fundamental to obtain an amelioration in terms of body image. On the other hand, the role of attachment style as a predictor of treatment outcome suggests the need for an integration of the cognitive-behavioral conceptualization of EDs with a developmental perspective that takes into account attachment-related issues, including emotion dysregulation and the presence of adverse childhood experiences.

AUTHOR CONTRIBUTIONS

Eleonora Rossi: Conceptualization; data curation; investigation; methodology; project administration; validation; visualization; writing – original draft; writing – review and editing. **Emanuele Cassioli:** Conceptualization; data curation; formal analysis; investigation; methodology; project administration; software; validation; visualization; writing – original draft; writing – review and editing. **Michela Martelli:** Data curation; investigation; writing – original draft. **Giulia Melani:** Data curation; investigation; writing – original draft. **Vivienne M Hazzard:** Supervision; validation; writing – review and editing. **Ross D Crosby:** Supervision; validation; writing – review and editing. **Stephen Wonderlich:** Supervision; validation; writing – review and editing. **Valdo Ricca:** Conceptualization; project administration; resources; supervision; validation; writing – review and editing. **Giovanni Castellini:** Conceptualization; data curation; investigation; methodology; project administration; resources; supervision; validation; visualization; writing – review and editing.

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The authors have no conflict to declare.

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Availability of data, materials, and code: The data underlying this article will be shared on reasonable request to the corresponding author.

ORCID

Eleonora Rossi  <https://orcid.org/0000-0003-4755-3879>

Emanuele Cassioli  <https://orcid.org/0000-0003-3623-7096>

Vivienne M. Hazzard  <https://orcid.org/0000-0003-3933-1766>

Stephen A. Wonderlich  <https://orcid.org/0000-0002-0659-153X>

Giovanni Castellini  <https://orcid.org/0000-0003-1265-491X>

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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