


COVID-19 pandemic impact among adolescents with eating disorders referred to Italian psychiatric unit

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Abstract

Problem: The COVID-19 pandemic has triggered or exacerbated eating disorders (EDs), especially in adolescents. This study examined the prevalence of admissions of patients with EDs at the Child and Adolescent Psychiatry Unit from the pre-COVID-19 pandemic to March 2023 and explored the differences in dimensions of ED's symptomatology according to the year of access.

Methods: We included 174 children and adolescents, 94.3% females and 5.7% males, with a diagnosis of ED ($M_{age} = 14.87$; $SD = 1.72$). The *Eating Disorder Inventory-3* (EDI-3), the *Body Uneasiness Test* (BUT) and *Youth Self Report ASEBA* (YSR) were assessed. A one-way analysis of variance test was performed.

Findings: EDs' hospitalization prevalence was higher in the years 2020 and 2021 compared to pre-COVID-19 and the year 2022. Considering the ED psychopathology (EDI-3), findings showed a higher score in the dimension of the push to thinness, body dissatisfaction, asceticism, and fear of maturity in the year 2021 compared to pre-pandemic. Regarding the discomfort related to the image of one's own body (BUT), results showed an increase in the global severity index in the year 2022 compared to pre-pandemic and in weight phobia in the year 2021 compared to the year 2020. Concerning the internalizing symptoms (YSR), a tendency was found for withdrawal/depression, with higher levels in the year 2022 compared to the year 2020.

Conclusions: Our study highlighted the increase of different types of EDs symptomatology related to concerns about weight, especially 2 and 3 years after the outbreak of the pandemic, on which the literature is still scarce, especially in the Italian context.

KEYWORDS

COVID-19, eating disorders, mental health, pandemic lockdown, psychiatry

Pietro Cappelletto and Lisa De Luca contributed equally to the manuscript.

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1 | INTRODUCTION

The global COVID-19 pandemic declared on the 11th of March 2020 (World Health Organization, 2019), has led to great consequences on individuals' life (Barlow, 2021; Kasiak et al., 2022). The several restrictions imposed, the social distancing policies and the alteration of normal routines have had negative effects on both the physical and mental health of adults (Holmes et al., 2020; Pierce et al., 2020; Xiong et al., 2020) as well as of adolescents (Hoyt et al., 2021; Rogers et al., 2021). Specifically, the pandemic impacted mental distress worsening feelings of anxiety, loneliness, helpfulness, and anger (Carvalho Aguiar Melo & de Sousa Soares, 2020; Giel et al., 2021). These effects have been also even greater for people who were already vulnerable to biological or psychosocial stressors (Fiorillo et al., 2020), leading to new psychiatric diagnoses (Torales et al., 2020) or leading to worsening of symptoms in people who previously showed mental health problems (Fernández-Aranda et al., 2020; Iob et al., 2020).

Given the unique developmental and transition period of adolescence, youth may have been more affected by the stressful life events related to the pandemic, exacerbating previous mental health problems. In particular, several data suggested that the COVID-19 pandemic has triggered or exacerbated eating disorders (EDs), putting them at greater risk of worsening symptoms (Cooper et al., 2022; Baenas et al., 2021; Miniati et al., 2021; Monteleone, et al., 2021; Zipfel et al., 2022). Indeed, individuals with EDs represent a vulnerable and sensitive population, particularly during a period such as the pandemic in which ED symptoms could have been exacerbated by the alteration of daily activities and habits (e.g., activity and food) (Rodgers et al., 2020; Touyz et al., 2020) as well as the limitation of accessing routine healthcare (Touyz et al., 2020; Weissman et al., 2020).

A study conducted on Italian children and adolescents (Giacomini et al., 2022) comparing the hospitalization that occurred in 2020–2021 with 2018–2019, showed an increase in the total proportion of EDs admissions from 2020 to 2021 (from 13.9% to 22.2%). Other studies conducted exclusively on children and adolescents showed an increase in the new diagnoses and higher rate of new incidence and hospitalizations for EDs (i.e., anorexia) during the first wave of the COVID-19 pandemic, from an average of 24 cases per month to 40 cases per month (Lin et al., 2021; Otto et al., 2021; Toulany et al., 2022). In addition, youths reported an increase in medical admission through emergency department visits (i.e., an increase of 11%; Meier et al., 2022), an increased rate of comorbidity for mental health conditions (Feldman et al., 2022), and a worsening of the EDs' symptomatology (Spigel et al., 2021). Several studies highlighted an increase in the associations between EDs and a worsening of related symptomatology, albeit with mixed results. A study conducted by Schleg and colleagues (2020) among adolescents and adults that suffered from anorexia nervosa found that up to 70% of patients described that eating, shape, and weight concerns, drive for physical activity, loneliness, sadness, and inner restlessness increased during the pandemic period. Another UK survey, among

patients with a current or past diagnosis of EDs compared to those with other mental health and developmental disorders, confirmed greater difficulties in regulating eating, an increasing preoccupation related to food, exercise thoughts, and concern about appearance (Robertson et al., 2021). In another study, the increase in EDs-related symptoms was documented through the questionnaire "Eating Disorder Inventory-3" (EDI-3) subscale administered to a group of students with a history of EDs (Meda et al., 2021).

Food access limitation during the pandemic represented a risk factor for both triggering and exacerbating EDs, and restrictions in healthcare facilities contributed to an increase in anxiety and a decrease in treatment compliance (Miniati et al., 2021; Rodgers et al., 2020). Indeed, patients with EDs reported, during the pandemic, a worsening of mental health symptoms such as loneliness, depression, anxiety, stress, emotion dysregulation as well as mood disorders, suicidal ideation, and self-injury behavior (Devoe et al., 2022; Haghshomar et al., 2022; Meier et al., 2022; Schleg et al., 2020). Conversely, the study of Meda and colleagues (2021) involving a sample of young adults did not find a clinically significant worsening of these related symptoms, while approximately 6% of students developed depressive symptoms, with aggravation during the lockdown and relief of symptoms in the following months. In addition, a study conducted exclusively on a small sample of children and adolescents with EDs, comparing patients assessed in 2019 versus 2020 with the Revised children's anxiety and depression scale (RCADS), did not find an increase in anxiety and depressive symptoms (Spettigue et al., 2021).

Although many studies have highlighted the impact of the pandemic on EDs, also leading to an increase in symptoms, to date there are few studies conducted on Italian samples. Specifically, most of the existing studies have analyzed the association between the effects of the pandemic and eating behavior in clinical samples of the adult population (e.g., Colleluori et al., 2021; Monteleone et al., 2021; Nisticò et al., 2021), while there only a few specific studies conducted on a sample of adolescents and children (Giacomini et al., 2022). Moreover, given the ever-changing restrictions related to pandemics, it would be important to analyze the impact of the pandemic on ED patients during the different years of the health emergency. Specifically, in the Italian context, the pandemic has been characterized by different trends across 2 years. The year 2020 was characterized by the lockdown and very restrictive measures with numerous limitations at both a social, scholastic, occupational, and health level. The year 2021 was characterized by a slow and limited recovery of routines with different dispositions according to different cities and regions with an easing of measures towards the end of the year. The year 2022 was characterized by an almost total easing of the restrictive measures until the end of the health emergency in April.

Given these premises, the aim of our study is to evaluate in a sample of youths with EDs the differences in the levels of ED psychopathology, the discomfort related to the image of one's own body, and internalizing symptoms according to the year of access pre and during the pandemic.

1.1 | The current study

This study aimed to examine the prevalence of admissions of patients with a diagnosis of ED who accessed our Child and Adolescent Psychiatry Unit (CAPU) from the pre-COVID-19 pandemic to March 2023. Additionally, this study examined whether the different dimensions of ED's symptomatology (i.e., ED psychopathology, the discomfort related to the image of one's own body, and internalizing symptoms) significantly differed among the 4 years of access to CAPU (i.e., from 9th March 2019 to 8th March 2020, from 9th March 2020 to 8th March 2021, from 9th March 2021 to 8th March 2022, and from 9th March 2022 to 8th March 2023).

2 | METHOD

2.1 | Participants

The current retrospective study included a clinical sample of 174 children and adolescents with a primary diagnosis of ED, 164 (94.3%) females and 10 (5.7%) males, who accessed the CAPU of our Hospital from March 2019 to March 2023. The age of patients who accessed was ranged between 9 and 18 years old ($M_{\text{age}} = 14.87$ years, $SD = 1.72$). Regarding the ED diagnosis, 166 patients (95.4%) received the diagnosis of anorexia nervosa (AN), 6 (3.4%) received the diagnosis of bulimia nervosa (BN), and 2 (1.1%) received the diagnosis of binge eating (BE).

2.2 | Measures

EDs were assessed through the EDI-3 (Garner, 2004). The EDI-3 is a self-report questionnaire composed of 91 items rated on a 6-point Likert scale ranging from 0 ("never") to 5 ("always") that assess the presence of ED psychopathology and related features. The scale assessed twelve primary dimensions divided into the ED Risk Scales (i.e., Push to Thinness, Bulimia, and Body Dissatisfaction) and the Psychological Scale (i.e., Low Self-Esteem, Personal Alienation, Interpersonal Alienation, Interoceptive Deficits, Emotional Dysregulation, Perfectionism, Asceticism, Fear of Maturity, and Interpersonal Problems). Also reported are six composites' scores (i.e., Eating Disorder Risk, Ineffectiveness, Interpersonal Problems, Affective Problems, Overcontrol, and General Psychological Maladjustment). Higher scores referred to higher levels of EDs. The reported score was expressed in percentiles. In this study, the ED Risk Scales and the Psychological Scales were used.

The *Body Uneasiness* was assessed through the *Body Uneasiness Test* (BUT; Cuzzolaro et al., 2006). This measure is a self-report multidimensional questionnaire that assessed the degree of severity related to one's body image (BUT A) and the distress related to specific parts of the body and sensory manifestations (BUT B). Specifically, BUT A is composed of 34 items rated on a 5-point Likert scale from 0 ("never") to 5 ("always") that assess Global Severity Index (GSI), Weight Phobia (WP), Body Image Concerns (BIC), Avoidance (A), Compulsive Self-Monitoring (CSM), and Depersonalization (D).

BUT B is composed of 37 items rated on a 5-point Likert scale from 0 ("never") to 5 ("always") that assess Positive Symptom Total (PST) and Positive Symptom Distress Index (PSDI). In this study, we used a continuous score. The scale has good psychometrical properties and internal consistency (Cuzzolaro et al., 2006).

Symptomatology was assessed through the *Youth Self Report ASEBA* (YSR; Achenbach & Rescorla, 2001). The version for youth was composed of 112 items rated on a 3-point Likert scale from 0 ("not truer") to 2 ("very true"). The measure assesses a range of emotional and behavioral problems experienced in the past 6 months. The YSR included eight syndrome scales grouped into Internalizing symptoms (Anxious/Depressed, Withdrawal/Depressed, Somatic Complaints), Social Problems, Thought Problems, Attention Problems, and Externalizing symptoms (Rule-Breaking Behavior and Aggressive Behavior). The raw score was used in this study. According to the study characteristics we considered in the analysis only the internalizing symptoms. In fact, the strong association between ED and internalizing symptoms such as anxiety and depression are highlighted in the literature (e.g., Thomas et al., 2021).

2.3 | Procedure and analysis of data

The variables were extrapolated directly from the clinical records, entered in a computerized evaluation matrix, and then imported into the software SPSS-PSW for statistical analysis. To examine the prevalence of ED psychopathology, the discomfort related to the image of one's own body, and internalizing symptoms, descriptive frequencies and percentages were used.

Specifically, following both the categorization provided by the National Institute of Statistics (ISTAT; in which the number of cases and deaths were measured according to the year) and the timing of the onset of the COVID-19 pandemic in Italy (i.e., the lockdown was officially declared on 9th March 2020) the frequency was examined according to the year of access to the Hospital calculated from 9 March. More specifically we included four different periods: from 9th March 2019 to 8th March 2020, from 9th March 2020 to 8th March 2021, from 9th March 2021 to 8th March 2022, and from 9th March 2022 to 8th March 2023. Specifically, to simplify, we will refer to the first period as the pre-pandemic period, the second as the year 2020, the third as the year 2021, and the fourth as the year 2022.

The one-way analysis of variance (ANOVA) test was used to analyze the differences in mean values on rating scale scores according to the 4 years of access for the three different measures used: EDI, YSR, and BUT. The results were presented separately for the three-scale analyzed.

3 | RESULTS

3.1 | Prevalence of hospitalization to CAPU

Figure 1 displays the number of admissions and the related percentage of patients with EDs according to the year of access.

Regarding the year of admission to the hospital, 38 (21.8%) patients accessed between 9th March 2019 and 8th March 2020, 54 (31%) accessed from 9th March 2020 to 8th March 2021, 51 (29.4%) accessed from 9th March 2021 to 8th March 2022, and 31 (17.8%) from 9th March 2022 to 8th March 2023. Specifically, regarding the distribution of the different types of ED according to the years of access, from 9th March 2019 to 8th March 2020, 32 (84.2%) patients had a diagnosis of AN, 5 (13.2%) had a diagnosis of BN, and 1 (2.6%) a diagnosis of BE. From 9th March 2020 to 8th March 2021, when the COVID-19 pandemic broke down, 53 (98.1%) patients presented the diagnosis of AN whereas 1 (1.9%) had BN. From 9th March 2021 to 8th March 2022, 50 (98%) patients had AN, whereas 1 (2%) had BN, and finally, from 9th March 2022 to 8th March 2023, when the COVID-19 emergency ended, 31 (100%) patients had a diagnosis of AN. Sociodemographic and psychopathological data were coded from medical records.

3.2 | Differences in EDs symptomatology according to the year of access to CAPU

The differences in mean values on rating scale scores were examined in relation to psychopathology (EDI), discomfort related to the image of one's own body (BUT), and internalizing symptoms (YSR) according to the 4 years of access.

3.2.1 | ED inventory

As displayed in Table 1, the ANOVA results showed statistically significant differences between the years of access for the dimension related to push to thinness ($F_{(3,127)} = 3.205$; $p = 0.026$), body dissatisfaction ($F_{(3,126)} = 3.277$; $p = 0.023$), asceticism ($F_{(3,125)} = 2.731$; $p = 0.047$), and fear of maturity ($F_{(3,125)} = 2.702$; $p = 0.048$). Specifically, patients who accessed in the year 2021 presented higher push to

thinness scores ($M = 86.46$; $SD = 17.38$) than patients who accessed during the pre-COVID-19 period ($M = 69.63$; $SD = 29.50$). Likewise, patients who accessed in the year 2021 presented higher body dissatisfaction scores ($M = 82.45$; $SD = 14.32$) than patients who accessed during the pre-COVID-19 period ($M = 64.23$; $SD = 26.05$), higher levels of asceticism ($M = 84.38$; $SD = 14.38$) than the pre-COVID-19 period ($M = 65.67$; $SD = 34.35$), and finally higher fear to maturity scores ($M = 71.66$; $SD = 20.56$) than patients who accessed during the pre-COVID-19 period ($M = 53.83$; $SD = 31.36$). Furthermore, the results showed a tendency towards significance for personal alienation ($F_{(3,126)} = 2.616$; $p = 0.054$) with higher levels in patients who accessed in the year 2022 ($M = 80.26$; $SD = 21.88$) compared to those who accessed in the pre-COVID-19 period ($M = 65.97$; $SD = 31.69$). No statistically significant differences were found for the other dimensions considered (bulimia nervosa; low self-esteem; interpersonal alienation; interceptive deficits; emotional dysregulation; perfectionism).

3.2.2 | The body uneasiness test

The ANOVA results showed statistically significant differences between the years of access for global severity index ($F_{(3,93)} = 3.223$; $p = 0.026$), and for weight phobia ($F_{(3,102)} = 3.901$; $p = 0.011$). Specifically, patients who accessed the CAPU in the year 2022 showed higher score in the Global Severity Index ($M = 3.18$; $SD = 0.98$) compared to those who accessed in the pre-COVID-19 period ($M = 2.31$; $SD = 1.32$). Additionally, patients who accessed the CAPU in the year 2021 showed higher levels of weight phobia ($M = 3.96$; $SD = 0.84$) compared to those who accessed in the year 2020 ($M = 2.87$; $SD = 1.67$). Furthermore, the results showed a tendency towards significance for Positive Symptom Total ($F_{(3,99)} = 2.618$; $p = 0.055$) with higher levels in patients who accessed in the year 2022 ($M = 25.39$; $SD = 9.25$) compared to those who accessed in the year 2020 ($M = 17.83$; $SD = 12.68$). No statistically significant differences were found for the other dimensions

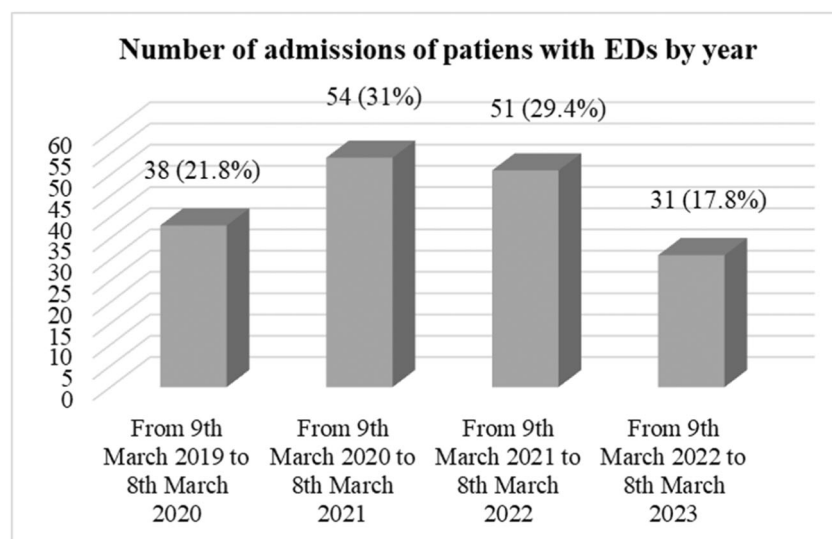


FIGURE 1 Distribution of ED according to the years of access. ED, eating disorder.

TABLE 1 Descriptive results for Eating Disorder Risk Scale and Psychological Scale.

	Year of access	N	M (SD)	F, p
PT	From 9th March 2019 to 8th March 2020	30	69.63 (29.50)	$F_{(3,127)} = 3.205, p = 0.026$
	From 9th March 2020 to 8th March 2021	39	75.13 (32.36)	
	From 9th March 2021 to 8th March 2022	39	86.46 (17.38)	
	From 9th March 2022 to 8th March 2023	23	84.61 (13.81)	
BN	From 9th March 2019 to 8th March 2020	30	52.87 (34.69)	$F_{(3,125)} = 0.123, p = 0.946$
	From 9th March 2020 to 8th March 2021	39	55.54 (30.78)	
	From 9th March 2021 to 8th March 2022	37	53.49 (26.65)	
	From 9th March 2022 to 8th March 2023	23	50.83 (28.87)	
BD	From 9th March 2019 to 8th March 2020	30	64.23 (26.05)	$F_{(3,126)} = 3.277, p = 0.023$
	From 9th March 2020 to 8th March 2021	39	70.72 (30.44)	
	From 9th March 2021 to 8th March 2022	38	82.45 (14.32)	
	From 9th March 2022 to 8th March 2023	23	73.48 (24.47)	
LSE	From 9th March 2019 to 8th March 2020	30	66.27 (31.09)	$F_{(3,126)} = 1.668, p = 0.177$
	From 9th March 2020 to 8th March 2021	39	68.44 (33.27)	
	From 9th March 2021 to 8th March 2022	38	78.74 (17.45)	
	From 9th March 2022 to 8th March 2023	23	76.52 (22.12)	
PA	From 9th March 2019 to 8th March 2020	30	65.97 (31.69)	$F_{(3,126)} = 2.616, p = 0.054$
	From 9th March 2020 to 8th March 2021	39	67.82 (30.69)	
	From 9th March 2021 to 8th March 2022	38	79.50 (16.79)	
	From 9th March 2022 to 8th March 2023	23	80.26 (21.88)	
IA	From 9th March 2019 to 8th March 2020	30	62.03 (33.98)	$F_{(3,125)} = 1.408, p = 0.244$
	From 9th March 2020 to 8th March 2021	39	59.95 (31.96)	
	From 9th March 2021 to 8th March 2022	37	71.95 (27.39)	
	From 9th March 2022 to 8th March 2023	23	71.61 (27.84)	
ID	From 9th March 2019 to 8th March 2020	30	72.40 (24.29)	$F_{(3,127)} = 1.893, p = 0.134$
	From 9th March 2020 to 8th March 2021	39	74.72 (30.82)	
	From 9th March 2021 to 8th March 2022	39	83.79 (19.07)	
	From 9th March 2022 to 8th March 2023	23	83.00 (15.39)	
EDys	From 9th March 2019 to 8th March 2020	30	60.97 (33.67)	$F_{(3,127)} = 1.848, p = 0.142$
	From 9th March 2020 to 8th March 2021	39	63.21 (34.02)	
	From 9th March 2021 to 8th March 2022	39	75.74 (20.26)	
	From 9th March 2022 to 8th March 2023	23	68.09 (25.35)	
P	From 9th March 2019 to 8th March 2020	30	54.17 (34.75)	$F_{(3,123)} = 1.084, p = 0.359$
	From 9th March 2020 to 8th March 2021	39	53.00 (33.09)	
	From 9th March 2021 to 8th March 2022	36	62.25 (25.30)	
	From 9th March 2022 to 8th March 2023	22	64.55 (26.44)	
A	From 9th March 2019 to 8th March 2020	30	65.67 (34.35)	$F_{(3,125)} = 2.731, p = 0.047$
	From 9th March 2020 to 8th March 2021	39	72.05 (31.50)	
	From 9th March 2021 to 8th March 2022	37	84.38 (14.38)	

(Continues)

TABLE 1 (Continued)

	Year of access	N	M (SD)	F, p
	From 9th March 2022 to 8th March 2023	23	73.70 (26.30)	
FM	From 9th March 2019 to 8th March 2020	30	53.83 (31.36)	$F_{(3,125)} = 2.702, p = 0.048$
	From 9th March 2020 to 8th March 2021	38	67.34 (26.11)	
	From 9th March 2021 to 8th March 2022	38	71.66 (20.56)	
	From 9th March 2022 to 8th March 2023	23	66.70 (28.82)	

Note: In bold are reported the significant difference between the year of access.

Abbreviations: A, asceticism; BD, body dissatisfaction; BN, bulimia nervosa; EDys, emotional dysregulation; FM, fear of maturity; IA, interpersonal alienation; ID, interoceptive deficits; LSE, low self-esteem; P, perfectionism; PA, personal alienation; PT, push to thinness.

considered (body image concerns, avoidance, compulsive self-monitoring, depersonalization, and positive symptom distress index). For more details see Table 2.

3.2.3 | The youth self report

The ANOVA results showed a tendency towards significance for withdrawal/depression ($F_{(3,139)} = 2.446; p = 0.066$) with higher levels in patients who accessed in the year 2022 ($M = 75.38; SD = 14.62$) compared to those who accessed in the year 2020 ($M = 68.49; SD = 13.25$). No statistically significant differences were found for the other dimensions considered (anxiety/depression and somatic complaints). For more details see Table 3.

4 | DISCUSSION

Despite the emerging literature documenting the impact of the COVID-19 pandemic on patients with EDs, few studies have examined this association in a clinical sample of children and adolescents, especially in the Italian context. For these reasons, our study aimed first, to examine the prevalence of CAPU admissions of children and adolescents with EDs from the pre-COVID-19 pandemic to the begin of March 2023, and second, to explore the differences in ED psychopathology, the discomfort related to the image of one's own body, and internalizing symptoms according to the year of access to CAPU.

The results showed that the prevalence of EDs hospitalization was higher during the first and second year of the pandemic compared to the pre-COVID-19 period and the year 2022. Therefore, during the first year and the second year after the outbreak of the pandemic, there was a higher number of admissions of patients with an ED diagnosis. In line with data from several studies (Giacomini et al., 2022; Lin et al., 2021; Otto et al., 2021), our findings confirmed the significant impact of the COVID-19 pandemic on the development or exacerbation of EDs in children and adolescents, particularly from the first and second year of the pandemic (i.e., years 2020 and 2021).

Indeed, we hypothesized that this scenario may occur as a consequence of multiple factors. Certainly, changes in daily routines

and reduction of outdoor activities have made worse weight and shape concerns, eating, exercise, and sleeping habits (e.g., Rodgers et al., 2020; Touyz et al., 2020), contributing to an exacerbation of the EDs symptomatology in the long term. Furthermore, the pandemic and social restrictions reduced individuals' social and healthcare support and adaptive coping strategies. The situation of being home-confined with family members would exacerbate all the symptomatology for individuals with EDs, who had to face conflicts and difficulties in a "no way out" situation. Moreover, being home-confined increased exposure to ED-specific or anxiety-provoking media, such as video conferencing and continuous updates regarding the infection-spreading. This led to a worsening of individuals with EDs symptoms of fear and anxiety, fears of contagion, perception and feelings about health concerns, perhaps leading to a pursuit of restrictive diets focused on increasing immunity (Fernández-Aranda et al., 2020). We anticipated these effects may have been more pronounced during the year of adapting to several changes caused by the pandemic (i.e., the year 2021 in Italy), leading to higher levels of symptomatology and thus more hospital admissions.

Data worthy of attention are those relating to the differences in ED symptomatology according to the year of access to CAPU. Concerning ED psychopathology, patients who accessed in the year 2021 showed higher scores in the push to thinness, body dissatisfaction, asceticism and fear of maturity compared to those who accessed in the pre-pandemic period. Furthermore, our results showed a tendency to increase in personal alienation among the year of access, with higher scores in patients who accessed in the year 2022 compared to those who accessed in the pre-pandemic period. Thus, findings show how in about 2/3 years after the outbreak pandemic there was greater ED risk related to the dimensions of body concerns, dissatisfaction, asceticism and fear of maturity. These data expanded the findings of prior studies conducted in the post-pandemic period, showing long-term effects at about years 2 and 3 of the pandemic compared with the pre-covid period. Studies conducted in the months following the outbreak of the pandemic on adults' or young adults' samples showed an increase in ED symptomatology (e.g., Flaudias et al., 2020; Meda et al., 2021). Specifically, Meda and colleagues (2021) evaluated students' ED symptomatology through the EDI-3 assessment test, reporting an increase in ED symptomatology at EDI-3, in particular at the "ED

TABLE 2 ANOVA summary table of BUT dimensions.

	Year of access	N	M (SD)	F, p
GSI	From 9th March 2019 to 8th March 2020	27	2.31 (1.32)	$F_{(3,93)} = 3.223, p = 0.026$
	From 9th March 2020 to 8th March 2021	29	2.37 (1.56)	
	From 9th March 2021 to 8th March 2022	18	3.12 (0.98)	
	From 9th March 2022 to 8th March 2023	23	3.18 (0.98)	
BIC	From 9th March 2019 to 8th March 2020	30	3.05 (1.42)	$F_{(3,96)} = 1.652, p = 0.183$
	From 9th March 2020 to 8th March 2021	31	2.59 (1.77)	
	From 9th March 2021 to 8th March 2022	17	3.24 (1.30)	
	From 9th March 2022 to 8th March 2023	22	3.46 (1.22)	
WP	From 9th March 2019 to 8th March 2020	30	3.03 (1.55)	$F_{(3,102)} = 3.901, p = 0.011$
	From 9th March 2020 to 8th March 2021	33	2.87 (1.67)	
	From 9th March 2021 to 8th March 2022	20	3.96 (0.84)	
	From 9th March 2022 to 8th March 2023	23	3.82 (1.15)	
A	From 9th March 2019 to 8th March 2020	30	1.44 (1.16)	$F_{(3,103)} = 1.423, p = 0.240$
	From 9th March 2020 to 8th March 2021	33	1.65 (1.35)	
	From 9th March 2021 to 8th March 2022	21	2.03 (1.36)	
	From 9th March 2022 to 8th March 2023	23	2.01 (0.93)	
CSM	From 9th March 2019 to 8th March 2020	30	2.54 (1.46)	$F_{(3,99)} = 2.043, p = 0.113$
	From 9th March 2020 to 8th March 2021	32	2.66 (1.76)	
	From 9th March 2021 to 8th March 2022	18	3.22 (1.03)	
	From 9th March 2022 to 8th March 2023	23	3.37 (1.07)	
D	From 9th March 2019 to 8th March 2020	30	1.90 (1.44)	$F_{(3,96)} = 1.725, p = 0.167$
	From 9th March 2020 to 8th March 2021	29	2.16 (1.69)	
	From 9th March 2021 to 8th March 2022	18	2.43 (1.20)	
	From 9th March 2022 to 8th March 2023	23	2.77 (1.27)	
PST	From 9th March 2019 to 8th March 2020	26	24.46 (10.99)	$F_{(3,99)} = 2.618, p = 0.055$
	From 9th March 2020 to 8th March 2021	33	17.83 (12.68)	
	From 9th March 2021 to 8th March 2022	21	21.36 (11.42)	
	From 9th March 2022 to 8th March 2023	23	25.39 (9.25)	
PSDI	From 9th March 2019 to 8th March 2020	26	2.87 (1.11)	$F_{(3,99)} = 0.536, p = 0.658$
	From 9th March 2020 to 8th March 2021	33	3.52 (3.71)	
	From 9th March 2021 to 8th March 2022	21	3.17 (0.88)	
	From 9th March 2022 to 8th March 2023	23	2.90 (0.56)	

Note: In bold are reported the significant difference between the year of access.

Abbreviations: A, avoidance; ANOVA, analysis of variance; BIC, body image concerns; BUT, body uneasiness test; CSM, compulsive self-monitoring; D, depersonalization; GSI, global severity index; PSDI, positive symptom distress index; PST, positive symptom total; WP, weight phobia.

Risk" subscale, among undergraduate students with a history of ED (AN, BN, and/or BN), while Flaudias and colleagues (2020) found higher levels of body dissatisfaction and low impulse regulation on the EDI-2 during the first period of COVID-19 outbreak confinement.

Considering the discomfort related to the image of one's own body (BUT), findings show that patients who accessed in the year

2022 reported higher scores in the global severity index compared to those who accessed in the pre-pandemic period. Besides, patients who accessed in the year 2021 reported higher levels of weight phobia compared to those who accessed in the year 2020. Additionally, a tendency to increase in positive symptom total among the year of access was found, with higher scores in patients who

TABLE 3 Descriptive results for internalizing symptoms of YSR.

	Year of access	N	M (SD)	F, p
A/D	From 9th March 2019 to 8th March 2020	31	71.16 (13.32)	$F_{(3,139)} = 0.167, p = 0.919$
	From 9th March 2020 to 8th March 2021	39	69.10 (14.65)	
	From 9th March 2021 to 8th March 2022	44	70.89 (11.84)	
	From 9th March 2022 to 8th March 2023	29	69.72 (17.99)	
W/D	From 9th March 2019 to 8th March 2020	31	69.03 (11.95)	$F_{(3,139)} = 2.446, p = 0.066$
	From 9th March 2020 to 8th March 2021	39	68.49 (13.25)	
	From 9th March 2021 to 8th March 2022	44	74.39 (13.15)	
	From 9th March 2022 to 8th March 2023	29	75.38 (15.62)	
SC	From 9th March 2019 to 8th March 2020	31	61.77 (10.78)	$F_{(3,139)} = 0.545, p = 0.652$
	From 9th March 2020 to 8th March 2021	39	61.03 (10.64)	
	From 9th March 2021 to 8th March 2022	44	61.55 (9.27)	
	From 9th March 2022 to 8th March 2023	29	64.00 (9.29)	

Abbreviations: A/D, anxious/depression; SC, somatic complaints; W/D, withdrawal/depression; YSR, Youth Self Report ASEBA.

accessed in the year 2022 compared to those who accessed in the year 2020. However, no significant differences were found according to the different years of access for the other dimensions considered (Body Image Concerns, Avoidance, Compulsive Self-Monitoring, Depersonalization, and Positive Symptom Distress Index). These first results shed light on the trend of specific symptoms related to ED in the short and long term into the pandemic in children and adolescents. In fact, from our knowledge, there are no studies that evaluated the trends of ED psychopathology and the perception of one's own body with specific instruments during this developmental phase. An important fact that could have played a role in the worsening of EDs was the difficulties presented by limited and impaired access to healthcare interventions, which could have led to further exacerbation of mental health issues of individuals with ED in the long term. In fact, during the pandemic, fewer patients received comprehensive interdisciplinary treatment, including all treatment providers (psychiatrists, clinical nutritionists, and psychotherapists). Instead, during that period, many patients received only telemedicine (Reed & Ort, 2022; Yaffa et al., 2021). The lack of multidisciplinary treatment, and the face-to-face relationship could lead to a decrease of the patient's treatment compliance. In addition, the almost total relaxation of restrictive measures at the end of the year 2021 exposed children and adolescents to a resumption of normal routines exposing them to new risks such as social confrontation. Thus, these results demonstrate the importance of good public health support also in the long term, especially in this historical period and above all in a population group at risk, such as adolescents with EDs.

Finally, concerning the trend of internalizing symptoms assessed with YSR, our results showed a tendency to increase in withdrawal and depression symptoms among the year of access, with higher scores in patients who accessed in the year 2022 compared to those who accessed in the year 2020. These data are partially supported by the reference literature (Devoe et al., 2022), even if most studies

have analyzed this association with the adult population (McCombie et al., 2020; Monteleone et al., 2021) and few studies have been conducted on children and adolescents (e.g., Spettigue et al., 2021). We can hypothesize that the pandemic could have contributed to withdrawal and depressive symptoms because of its peculiar characteristics (restrictive measures, alterations of habits and routines, alteration of the support and healthcare network) that could have exacerbated symptoms related, for example, to loneliness, and depressive mood, especially in the come back to the normal routines. Conversely, anxious-depressive symptoms did not increase during the years of the pandemic, according to one of the few studies conducted on youth samples (i.e., Spettigue et al., 2021). That study did not find an increase in anxiety and depressive symptoms comparing patients assessed in 2019 versus 2020, through the RCADS. The stability of anxiety symptoms during the pandemic could be explained by the reductions of several situations related to dealing with social situations and with other people, bringing benefits to anxiety levels and leading to stability of anxiety levels over time.

Overall, this study analyzed the impact of COVID-19 during different phases of the pandemic for a total of 3 years from the actual outbreak. The results highlighted that children and adolescents with EDs showed a worsening of some symptoms more related to weight concerns in the year 2022, and particularly in the year 2021, compared to the pre-pandemic period.

These data confirmed the significant impact of the COVID-19 pandemic on the development or worsening of ED in children and adolescents; however, what is particularly interesting is that the results highlighted that the worsening of the majority of ED-related symptoms did not occur in the acute period of the spread of the virus during the first year (2020), but later, from 2021 onwards. These data showed a delayed/long-term effect of the pandemic, rather than an immediate effect, on ED symptomatology. The initial period of restriction constituted in fact a social and psychological risk factor for

the worsening of ED symptoms, that emerged later, in the following years (2021–2022). In addition, the subsequent relaxation of the restrictive measures, which occurred in 2021, exposed children and adolescents with EDs, already affected by the consequences of the lockdown period, to a resumption of normal routines and to new risks such as social confrontation; this fact could also have played an important role in the worsening of ED symptomatology and could explain the late appearance of the worsening of EDs symptoms.

4.1 | Strengths, limitations, and future studies

This study has some strengths, including having analyzed the impact of the pandemic on a sample of Italian children and adolescents with ED, on which the literature is still scarce. Moreover, it considered different types of symptomatology both specific to ED (ED psychopathology and image of one's own body) and more general (internalizing symptoms). Finally, we considered the effect of different periods from pre- to post-pandemic on ED's symptomatology.

Despite these strengths, the study's findings should be interpreted considering several limitations. First, the small sample of patients with EDs. Second, the use of only self-report measures. To address this limitation, an integrated methodology that also captures the qualitative dimension in addition to the quantitative dimension, such as interviews and focus groups, could be useful. Additionally, the age of patients has not been included in the analysis as a factor affecting the EDs' symptomatology. Given the importance of the developmental period in EDs, future studies should analyze the impact of the pandemic on EDs symptomatology taking into consideration different age groups. Besides, the different ED diagnoses (i.e., AN, BN, and BE) and/or comorbidities have not been included in the analysis as a factor affecting the EDs' symptomatology. Also, the EDs trends and the impact of the pandemic on symptomatology was not analyzed using a longitudinal design, but the sample of patients admitted each year was considered. Future studies could continue to investigate the long-term trend of symptoms and the effects of the pandemic on the mental health of children and adolescents at risk. Specifically, it would be interesting to investigate how much the resumption of normal routines and activities may have influenced ED symptoms, analyzing the trend in the long term.

AUTHOR CONTRIBUTIONS

Pietro Cappelletto: manuscript conception and preparation; writing of the draft; manuscript submission. **Lisa De Luca:** manuscript conception and preparation; writing of the draft. **Benedetta Taddei:** manuscript conception, data collection and preparation; writing of the draft. **Silvia Taddei:** manuscript conception, performed material preparation and data collection. **Annalaura Nocentini:** manuscript conception and preparation; writing and review of the draft. **Tiziana Pisano:** manuscript conception and preparation; writing and review of the draft. All

authors contributed to the study conception and design. All authors read and approved the final manuscript.

CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT

the dataset generated during the current study are available from the corresponding author on reasonable request.

ETHICS STATEMENT

This study was performed in line with the principles of the Declaration of Helsinki. The study was approved by the Paediatric Ethics Committee of the Tuscany Region, number (101/2022). Written informed consent was obtained from the parents.

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