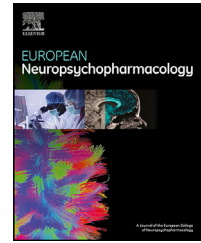




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The impact of the COVID-19 pandemic on eating disorders: A paradigm for an emotional post-traumatic stress model of eating disorders

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The COVID-19 pandemic has seriously affected mental health in the general population. People suffering from pre-existing psychiatric conditions have been even more vulnerable during this event and long-term sequelae can be hypothesized in the light of previous trauma studies. Eating Disorders (EDs) are severe mental illnesses with serious physical and psychiatric comorbidity. The impact of the COVID-19 pandemic on people with EDs has been studied since the introduction of quarantine measures and it is possible to hypothesize that findings from those studies may provide empirical information on the pathogenesis and treatment of EDs.

First of all, heightened levels of abnormal ED-related behaviors, including food restriction, physical exercise and binge-purging episodes, have been found in people with EDs during the first lockdown period (March–May 2020) as well as high distress in their caregivers. More surprisingly, an impairment in general psychopathology (i.e., anxiety, depression and post-traumatic and obsessive-compulsive symptoms) was also detected in this population, with evidence that the worsening of internalizing symptoms persisted longer than that of specific symptoms (Monteleone et al., 2021). No significant differences between the main ED diagnoses have been found in relation

to the COVID-19 pandemic effects. However, evidence has also been provided that some patients did not show a significant deterioration of symptomatology possibly due to decreased daily stressors promoted by lockdown-related lack of work and social pressure (Vuillier et al., 2021). In line with this, a second study wave identified putative risk and protection factors regarding the impact of the COVID-19 pandemic on EDs (Baenas et al., 2020; Castellini et al., 2020; Monteleone et al., 2021; Vuillier et al., 2021). Risk factors include consequences of the pandemic-induced lockdown (such as less time spent with friends and more with household members, changes in routine activities and increased exposure to both diet and thin-related social media messages) and personality-related characteristics (namely, early adverse experiences and low self-directedness). Familiar conflicts affected especially adolescents (Graell et al., 2020) given their need to hide ED-related behaviors from parents and increased scrutiny and pressure from others which resulted in an increased interpersonal stress (Branley-Bell & Talbot, 2020). Consistent with the resilience perspective in the pandemic context (Vinkers et al., 2020), therapeutic relationships providing a sense of security were an important resilience factor, as were adaptive emotional coping strategies (i.e., setting appropriate boundaries for self-care or dealing with activities providing distraction) and planning routine activities.

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Overall, literature findings (Baenas et al., 2020; Monteleone et al., 2021) Vuillier et al., 2021) converge on the identification of a relationship between negative emotions (feelings of sadness, anhedonia, worthlessness, anxiety and uncertainty) and exacerbation of ED specific and general symptoms during the pandemic, with a possible interplay between ED-related and internalizing symptoms. Emotion regulation difficulties may be considered the common mechanism conveying a pre-existing vulnerability towards symptom onset/deterioration in the presence of a traumatic event. Furthermore, the COVID-19 related data suggest that the emotional vulnerability of ED patients to stressful events is characterized by high sensitivity to disruption in interpersonal relationships, as indicated by the effects exerted by changes in friendships as well as familiar and therapeutic bonds during the pandemic period. Thus, it is possible to highlight an emotional, post-traumatic and interpersonal nature of psychopathology exacerbation in people with EDs. This pathogenetic model of EDs is consistent with theories positing a central role of emotion dysregulation in the etiology and maintenance of EDs (Oldershaw et al., 2019) with social difficulties constituting risk and/or maintenance factors (Treasure et al., 2020). However, the specificity of the evidence derived from studies exploring the impact of COVID-19 on people with EDs is related to the nature of these findings. Indeed, the COVID-19 pandemic has constituted a huge laboratory providing opportunities for researchers to explore *in vivo* the effects of an acute traumatic event: this has yielded more reliable results than those from self-report cross-sectional findings related to stressful life events. The distressing experience exacerbated by the COVID-19 pandemic encompasses different types of stress, spanning social, family, economic and health related concerns, making it possible to assess them simultaneously and to disentangle their effects on mental health. On the other hand, previous studies exploring stress exposure in the ED field have rarely adopted an experimental approach, have not provided a comprehensive evaluation of different types of stress exposure effects and have been conducted in small populations: these methodological limitations significantly affect the reliability of their findings (Glashouwer et al., 2020). Of course, the suggested model refers to the exacerbation more than to the onset of symptomatology in people affected by EDs and does not rule out the role of ED vulnerability factors (e.g., childhood and adolescence events or personality traits) whose contribution has not been adequately explored during the pandemic.

In comparison to this pathogenetic evidence, only a few empirical recommendations can be inferred regarding the impact of the COVID-19 pandemic on treatment in EDs. A reduction in direct access to care with a transition to telehealth medicine has often been observed. A small amount of data on the efficacy of online treatments has been gathered, although patients' concerns related to this strategy have been suggested. In particular, a qualitative study (Vuillier et al., 2021) revealed potential barriers to online treatment, such as practical difficulties (e.g., the quality of internet connectivity and the availability of a private space at home) and feelings of detachment, although it highlighted that this kind of care allows patients to maintain a therapeutic relationship providing them with support to deal with the pandemic-induced distress. People with EDs

often indicated the online treatment as the best alternative when traditional face-to-face support was unavailable.

In the light of the literature, we can suggest that the COVID-19 pandemic was and is a traumatic event significantly affecting the mental health of people with EDs, in terms of the worsening of internalizing and specific ED symptoms, possibly through the exacerbation of emotion regulation difficulties. This evidence may provide a model to guide clinicians in the management of ED patients, suggesting the therapeutic need to target the antecedents that trigger negative emotions. Researchers are also advised to consider this model in future studies and to explore the validity of treatments during the pandemic.

Declaration of Competing Interest

The author reports no biomedical financial interests or potential conflicts of interest with this paper.

References

- Baenas, I., Caravaca-Sanz, E., Granero, R., Sánchez, I., Riesco, N., Testa, G., Vintró-Alcaraz, C., Treasure, J., Jiménez-Murcia, S., Fernández-Aranda, F., 2020. COVID-19 and eating disorders during confinement: analysis of factors associated with resilience and aggravation of symptoms. *Eur. Eat. Disord. Rev.* 28, 855–863. doi:[10.1002/erv.2771](https://doi.org/10.1002/erv.2771).
- Branley-Bell, D., Talbot, C.V., 2020. Exploring the impact of the COVID-19 pandemic and UK lockdown on individuals with experience of eating disorders. *J. Eat. Disord.* 8. doi:[10.1186/s40337-020-00319-y](https://doi.org/10.1186/s40337-020-00319-y).
- Castellini, G., Cassioli, E., Rossi, E., Innocenti, M., Gironi, V., Sanfilippo, G., Felciai, F., Monteleone, A.M., Ricca, V., 2020. The impact of COVID-19 epidemic on eating disorders: a longitudinal observation of pre versus post psychopathological features in a sample of patients with eating disorders and a group of healthy controls. *Int. J. Eat. Disord.* 53, 1855–1862. doi:[10.1002/eat.23368](https://doi.org/10.1002/eat.23368).
- Glashouwer, K.A., Brockmeyer, T., Cardi, V., Jansen, A., Murray, S.B., Blechert, J., Levinson, C.A., Schmidt, U., Tchanturia, K., Wade, T.D., Svaldi, J., Giel, K.E., Favaro, A., Fernández-Aranda, F., Friederich, H., Naumann, E., Treasure, J.L., Tuschen-Caffier, B., Vocks, S., Werthmann, J., 2020. Time to make a change: a call for more experimental research on key mechanisms in anorexia nervosa. *Eur. Eat. Disord. Rev.* 28, 361–367. doi:[10.1002/erv.2754](https://doi.org/10.1002/erv.2754).
- Graell, M., Morón-Nozaleda, M.G., Camarero, R., Villaseñor, Á., Yáñez, S., Muñoz, R., Martínez-Núñez, B., Miguélez-Fernández, C., Muñoz, M., Faya, M., 2020. Children and adolescents with eating disorders during COVID-19 confinement: difficulties and future challenges. *Eur. Eat. Disord. Rev.* 28, 864–870. doi:[10.1002/erv.2763](https://doi.org/10.1002/erv.2763).
- Monteleone, A.M., Cascino, G., Marciello, F., Abbate-Daga, G., Baiano, M., Balestrieri, M., Barone, E., Bertelli, S., Carpinello, B., Castellini, G., Corrivetti, G., De Giorgi, S., Favaro, A., Gramaglia, C., Marzola, E., Meneguzzo, P., Monaco, F., Oriani, M.G., Pinna, F., Rania, M., Redaelli, C.A., Renna, C., Ricca, V., Salvo, P., Baldissera, E., Segura-García, C., Todisco, P., Volpe, U., Zeppegno, P., Monteleone, P., 2021. Risk and resilience factors for specific and general psychopathology worsening in people with Eating Disorders during COVID-19 pandemic: a retrospective Italian multicentre study. *Eat. Weight Disord.* 1, 3. doi:[10.1007/s40519-020-01097-x](https://doi.org/10.1007/s40519-020-01097-x).
- Monteleone, A.M., Marciello, F., Cascino, G., Abbate-Daga, G., Anselmetti, S., Baiano, M., Balestrieri, M., Barone, E.,

- Bertelli, S., Carpiniello, B., Castellini, G., Corrivetti, G., De Giorgi, S., Favaro, A., Gramaglia, C., Marzola, E., Meneguzzo, P., Monaco, F., Oriani, M.G., Pinna, F., Rania, M., Renna, C., Ricca, V., Salvo, P., Segura-Garcia, C., Scarabel, F., Todisco, P., Volpe, U., Zeppegno, P., Monteleone, P., 2021. The impact of COVID-19 lockdown and of the following “re-opening” period on specific and general psychopathology in people with Eating Disorders: the emergent role of internalizing symptoms. *J. Affect. Disord.* 285, 77-83. doi:[10.1016/j.jad.2021.02.037](https://doi.org/10.1016/j.jad.2021.02.037).
- Oldershaw, A., Startup, H., Lavender, T., 2019. Anorexia Nervosa and a lost emotional self: a psychological formulation of the development, maintenance, and treatment of Anorexia Nervosa. *Front. Psychol.* 10, 1-22. doi:[10.3389/fpsyg.2019.00219](https://doi.org/10.3389/fpsyg.2019.00219).
- Treasure, J., Willmott, D., Ambwani, S., Cardi, V., Clark Bryan, D., Rowlands, K., Schmidt, U., 2020. Cognitive interpersonal model for Anorexia Nervosa revisited: the perpetuating factors that contribute to the development of the severe and enduring illness. *J. Clin. Med.* 9, 630. doi:[10.3390/jcm9030630](https://doi.org/10.3390/jcm9030630).
- Vinkers, C.H., van Amelsvoort, T., Bisson, J.I., Branchi, I., Cryan, J.F., Domschke, K., Howes, O.D., Manchia, M., Pinto, L., de Quervain, D., Schmidt, M.V., van der Wee, N.J.A., 2020. Stress resilience during the coronavirus pandemic. *Eur. Neuropsychopharmacol.* 35, 12-16. doi:[10.1016/j.euroneuro.2020.05.003](https://doi.org/10.1016/j.euroneuro.2020.05.003).
- Vuillier, L., May, L., Greville-Harris, M., Surman, R., Moseley, R.L., 2021. The impact of the COVID-19 pandemic on individuals with eating disorders: the role of emotion regulation and exploration of online treatment experiences. *J. Eat. Disord.* 9, 1-18. doi:[10.1186/s40337-020-00362-9](https://doi.org/10.1186/s40337-020-00362-9).