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## A paradoxical psychological impact of COVID-19 among a sample of Italian adults with High Functioning Autism Spectrum Disorder



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### ABSTRACT

**Background:** Since February 2020, many governments of the world ordered strict social distancing rules to try to contain the COVID-19 pandemic, with a reported consequent increase in levels of stress, anxiety and depression in the general population. Aim of this study was to assess the prevalence of the aforementioned psychiatric symptoms across a sample of individuals with High Functioning Autism Spectrum Disorders (HF-ASDs) with respect to a group of neurotypical adults (NA), during the first two months of COVID-19 pandemic in Italy.

**Method:** 45 adults with HF-ASDs and 45NA completed a structured online questionnaire, including; the Depression, Anxiety and Stress Scale – 21 items (DASS-21); the Impact of Event Scale-Revised (IES-R); the Perceived Stress Scale (PSS). We also explored some specific aspects of participants' psychological well-being through an ad-hoc questionnaire.

**Results:** Subjects with HF-ASDs scored significantly higher than NA at the DASS-21, the IES-R Total Score and the PSS; NA reported a higher perceived change of their lifestyle during the lockdown than individuals with HF-ASDs, and subjects with HF-ASDs reported to feel more comfortable and less tired during the lockdown period, in relation to the social distancing measures adopted by Italian authorities.

**Conclusions:** Adults with HF-ASDs presented higher rates of depression, anxiety, stress and PTSD-related symptoms than NA during the first two months of COVID-19 pandemic. However, they also reported to feel subjectively more comfortable and less tired during the lockdown than before, in relation to the social distancing measures.

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### 1. Introduction

Throughout 2020, governments worldwide have ordered strict measures to try to contain the outbreak of COVID-19, with a reported consequent increase in levels of stress, anxiety and depression especially in healthcare workers and individuals with preexistent psychiatric conditions [1–3]. However, in our clinical practice, we observed that patients with difficulties in social interaction (e.g., patients with social phobia) often reported an improvement of their psychological well-being: we hypothesized

that specific groups of individuals might be able to handle social distancing better than the general population [4]. Autism Spectrum Disorders are characterized by “persistent deficits in social communication and interaction across multiple contexts” [5] and can be thought as a continuum, from a pole with severe delay in cognitive, social and emotional development, to a pole with selective impairment in understanding and responding to social cues but no intellectual disabilities (“High-Functioning Autism”, HF-ASDs) [6]. Aim of this study was to assess the prevalence of stress, anxiety, depression and symptoms related to post-

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traumatic stress disorder (PTSD), during the first two months of COVID-19 pandemic in Italy, in a sample of patients with HF-ASDs, compared to a group of neurotypical adults (NA).

## 2. Methods

45 adults with HF-ASDs, previously diagnosed following DSM-5 criteria [5] and the Autism Diagnostic Observation Schedule–2, Module 4 [7], were recruited from the outpatient clinic of San Paolo hospital in Milan (Italy). 45 gender- and age-matched NA were recruited amongst hospital staff acquaintances; their “healthy state” was determined through an anamnestic and clinical interview. Participants completed: the Depression, Anxiety and Stress Scale (DASS-21), measuring depression, anxiety and stress experienced over the past week [8]; the Impact of Event Scale-Revised (IES-R) [9], assessing the subjective distress experienced over the last week caused by traumatic events; the Perceived Stress Scale (PSS), evaluating the levels of stress perceived in the last month [10]; an ad-hoc questionnaire designed for the study (Supplementary Material), assessing: their levels of tiredness before and during the lockdown; the degree to which they thought their lifestyle had changed during the lockdown; whether they thought the social distancing measures had worsened or improved their psychological well-being. The study was approved by San Paolo hospital Ethics Committee. All participants signed an informed consent form. Statistical analysis was performed using SPSS.26 ( $p < 0.05$  deemed significant). Data collection took place between 4th and 8th May 2020, immediately after the first lockdown (which, in Italy, ended on the 3rd of May 2020). No participant was infected by COVID-19.

## 3. Results

HF-ASDs participants scored significantly higher than NA at the DASS-21 (Total Score and subscales), IES-R (Total Scores and subscales), and PSS. NA reported a higher perceived change of lifestyle during the lockdown than HF-ASDs participants. Compared to NA, HF-ASDs individuals reported to feel more comfortable during the lockdown period in relation to the social distancing measures

adopted by Italian authorities, and declared to arrive at the end of their study/work day significantly less tired during the lockdown than during the month before (Fig. 1, Table 1).

## 4. Discussion

The higher prevalence of stress, anxiety, depression and PTSD-related symptoms we found in HF-ASDs subjects might have multiple explanations: first, they might be predisposed by a biological vulnerability; second, anxiety and depression might be part of the ASDs clinical phenotype itself and might not be the expression of a separate comorbid psychiatric disorder; third, environmental factors and stressful events, such as the lack of social support, might have a crucial role in the development of psychiatric symptoms [11]. Thus, it is not surprising that we found higher rates of psychiatric symptoms in a sample of HF-ASDs individuals than in a sample of NA during the first two months of the COVID-19 pandemic, an extraordinary stressful event. Concerning this point, Mazzone et al [10] recently showed that a broader range of life events, such as bullying and traumas relating to mental health problems appear to be experienced as traumatic and may act as a catalyst for PTSD development in adults with ASDs. On the other hand, it must be noted that the rates of the explored psychiatric symptoms in our sample of individuals with HF-ASDs are not higher than the rates found in previous studies exploring the same symptoms in individuals with HF-ASDs independently from the pandemic condition [11–14], unlike the general population [1,15]. The results obtained through our ad-hoc questionnaire might help explaining this discrepancy: individuals with HF-ASDs, compared to NA, reported to feel subjectively more comfortable during the lockdown period than before, in relation to the social distancing measures ordered by Italian authorities, which implied a clear decrease in social interactions. Moreover, subjects with HF-ASDs, but not NA, reported to arrive at the end of their study/work day significantly less tired during the lockdown than during the month before the lockdown. These data are intriguing, since they seem to show that subjects with HF-ASDs somehow benefit from the lockdown, in terms of feeling more comfortable with the social distancing measures and feeling less tired at the end of the day. This result, along with the fact that we did not find an increased prevalence of psychiatric symptoms in subjects with HF-ASDs during the lockdown period when compared to results of studies conducted in pre-pandemic times, might be explained by some intrinsic clinical features of the HF-ASDs itself, such as the difficulty in social interaction and the feeling of perceiving themselves as different from the majority of other people. In this view, the lockdown might represent a situation where individuals with HF-ASDs manage to represent themselves as more similar to others, experiencing the same situation and facing the same difficulties. Main limitations of our study are the fact that we did not have a pre-lockdown assessment and that all data were self-reported. However, our results give first evidence that individuals with HF-ASDs might paradoxically benefit, in terms of well-being, from the lockdown imposition. Future studies, with a longer follow-up, should assess whether our results become chronic with the prolonging of the social distancing measures or only reflected the acute response to lockdown.

### Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

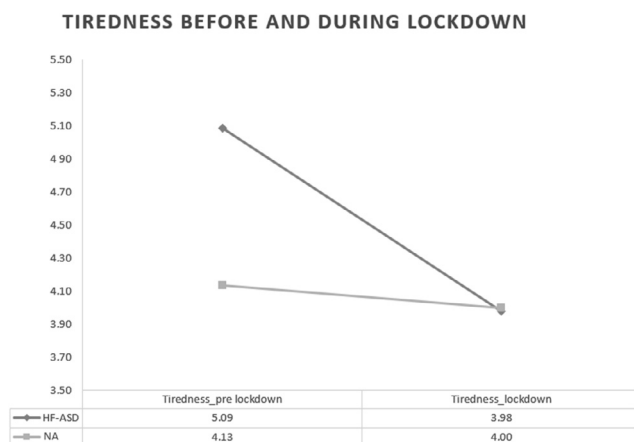


Fig. 1. Self-rated levels of tiredness before and during lockdown, reported by subjects with Autism Spectrum Disorders without intellectual disabilities and NA. Abbreviations: ASD = Autism Spectrum Disorder without intellectual disabilities; HC = Neurotypical Adults.

**Table 1**

Sociodemographic and psychometric data for ASD without intellectual disabilities and NA. Abbreviations: ADOS-2 = Autism Diagnostic Observation Schedule – 2nd version, DASS-21 = Depression, Anxiety and Stress Scale – 21 items; ASD = Autism Spectrum Disorder; NA = Neurotypical adults; IES-R = Impact of Event Scale-Revised; N = Numerosity; PSS = Perceived Stress Scale; SD = Standard Deviation; N/A = Not Applicable; Statistical index: t = t-test for independent sample; x = x squared; F = Repeated Measure ANOVA.

|   |                               | ASD         | NA          | Statistical index  | p  |
|---|-------------------------------|-------------|-------------|--|--|
| Age, mean (SD)  |                               | 37.5 (13.2) | 40.2 (14.7) | t = 0.919  | 0.361                                      |
| Gender, N (%)   | M                             | 29 (64.4)   | 23 (51.1)   | x = 1.692  | 0.429                                      |
|   | F                             | 15 (33.3)   | 21 (46.7)   |  |  |
|   | Non binary                    | 1 (2.2)     | 1 (2.2)     |  |  |
| ADOS-2 Communication, mean (SD)                                   |                               | 4.4 (2.1)   | N/A         | N/A  | N/A  |
| ADOS-2 Reciprocal social interaction, mean (SD)                   |                               | 7.9 (3.4)   | N/A         | N/A  | N/A  |
| ADOS-2 Imagination/Creativity, mean (SD)                          |                               | 1.5 (0.7)   | N/A         | N/A  | N/A  |
| ADOS-2 Stereotyped behaviours and restricted interests, mean (SD) |                               | 1.3 (1.1)   | N/A         | N/A  | N/A  |
| ADOS-2 Social communication Total, mean (SD)                      |                               | 12.2 (4.9)  | N/A         | N/A  | N/A  |
| Activity before lockdown, N (%)                                   | High school student           | 2 (4.4)     | 1 (2.2)     | N/A  | N/A  |
|   | University student            | 9 (20)      | 2 (4.4)     |  |  |
|   | Working mostly away from home | 22 (48.9)   | 27 (60)     |  |  |
|   | Working mostly from home      | 7 (15.6)    | 8 (17.8)    |  |  |
|   | Unoccupied                    | 4 (8.9)     | 3 (6.7)     |  |  |
|   | Retired                       | 1 (2.2)     | 4 (8.9)     |  |  |
| Activity during lockdown, N (%)                                   | Working mostly away from home | 5 (11.1)    | 3 (6.7)     | N/A  | N/A  |
|   | Working mostly from home      | 29 (64.4)   | 34 (75.6)   |  |  |
|   | Unoccupied                    | 11 (24.4)   | 8 (17.8)    |  |  |
| Tiredness before lockdown, mean (SD)                              |                               | 5.1 (1.6)   | 4.1 (1.6)   | F (1, 88) = 5.64<br>(interaction effect Tiredness*Group) | 0.020 (interaction effect Tiredness*Group) |
| Tiredness during lockdown, mean (SD)                              |                               | 4 (2)       | 4 (1.8)     |  |  |
| Lifestyle during lockdown, mean (SD)                              |                               | 4.6 (1.7)   | 5.4 (1.4)   | t = 2.606  | 0.011                                      |
| Psychological wellbeing during lockdown, mean (SD)                |                               | 4.7 (1.9)   | 2.8 (1.3)   | t = - 5.544  | < 0.001                                    |
| DASS-21 Total Score, mean (SD)                                    |                               | 19.3 (13.9) | 9.2 (5.9)   | t = - 4.452  | < 0.001                                    |
| DASS-21 Stress, mean (SD)   |                               | 7.6 (5.5)   | 5.4 (2.9)   | t = -2.335   | 0.023                                      |
| DASS-21 Stress, N (%)   | Normal                        | 26 (57.8)   | 34 (75.6)   | N/A  | N/A  |
|   | Mild                          | 4 (8.9)     | 8 (17.8)    |  |  |
|   | Moderate                      | 8 (17.8)    | 3 (6.7)     |  |  |
|   | Severe                        | 3 (6.7)     | 0           |  |  |
|   | Extremely severe              | 4 (8.9)     | 0           |  |  |
| DASS-21 Anxiety, mean (SD)  |                               | 3.5 (4.2)   | 1.2 (1.7)   | t = - 3.342  | 0.001                                      |
| DASS-21 Anxiety, N (%)  | Normal                        | 30 (66.7)   | 39 (86.7)   | N/A  | N/A  |
|   | Mild                          | 5 (11.1)    | 5 (11.1)    |  |  |
|   | Moderate                      | 3 (6.7)     | 1 (2.2)     |  |  |
|   | Severe                        | 3 (6.7)     | 0           |  |  |
|   | Extremely severe              | 4 (8.9)     | 0           |  |  |
| DASS-21 Depression, mean (SD)                                     |                               | 8.2 (6.1)   | 2.6 (2.2)   | t = - 5.763  | < 0.001                                    |
| DASS-21 Depression, N (%)   | Normal                        | 15 (33.3)   | 38 (84.4)   | N/A  | N/A  |
|   | Mild                          | 6 (13.3)    | 2 (4.4)     |  |  |
|   | Moderate                      | 10 (22.2)   | 5 (11.1)    |  |  |
|   | Severe                        | 2 (6.7)     | 0           |  |  |
|   | Extremely severe              | 11 (24.4)   | 0           |  |  |
| IES-R Total Score, mean (SD)                                      |                               | 25.7 (16.4) | 9.1 (7.6)   | t = - 6.15   | 0.004                                      |
| IES-R Total Score, N (%)  | Normal                        | 23 (51.1)   | 42 (93.3)   | N/A  | N/A  |
|   | Mild psychological impact     | 4 (8.9)     | 2 (4.4)     |  |  |
|   | Moderate psychological impact | 4 (8.9)     | 1 (2.2)     |  |  |
|   | Severe psychological impact   | 14 (31.1)   | 0           |  |  |
| IES-R Avoidance, mean (SD)  |                               | 1.1 (0.7)   | 0.4 (0.4)   | t = - 5.888  | < 0.001                                    |
| IES-R Intrusion, mean (SD)  |                               | 1.1 (0.9)   | 0.4 (0.3)   | t = - 5.063  | < 0.001                                    |
| IES-R Hyperarousal, mean (SD)                                     |                               | 1.3 (0.9)   | 0.5 (0.4)   | t = - 5.441  | < 0.001                                    |
| PSS, mean (SD)  |                               | 22.3 (8.1)  | 14.6 (4.7)  | t = - 5.44   | < 0.001                                    |
| PSS, N (%)  | Low stress                    | 6 (13.3)    | 18 (40)     | N/A  | N/A  |
|   | Moderate stress               | 27 (60)     | 27 (60)     |  |  |
|   | High stress                   | 12 (26.7)   | 0           |  |  |

**Appendix A. Supplementary data**

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jocn.2021.11.026>.

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