Resilience of people with a history of mental disorder during the COVID-19 pandemic: an international 2-years longitudinal prospective study

Irene Pinucci
Sapienza University of Rome

Federico Tedeschi
University of Verona

Riccardo Serra
University of Verona

Martina Patanè
Vrije Universiteit Amsterdam

Ceren Acartük
Koç University

Dhini Andriani
Padjadjaran University

Richard A. Bryant
UNSW Sydney

Sebastian Burchert
Freie Universität Berlin

Giulia Caggiu
ASST Lecco, Lombardy Region

Daniel Campos
University of Zaragoza

Claudia Conflitti
University of Milano-Bicocca

Camille Davisse-Paturet
Inserm

Mireia Félez-Nóbrega
Institut Sant Joan de Déu

Daniela Fuhr
Leibniz Institute of Prevention Research and Epidemiology

Brian Hall
New York University Shanghai

Josep Maria Haro
Institut Sant Joan de Déu

Anja Huizinik
  Vrije Universiteit Amsterdam

Christine Knaevelsrud
  Freie Universität Berlin

Gülsah Kurt
  Koç University

Agnes Lam
  University of Macau

Ingmar Leijen
  Vrije Universiteit Amsterdam

Roberto Mediavilla
  Universidad Autonóma de Madrid

Maria Melchior
  Inserm

Ellenor Mittendorfer-Rutz
  Karolinska Institutet

Matteo Monzio Compagnoni
  University of Milano-Bicocca

Morina Naser
  University Hospital of Zurich

Pablo Nicaise
  Université Catholique de Louvain

Christina Palantza
  Vrije Universiteit Amsterdam

Catherine Panter-Brick
  Yale University

Davide Papola
  Harvard Medical School

Soledad Quero
  Jaume I University

Cristina Rodriguez Prada
  Hospital Universitario de la Princesa

Soraya Seedat
  Stellenbosch University

Hari Setyowibowo
  Padjadjaran University

Pierre Smith
  Sciensano (Belgium)
Research Article

**Keywords:** COVID-19 pandemic, Mental disorders, Resilience, Stress, Prospective cohort study.

**Posted Date:** December 28th, 2023

**DOI:** https://doi.org/10.21203/rs.3.rs-3781423/v1

**License:** This work is licensed under a Creative Commons Attribution 4.0 International License. Read Full License

**Additional Declarations:** No competing interests reported.
Abstract

Background

During the COVID-19 pandemic, the global population was exposed to a significant psychological distress, however, subgroups of vulnerable individuals proved resilient throughout the pandemic. This study aims to identify predictors of long-term, sustained resilience among people with a history of mental disorder during the first two years of the pandemic.

Methods

In this international 2-year, 5-wave longitudinal online survey, the Patient Health Questionnaire-9, the Generalized Anxiety Disorder Scale, and the PTSD Checklist DSM-5 were used for a proxy measure of psychological distress. As possible predictors of sustained resilience, we investigated socio-demographic characteristics, economic and housing status, pandemic-related issues, chronic diseases, social support, fear of contamination and personal values which were investigated respectively through the Oslo Social Support Scale, the Padua Inventory, and the Portrait Values Questionnaire. Data were analysed with a Mover-Stayer Latent Transition Analysis model.

Results

Nine-hundred and forty-three participants with a mental disorder were included in the analysis. Variables associated with a higher chance of sustained resilience were older age, maintaining a job, and having more people in the household. In contrast, female gender, losing job, difficulty in meeting basic needs, higher fear of contamination, hedonism, less social support and loneliness resulted in a lower likelihood of being sustained resilient.

Conclusion

This study identified factors that predict sustained resilience in people with mental disorders. The newly discovered predictors of sustained resilience could prove invaluable in developing strategies to enhance the resilience of people with mental disorders during times of crises, such as pandemics.

Introduction

The COVID-19 pandemic was a source of stress shared by the world's population. Many studies have investigated the mental health consequences of this event, which, despite what we would have believed in 2020, continues to unfold and influence our lives (Penninx et al., 2022). The relative scarcity of longitudinal studies and the use of heterogeneous and not always validated assessment methods represent considerable limitations of the research on the impact of the pandemic on mental health (World Health Organization, 2022). For this reason, studies that longitudinally monitored the mental health status and coping attitudes of populations during the pandemic are particularly valuable (Cénat et al., 2022; Prati & Mancini, 2021; Robinson et al., 2022). A recent review of longitudinal studies, investigating
the sub-population of individuals with a psychiatric diagnosis before the pandemic, identified conflicting findings. Some studies reported improvements while others showed deteriorations of mental health compared to the pre-pandemic period (Ahmed et al., 2023; Kunzler et al., 2023).

In addition to the stress brought on by the pandemic, people with mental disorders may have encountered challenges related to government-imposed restrictions, difficulty accessing health care services, decreased physical activity, social isolation, and occupational burden that may have contributed to the worsening of pre-existing clinical conditions (Carpiniello et al., 2020; Konrad et al., 2022; Nosè et al., 2023; Pompili et al., 2022), sometimes leading to the onset of suicidal ideation (Zhu et al., 2022). On the other hand, other studies revealed little impact of the pandemic on mental health of people with mental disorders (Pan et al., 2021; Penninx et al., 2022).

Research on resilient responses to stressful events is a strand of particular interest (Brooks et al., 2020; Chen & Bonanno, 2020; PeConga et al., 2020). Over time, there have been numerous definitions and ways of assessing resilience (Aburn et al., 2016; Bonanno, 2021; Bonanno et al., 2011; Bonanno & Diminich, 2013; Herrman et al., 2011; Kalisch et al., 2017). Although tools assessing self-reported resilience can be very helpful, in some cases a longitudinal assessment of the distress experienced relative to exposure to stressful events may be more appropriate and comprehensive. In this case, people who report less distress than others despite having experienced an identical stressful stimulus may be considered resilient (Bonanno, 2021; Bonanno et al., 2011; Galatzer-Levy et al., 2018; Harvey & Delfabbro, 2004; Tarsitani et al., 2022). It is crucial to enhance the factors that could lead to a sustained resilient response, especially in vulnerable groups (Tarsitani et al., 2022), as the COVID-19 pandemic set the specific circumstances for a worldwide, synchronous, and long-lasting source of stress (Kunzler et al., 2023).

Against this background, this study used longitudinal data from repeatedly assessed people during the first two years of the COVID-19 pandemic, focusing on participants with a history of mental disorder to:

1. identify a subgroup of participants showing sustained resilient outcomes.
2. analyse whether baseline variables such as socio-demographics, economic and housing status, changes in employment status, pandemic-related issues, chronic diseases, loneliness, social support, fear of contamination and personal values can predict belonging to the sustained resilience group.

**Methods**

Subjects and Procedures

The present study was part of a wider international project titled: Covid Mental health Survey “Mental health effects of the COVID-19 outbreak – a longitudinal international comparison” (COMET). Detailed information concerning this closed cohort and methodology can be found in the published protocol (OSF / COMET- COVID-19 Mental Health Survey, 2022).
In the present study, only participants replying “Yes” to the following question were included: “Before the start of the COVID-19 pandemic, has a doctor or other healthcare provider ever told you that you have a mental health condition?” (Yes/NO).

Participants were enrolled in 13 different countries: Australia, China, France, Germany, Indonesia, Italy, Netherlands, South Africa, Spain, Sweden, Switzerland, Turkey, and United Kingdom. Recruited online between May and July 2020, participants completed the survey after providing informed consent, and were asked permission to be contacted again for following waves of the questionnaire. Those who agreed to be contacted again received a personal link via email with an invitation to participate in the following four waves. The subsequent waves of the survey took place in September-October 2020, December 2020, March-April 2021 and May-July 2022. Inclusion criteria were an age of 18 or older, and the survey was available in 10 languages (Bahasa Indonesia, Cantonese, Dutch, English, French, Italian, German, Spanish, Swedish, and Turkish). The procedure and the aims of the study were reported at the beginning of the questionnaire. The informed consent was obtained online from all participants via a secure web link, and participants were free to withdraw without giving an explanation at any time with no consequences. The COMET study was approved by the Ethical Review Board of the Faculty of Behavioral and Movement Sciences of VU University Amsterdam (VCWE-2020-077), and by the local Ethical Committees of all the involved institutions (see Tarsitani et al., 2022).

All procedures followed were in accordance with the Helsinki Declaration.

Assessment

Information concerning socio-demographic characteristics (gender, age in years, education), economic and housing status (working before and during the pandemic, square meters of living space per person), pandemic-related issues (income reduction during the pandemic, opinion on government regulations and adherence to them, personal COVID-19 infection and of someone close, personal COVID-19 work exposure and of someone close, difficulties in obtaining basic needs due to the pandemic, willingness to vaccinate, conspiracy beliefs on the pandemic) and the presence of chronic somatic disease was collected.

Beyond socio-demographics, the following psychometric tools were administered:

The Patient Health Questionnaire – 9 items (PHQ-9)(Kroenke & Spitzer, 2002) is a 9-item self-report questionnaire to check for depressive symptoms and depressive disorders over the previous two weeks. The overall score ranges from 0 to 27, with items scoring on a 0 to 3 Likert scale. Higher scores indicate more severe levels of depressive symptoms. With a sensitivity of 0.77 (0.71–0.84) and a specificity of 0.94 (0.90–0.97), PHQ-9 demonstrates good psychometric qualities (Kroenke & Spitzer, 2002). Validated or official versions were accessible in Chinese (Yeung et al., 2008), English (Kroenke & Spitzer, 2002), French (Carballeira et al., 2007), German (Löwe et al., 2003), Indonesian (Budikayanti et al., 2019), and Turkish (Konkan et al., 2013). The translated versions that may be downloaded from the PHQ website (www.phqscreeners.com) were used for Italian, Spanish, and Swedish.
The Generalized Anxiety Disorder scale – 7 items (GAD-7) (Spitzer et al., 2006) is a 7-item rating scale with a 0–3 Likert scale for each item and a 0–21 range for the total score. Higher scores reflect greater anxiety symptoms during the last two weeks. The GAD-7 showed good psychometric properties (Spitzer et al., 2006). Validated or official versions were accessible in English (Spitzer et al., 2006), French (Micoulaud-Franchi et al., 2016), German (Löwe et al., 2008), Indonesian (Budikayanti et al., 2019), Spanish (Garcia-Campayo et al., 2010), and Turkish (Konkan et al., 2013). The translated versions that may be downloaded from the PHQ website (www.phqscreeners.com) were used for Chinese, Italian, and Swedish.

The PTSD checklist DSM-5–4 items (PCL-5) (Price et al., 2016) is a 4-item scale assessing post-traumatic stress symptoms over the previous week. Items were scored on a 0 to 4 Likert scale. Higher scores indicate higher level of PTSD symptoms. Validated or official versions were accessible in English (Price et al., 2016), French (Ashbaugh et al., 2016), German (Krüger-Gottschalk et al., 2017), Indonesian (Susanty et al., 2021), Swedish (Sveen et al., 2016), and Turkish (Boysan et al., 2017). Through a process of duplicate translation and reconciliation, followed by an independent verification of the similarity between the final versions, the questionnaire was translated into the other languages that were used.

The Oslo Social Support Scale (OSSS-3) (Kocalevent et al., 2018) is a 3-item scale assessing the level of social support with a total score ranging from 3 to 14. By counting the number of people the respondent feels close to, the interest and worry others have for them, and how simple it is to get practical assistance from others, it measures many aspects of social support. English version was available, the questionnaire was translated in the other languages with the methodology described above. Loneliness was investigated through an item added to this scale: “Do you feel lonely?“.

The Padua inventory (Burns et al., 1996) is a 10-item subscale of the Padua Inventory a scale assessing obsessive compulsive symptoms with a 5-point Likert scale. The administered subscale focuses on contamination fear. Validated or official versions were accessible in English (Burns et al., 1996), French (Kaiser et al., 2010), German (Universität Bonn, 2002), Spanish (Mataix-Cols et al., 2002) and Turkish (Yorulmaz et al., 2007); the questionnaire was translated in the other languages with the methodology described above.

The Portrait Values Questionnaire – 11 items (PVQ-11) (Schwartz et al., 2001) is a 11-items scale measuring ten fundamental value orientations (power, achievement, hedonism, stimulation, self-direction, universalism, benevolence, tradition, conformity, security). Participants are asked “How much like you is this person?” for each portrait corresponding to a value and check one of six boxes labelled: very much like me, like me, somewhat like me, a little like me, not like me, and not at all like me at all. The World Values Survey displays the eleven selected items (http://www.worldvaluessurvey.org/wvs.jsp). The scores of the values have been ipsatized as commonly done when analyzing Schwartz values (Rudnev, 2021).

For details on the above-mentioned clinical scales and on how predictor variables were generated, see (Tarsitani et al., 2022) .
Statistical analysis

Among participants who reported pre-pandemic mental health disorder, those who completed at least three out of five surveys were included in the analysis. Scores from GAD-7, PHQ-9, and PCL-5 were used to create a latent score that would give indication of a resilient response as in previous publication (Tarsitani et al., 2022).

A variant of the Mover-Stayer Latent Transition Analysis model (Goodman, 1961) was used. Four categories of participants were identified for each timepoint: Stayers (Group 1), including participants who showed “sustained-resilience” (the only category remaining constant across timepoints), and three Movers categories: “Vulnerable”, “Intermediate”, and “Resilient not belonging to the sustained-resilience class”. Figure 1 is a graphical representation of our model: sustained resilient were forced to remain into the resilient class in each of the five time-points, while movers were free to switch between classes at different timepoints.

Continuous variables were described as mean ± Standard Deviation (SD) in the case of descriptive statistics, or Standard Error of the Mean (SEM) in the case of latent class indicators, whereas absolute frequencies and percentages were reported for categorical variables. Our outcome of interest was belonging to the sustained-resilient group, and it was predicted through a logistic regression model, estimating the odds ratio (OR), and relative 95% confidence intervals (CI). A one-step method procedure was adopted to take uncertainty of individual class allocation into account, i.e.: the class solution and the prediction for class membership were estimated simultaneously. All variables described in the method section were used as possible predictors.

We compared the distribution of variables at baseline of included participants with groups of excluded participants separately: participants with a mental health disorder excluded for insufficient assessments and participants with no mental health disorder. In both cases, we performed the Mann-U-Whitney test for continuous and Chi-square for categorical variables, and the Bonferroni-Hochberg correction was used to take multiplicity of tests into account.

For all hypotheses tested, two-sided p-values were used to evaluate the statistical significance. P-values less than 0.05 were considered significant.

Analyses were performed using MPlus (Muthén & Muthén, 2017) and Stata 17 (StataCorp, 2021).

Results

Of 8,011 participants who participated in the first wave, 1,711 (21.36%) reported a previous mental disorder. Of these, 943 individuals participated in at least three of the five waves of the questionnaire and were included in the present analysis. Seventy-five participants were excluded from the final analysis due to missing values in predictors, which led to a final sample of 868 participants. Baseline characteristics of the sample are described in Table 1. Baseline characteristics of participants who had not been
diagnosed with a mental disorder before the pandemic (and participating in at least three assessments) showed, as expected, lower levels of psychological distress during the pandemic (Table 1). The same table also describes the baseline characteristics of participants with a mental disorder prior to the pandemic who were excluded from the final sample for not having participated in at least three assessments. There were no significant differences between these groups in most non-clinical variables. The scores of the three clinical scales (GAD, PHQ and PCL-5) however, are higher in the group of patients excluded for insufficient assessments.
Table 1
Baseline characteristics of the included sample, of participants with no mental disorder prior to the pandemic and of participants with a previous mental disorder but excluded for insufficient number of assessments.

<table>
<thead>
<tr>
<th></th>
<th>Included participants</th>
<th>Participants without mental disorders</th>
<th>Participants with previous mental disorder excluded for insufficient assessments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mean (SD)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age in Years</td>
<td>41.6 (14.9)</td>
<td>41.3 (16.0)</td>
<td>41.2 (14.5)</td>
</tr>
<tr>
<td>Home squared meters</td>
<td>98.88 (55.01)</td>
<td>101.24 (50.97)</td>
<td>104.80 (56.44)</td>
</tr>
<tr>
<td>Oslo Social Support Score-3 score</td>
<td>8.931 (2.401)</td>
<td>9.660 (2.252)***</td>
<td>8.777 (2.433)</td>
</tr>
<tr>
<td>Padua Inventory score</td>
<td>22.124 (9.002)</td>
<td>22.403 (8.892)</td>
<td>23.621 (9.946)*</td>
</tr>
<tr>
<td>Patient Health Questionnaire-9 score</td>
<td>11.215 (7.168)</td>
<td>6.315 (5.343)***</td>
<td>12.152 (7.083)*</td>
</tr>
<tr>
<td>General Anxiety Disorder Scale score</td>
<td>8.773 (5.776)</td>
<td>4.928 (4.504)**</td>
<td>9.914 (6.036)**</td>
</tr>
<tr>
<td>PTSD checklist DSM-5 - PCL5 score</td>
<td>5.552 (3.908)</td>
<td>3.379 (3.181)***</td>
<td>6.569 (4.070)**</td>
</tr>
<tr>
<td><strong>n/N (%)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female gender</td>
<td>797/927 (86.0%)</td>
<td>2,530/3,256 (77.7%)***</td>
<td>630/763 (82.57%)</td>
</tr>
<tr>
<td>University degree</td>
<td>555/942 (58.9%)</td>
<td>2,247/3,282 (68.5%)***</td>
<td>397/767 (51.76%)</td>
</tr>
<tr>
<td>Number of people in the household</td>
<td>2.52 (1.31)</td>
<td>2.71 (1.32)***</td>
<td>2.64 (1.36)</td>
</tr>
<tr>
<td>Having a job before and after the pandemic start****</td>
<td>628/937 (67.02%)</td>
<td>2,314/3,277 (70.61%)</td>
<td>490/765 (64.05%)</td>
</tr>
<tr>
<td>Losing job during pandemic****</td>
<td>113/937 (12.06%)</td>
<td>349/3,277 (18.74%)</td>
<td>125/765 (16.34%)</td>
</tr>
<tr>
<td>No job before the pandemic</td>
<td>196/937 (20.92%)</td>
<td>614/3,277 (10.65%)</td>
<td>150/765 (19.61%)</td>
</tr>
<tr>
<td>Experienced an income reduction</td>
<td>280/938 (29.85%)</td>
<td>1,021/3,244 (31.47%)</td>
<td>315/761 (41.39%)***</td>
</tr>
</tbody>
</table>

*p-value < 0.05; ** p-value < 0.01; *** p-value < 0.001

**** Employment status was considered as one global variable
<table>
<thead>
<tr>
<th>Activity</th>
<th>Included participants</th>
<th>Participants without mental disorders</th>
<th>Participants with previous mental disorder excluded for insufficient assessments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approving COVID-19 restrictions</td>
<td>793/941 (84.27%)</td>
<td>2,820/3,271 (86.21%)</td>
<td>612/765 (80.00%)</td>
</tr>
<tr>
<td>Adhering to COVID-19 restrictions</td>
<td>641/936 (68.48%)</td>
<td>2,208/3,264 (67.65%)</td>
<td>478/763 (62.65%)</td>
</tr>
<tr>
<td>Going outdoor</td>
<td>636/938 (67.80%)</td>
<td>2,029/3,275 (61.95%)</td>
<td>448/767 (58.41%)</td>
</tr>
<tr>
<td>Knowing infected people</td>
<td>455/939 (48.46%)</td>
<td>1,557/3,277</td>
<td>308/765 (40.26%)</td>
</tr>
<tr>
<td>COVID-19 job exposure</td>
<td>256/943 (27.15%)</td>
<td>730/3,286 (22.22%)</td>
<td>226/768 (29.43%)</td>
</tr>
<tr>
<td>Close person with COVID-19 job exposure</td>
<td>338/943 (35.84%)</td>
<td>1,123/3,286 (34.18%)</td>
<td>264/768 (34.38%)</td>
</tr>
<tr>
<td>Difficulties in meeting basic needs</td>
<td>339/943 (35.95%)</td>
<td>859/3,286 (26.14%)</td>
<td>265/768 (34.51%)</td>
</tr>
<tr>
<td>Close person with difficulties meeting basic needs</td>
<td>177/943 (18.77%)</td>
<td>512/3,286 (15.58%)</td>
<td>148/768 (19.27%)</td>
</tr>
<tr>
<td>Chronic medical condition</td>
<td>337/943 (35.74%)</td>
<td>749/3,286 (22.79%)</td>
<td>284/768 (36.98%)</td>
</tr>
<tr>
<td>Feeling lonely</td>
<td>358/943 (37.96%)</td>
<td>538/3,277 (16.42%)</td>
<td>294/766 (38.38%)</td>
</tr>
<tr>
<td>Portrait Value Questionnaire</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-Direction</td>
<td>-0.701 (1.225)</td>
<td>-0.588 (1.122)**</td>
<td>-0.593 (1.221)</td>
</tr>
<tr>
<td>Security</td>
<td>-0.314 (1.267)</td>
<td>-0.108 (1.143)**</td>
<td>-0.515 (1.205)**</td>
</tr>
<tr>
<td>Hedonism</td>
<td>0.023 (1.132)</td>
<td>-0.236 (1.066)**</td>
<td>0.125 (1.157)</td>
</tr>
<tr>
<td>Benevolence</td>
<td>-1.074 (0.905)</td>
<td>-0.896 (0.838)**</td>
<td>-0.999 (0.932)</td>
</tr>
<tr>
<td>Achievement</td>
<td>0.244 (1.188)</td>
<td>0.273 (1.089)</td>
<td>0.249 (1.201)</td>
</tr>
<tr>
<td>Stimulation</td>
<td>0.886 (1.199)</td>
<td>0.759 (1.130)**</td>
<td>0.813 (1.225)</td>
</tr>
</tbody>
</table>

*p-value < 0.05; ** p-value < 0.01; *** p-value < 0.001

**** Employment status was considered as one global variable
The sample, the majority of which were women and had a very high level of education, had an average age of 41.6 years. More than one third of the included sample reported having a chronic medical condition. Most of the participants included had a job and held it at least at the beginning of the pandemic. However, about one tenth lost it in the first few months of the pandemic and about one third of the included sample suffered a reduction in salary. There was broad agreement and observation of restrictions to contain infection. Almost 40% of the included participants reported difficulties in obtaining basic needs during the pandemic and a similar percentage reported feeling lonely.

The means and Standard Error of the Mean (S.E.M.) presented on the scales for the assessment of depressive, anxiety, and post-traumatic stress symptoms for each class are shown in Table 2. The right-hand column shows the mean scores on the three scales of the participants in the sustained resilient group, our outcome of interest.

The estimated probability of being part of the sustained resilient group was 24.85%. Table 3 shows the estimated percentage, among movers, of participants belonging to each class at each time point.
Table 3
Estimated percentage of movers \(^1\) belonging to each class for each wave

<table>
<thead>
<tr>
<th>Wave</th>
<th>Vulnerable</th>
<th>Intermediate</th>
<th>Resilient</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>18.00%</td>
<td>31.26%</td>
<td>50.74%</td>
</tr>
<tr>
<td>Second</td>
<td>16.33%</td>
<td>23.18%</td>
<td>60.49%</td>
</tr>
<tr>
<td>Third</td>
<td>17.66%</td>
<td>26.79%</td>
<td>55.54%</td>
</tr>
<tr>
<td>Fourth</td>
<td>16.79%</td>
<td>27.00%</td>
<td>56.21%</td>
</tr>
<tr>
<td>Fifth</td>
<td>14.29%</td>
<td>21.11%</td>
<td>64.61%</td>
</tr>
</tbody>
</table>

\(^1\) Movers: participants who could switch between classes at different timepoints

Among the socio-demographic characteristics and psychological variables, the following were found to be associated with a higher chance to be in the group of sustained resilient, with an Odds Ratio (OR) significantly above 1: older age (OR 1.045, p-value < 0.001, CI 1.025–1.066), a higher number of people in the household (OR 1.279, p-value 0.020, CI 1.041–1.572), as well as maintaining a job during the pandemic (OR 1.855, CI 1.013–3.401 vs no job before the pandemic). As for this last result, working status before and after the pandemic start turned out as globally significant (p-value 0.002), with the lowest odds of being sustained resilient for losing job during the pandemic (OR 0.529, CI 0.209–1.304 vs no job before the pandemic).

Female gender (OR 0.452, p-value 0.010, CI 0.247–0.830), facing difficulties in finding basic needs (OR 0.369, p-value 0.001, CI 0.208–0.655), higher baseline scores of contamination fear (OR 0.906, p-value < 0.001, CI 0.873–0.941), lower scores of baseline social support (OR 1.277, p-value < 0.001, CI 1.117–1.458), feeling lonely (OR 0.175, p-value < 0.001, CI 0.093–0.329), a higher focus of personal values on the hedonic dimensions (OR 0.771, p-value < 0.001, CI 0.598–0.995) determined significantly lower odds of being part of the sustained resilient group.

Results of the logistic regression are shown in Table 4.
Table 4
Results of multiple logistic regression to predict sustained resilience among included participants*

<table>
<thead>
<tr>
<th>Factor</th>
<th>Odds ratio</th>
<th>Confidence interval</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female gender</td>
<td>0.452</td>
<td>0.247–0.830</td>
<td>0.010</td>
</tr>
<tr>
<td>Age in years</td>
<td>1.045</td>
<td>1.025–1.066</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>University degree</td>
<td>1.309</td>
<td>0.812–2.110</td>
<td>0.269</td>
</tr>
<tr>
<td>Number of people in the household</td>
<td>1.279</td>
<td>1.041–1.572</td>
<td>0.020</td>
</tr>
<tr>
<td>Home square meters</td>
<td>0.995</td>
<td>0.990–1.0003</td>
<td>0.065</td>
</tr>
<tr>
<td>Reference group: No job before the pandemic</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Working before and after pandemic start</td>
<td>1.855</td>
<td>1.013–3.401</td>
<td>0.002</td>
</tr>
<tr>
<td>Losing job during pandemic</td>
<td>0.529</td>
<td>0.209–1.304</td>
<td></td>
</tr>
<tr>
<td>Income reduction</td>
<td>1.323</td>
<td>0.808–2.165</td>
<td>0.266</td>
</tr>
<tr>
<td>Chronic medical condition</td>
<td>0.613</td>
<td>0.362–1.038</td>
<td>0.069</td>
</tr>
<tr>
<td>Approving COVID-19 restrictions</td>
<td>1.764</td>
<td>0.851–3.650</td>
<td>0.127</td>
</tr>
<tr>
<td>Adhering to COVID-19 restrictions</td>
<td>1.224</td>
<td>0.692–2.165</td>
<td>0.488</td>
</tr>
<tr>
<td>Going outdoor</td>
<td>0.647</td>
<td>0.386–1.086</td>
<td>0.099</td>
</tr>
<tr>
<td>Knowing infected people</td>
<td>0.896</td>
<td>0.527–1.524</td>
<td>0.685</td>
</tr>
<tr>
<td>COVID-19 personal job exposure</td>
<td>1.227</td>
<td>0.702–2.146</td>
<td>0.472</td>
</tr>
<tr>
<td>Close person with COVID-19 job exposure</td>
<td>1.034</td>
<td>0.641–1.669</td>
<td>0.889</td>
</tr>
<tr>
<td>Difficulties in meeting basic needs</td>
<td>0.369</td>
<td>0.208–0.655</td>
<td>0.001</td>
</tr>
<tr>
<td>Close person with difficulties meeting basic needs</td>
<td>0.584</td>
<td>0.293–1.164</td>
<td>0.127</td>
</tr>
<tr>
<td>Willingness to get vaccinated</td>
<td>1.105</td>
<td>0.620–1.969</td>
<td>0.736</td>
</tr>
<tr>
<td>Baseline Padua Inventory score</td>
<td>0.906</td>
<td>0.873–0.941</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Feeling lonely</td>
<td>0.175</td>
<td>0.093–0.329</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Baseline OSSS-3 score</td>
<td>1.277</td>
<td>1.117–1.458</td>
<td>&lt; 0.001</td>
</tr>
</tbody>
</table>

*Results related to statistically significant predictors marked in bold

Availability of data and materials

The data that support the findings of this study are available from the COMET Consortium. Data are available upon reasonable request to the Corresponding Author, Dr. Irene Pinucci (irene.pinucci@uniroma1.it), who will forward your request to the COMET Consortium for its approval.
<table>
<thead>
<tr>
<th></th>
<th>Odds ratio</th>
<th>Confidence interval</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PVQ1 centered (Self-direction)</td>
<td>0.949</td>
<td>0.733–1.229</td>
<td>0.691</td>
</tr>
<tr>
<td>PVQ3 centered (Security)</td>
<td>0.948</td>
<td>0.710–1.264</td>
<td>0.715</td>
</tr>
<tr>
<td>PVQ4 centered (Hedonism)</td>
<td>0.771</td>
<td>0.598–0.995</td>
<td>0.046</td>
</tr>
<tr>
<td>PVQ5-6 centered (Benevolence)</td>
<td>1.024</td>
<td>0.731–1.435</td>
<td>0.890</td>
</tr>
<tr>
<td>PVQ7 centered (Achievement)</td>
<td>1.043</td>
<td>0.787–1.381</td>
<td>0.769</td>
</tr>
<tr>
<td>PVQ8 centered (Stimulation)</td>
<td>0.865</td>
<td>0.635–1.179</td>
<td>0.360</td>
</tr>
<tr>
<td>PVQ9 centered (Conformity)</td>
<td>1.007</td>
<td>0.782–1.297</td>
<td>0.954</td>
</tr>
<tr>
<td>PVQ11 centered (Tradition)</td>
<td>0.940</td>
<td>0.719–1.229</td>
<td>0.651</td>
</tr>
<tr>
<td>Conspiracy beliefs</td>
<td>0.818</td>
<td>0.597–1.120</td>
<td>0.210</td>
</tr>
</tbody>
</table>

*Results related to statistically significant predictors marked in bold*

**Availability of data and materials**

The data that support the findings of this study are available from the COMET Consortium. Data are available upon reasonable request to the Corresponding Author, Dr. Irene Pinucci (irene.pinucci@uniroma1.it), who will forward your request to the COMET Consortium for its approval.

**Discussion**

This two-year longitudinal study investigated the mental health impact of the COVID-19 pandemic in people with a mental disorder across nations. A latent class of sustained resilient participants was identified over time in approximately one quarter of the sample. These individuals, compared to the other participants in the study, showed a psychological adaptation maintained over time despite the stress imposed by the pandemic and the pre-existing mental disorder and different predictors of being sustained resilient were highlighted.

Older individuals had a larger likelihood of sustained resilience. These findings are in line with previous studies, from which it emerged that the older population tends to show more resilience than younger individuals in face of sustained stressors (Bonanno & Diminich, 2013; MacLeod et al., 2016; Tarsitani et al., 2022). Older patients with a mental disorder confirm this trend.

Lack of social support and feelings of loneliness resulted in a lower likelihood of remaining resilient over time. These findings are consistent with other studies on the consequences of social isolation due to the COVID-19 pandemic in people with mental disorders, which found a negative impact on psychiatric symptomatology and sleep quality (Ma et al., 2020). Other authors highlighted the close relations between lack of social support, loneliness, and resilience to imposed restrictions (Li et al., 2021; Szkody et al., 2021). In particular, higher levels of distress in response to social isolation were shown in individuals...
with mental disorders (Konrad et al., 2022). In accordance, a higher number of people in the household was associated with sustained resilient outcomes. Living with others predicted resilience, despite the available space.

Women showed a lower likelihood of sustained resilience. Previous studies carried out during the COVID-19 pandemic have identified greater psychological distress among women than men (Vindegaard & Benros, 2020; Xiong et al., 2020). Some factors could explain this difference, for example a higher exposure to COVID-19 in the working environment, childcare responsibilities during the lockdown, greater work instability, and higher exposure to domestic violence (Tibubos et al., 2021).

Employment status played a crucial role in determining sustained resilience: participants who kept a previous employment were more likely to be sustained resilient. This finding is corroborated by the lower probability to be resilient in participants who lost their job during the pandemic. Employment difficulties are a common challenge in psychiatric patients (Adler et al., 2006; Burton et al., 2004; Henderson et al., 2011) and the pandemic hampered the employment situation of this vulnerable population (Pompili et al., 2022). This is to be expected considering the mental health consequences of unemployment in the general population as well (de Miquel et al., 2022; Purba et al., 2021; Ruengorn et al., 2021). The protective role of a job when coping with a mental disorder may not be linked to financial stability only, but also to social interaction (even online), motivation for daily planning, and existential purpose.

Greater fear of contamination was associated with a lower likelihood of sustained resilience in participants with a mental disorder. Contamination fear during the pandemic was found to have consequences for well-being and reduced the number of primary healthcare visits (Alhalal et al., 2022). A recent review examined the consequences of the pandemic on Obsessive-Compulsive Disorder (OCD). Despite the heterogeneity of the results, an increase in OCD symptoms was found in patients diagnosed with OCD diagnosis prior to the pandemic, suggesting a pandemic-related stress effect. Washers and cleaners seem to have suffered more because of this phenomenon (Linde et al., 2022). A worsening of symptoms was also described during the second wave of the pandemics, compared to the first (Benatti et al., 2022). Although no information concerning the number of participants diagnosed with an OCD was available in the included sample, we can hypothesize that the stress caused by the pandemic could have a role in worsening the OCD spectrum symptomatology as the fear of contamination, affecting resilient resources of these patients.

Participants with a higher hedonism score, meaning they give pleasure and enjoyment a higher value than others, were less likely in the sustained-resilient group. This conclusion supports recent findings of our research group in chronically medically ill, albeit diverging from the literature on the role of hedonism in other areas (Tarsitani et al., 2022). For instance, hedonism was linked to positive mental health in university students (Maercker et al., 2015) and in soldiers following military deployment (Zimmermann et al., 2014). However, these assessments were not made during a global crisis. It is possible that during the COVID-19 pandemic people who prioritize satisfaction and enjoyment especially suffered from the
constraints that disrupted their habits. Participants who experience additional restrictions on engaging in pleasurable activities because of their mental disorder may be particularly disadvantaged.

Strengths and limitations

The longitudinal design of the study, with five waves consistently assessing the same variables during the various phases of the COVID-19 pandemic, the large sample size from thirteen different countries and the use of validated scales to assess mental distress are its major strengths.

The following limitations should be acknowledged: first, the way the sample was recruited does not make it representative of the general population. The self-selection of participants represents an important source of bias, strengthened by the language barrier bias. The majority of the participants were well educated and had access to the internet, as is frequently the case in samples gathered through social media and snowball sampling. The sample is distinguished by a significant proportion of middle-aged women as well. It should be taken into account that a large percentage (44.3%) of participants reporting to have a previous mental disorder did not complete at least three of the five assessments and were not included in the final sample. Participants more inclined to engage and participate in a study and be contacted again may tend to respond differently compared to those who choose not to respond. The scores of the clinical scales of these participants seem to confirm this potential source of bias.

Finally, the self-reported presence/absence of a diagnosis of mental disorder may be another source of response bias that goes hand in hand with the lack of other clinical information.

Conclusion

In this study, we investigated the predictors of sustained resilience in an international sample with a self-reported pre-pandemic diagnosis of mental disorder. A resilient response to the global stress of a pandemic was more likely to be maintained over time in older individuals, and those who kept their job. Moreover, individuals who experienced less loneliness and who shared their home environment with more people were more likely to belong to the sustained resilient group. On the other hand, women, participants with greater fear of contamination and difficulty meeting basic needs, as well as those whose value system was more focused on hedonism were less resilient. The new information gathered could be a useful starting point in the development of tools to enhance a resilient response to a major source of stress in vulnerable individuals such as people with a mental disorder.

Declarations

Conflict of interest

The authors declare that they have no conflict of interest.
Authors’ contribution

MS and MP developed the international project concept and provided data collection with IP and CP. IP, LT, CB and FT developed the concept of the study design. FT provided data curation, analysis design and statistical analysis. IP, FT and LT provided the original draft, revised by all co-authors. All co-authors contributed in the data collection for each country and in the final revision of the draft.

Funding

The COMET project is now part of the RESPOND project (https://respond-project.eu/) which is funded under Horizon 2020 – the Framework Programme for Research and Innovation (2014–2020) Societal Challenges under Grant Agreement No 101016127.

Author Contribution

MS and MP developed the international project concept and provided data collection with IP and CP. IP, LT, CB, FT and RS developed the concept of the study design. FT provided data curation, analysis design and statistical analysis. IP, FT and LT provided the original draft, revised by all co-authors. All co-authors contributed in the data collection for each country and in the final revision of the draft.

Acknowledgments

We thank all the participants who generously shared their time and personal information.

References


45. OSF / COMET-COVID-19 mental health survey. (2022)


58. StataCorp (2021) Stata Statistical Software: Release 17. StataCorp LLC, College Station, TX


**Figures**

Figure 1

Graphical representation of the Mover-Stayer model