



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

I. Pinucci¹ · F. Tedeschi² · R. Serra^{1,3} · M. Patané² · C. Acartürk⁴ · D. Andriani⁵ · R. A. Bryant⁶ · S. Burchert⁷ · G. Caggiu⁸ · D. Campos^{9,10} · C. Conflitti¹¹ · C. Davige-Paturet¹² · M. Felez-Nobrega^{13,14} · D. Fuhr^{15,16} · B. J. Hall¹⁷ · J. M. Haro^{13,14} · A. C. Huizink² · C. Knaevelsrud⁷ · G. Kurt^{4,34} · A. Lam¹⁸ · I. Leijen¹⁹ · R. Mediavilla^{20,21,22} · M. Melchior¹² · E. Mittendorfer-Rutz²³ · N. Morina²⁴ · M. Monzio Compagnoni¹¹ · P. Nicaise²⁵ · C. Palantza^{3,33} · C. Panter-Brick²⁶ · D. Papola^{3,27} · S. Quero^{28,29} · C. Rodriguez Prada^{21,22} · S. Seedat³⁰ · H. Setyowibowo⁵ · P. Smith^{26,31} · J. van der Waerden¹² · H. Walter³² · A. Witteveen² · M. Pasquini¹ · M. Sijbrandij² · C. Barbui³ · L. Tarsitani¹

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Abstract

Background During the COVID-19 pandemic, the global population was exposed to a significant psychological stress, which had an impact on the mental health in individuals with pre-existing mental disorders. Despite their heightened vulnerability, subgroups within this population demonstrated resilient outcomes throughout the pandemic. This study aims to identify predictors of long-term, sustained resilient outcomes 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 resilient outcomes, 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 resilient outcomes 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 presenting sustained resilient outcomes.

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

Keywords COVID-19 pandemic · Mental disorders · Resilience · Stress · Prospective cohort study

C. Barbui and L. Tarsitani are Joint last authors.

Extended author information available on the last page of the article

Introduction

Covid-19 and vulnerable populations.

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 [1–4]. 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 [5].

Exploring the psychopathological consequences of the pandemic in individuals with mental disorders is both a sensitive and essential undertaking. Beyond the direct stress induced by the pandemic itself, government-imposed restrictions had side consequences on areas which constitute a challenge for people with mental disorders, even in non-pandemic times. These include limited access to health care services, reduced opportunities for physical activity, social isolation, and increased occupational burden. Such stressors have likely contributed to the worsening of pre-existing clinical conditions [6–10], even increasing the risk of suicidality onset in this population [11]. The need to focus on psychopathological consequences of the pandemic in psychiatric patients stems from the pre-existence of specific vulnerabilities, predating the pandemic. Indeed, individuals with mental disorders endure high levels of loneliness and social isolation even in the absence of a global crisis [12]. Furthermore, occupational challenges have long been related to significant stress in this population [13–16]. The barriers faced by psychiatric patients in integrating into society and the workforce were already well-documented before the pandemic and remain pressing concerns in its aftermath.

On top of that, during the pandemic people with mental disorders were also at a higher risk of SARS-CoV-2 infection, severe illness, and COVID-19-related mortality compared to the general population [17].

For these reasons studies that have focused on mental health outcomes of the COVID-19 pandemic in people with mental disorders are particularly valuable and show how this population faced a particularly challenging source of stress, with population-specific consequences in terms of worsening of depression-, anxiety-, and stress-related symptoms, sleeping quality, socio-economic status, quality of life, and suicidal ideation [7, 8, 18–26].

Assessing resilience

Research on resilient responses to stressful events is a growing branch of research [27–29]. Over time, there have been numerous definitions and ways of assessing resilience [30–35]. The definition used in the present study was given by Bonanno and colleagues (2004), who described resilience as a “stable trajectory of healthy functioning across time” [36]. To assess a resilient response across time there are two primary methods. The first involves the use of self-report questionnaires, which typically assess individual traits such as personality, attitudes, behaviors, and coping mechanisms. These instruments often capture a limited range of variables and tend to have low predictive value [31, 33, 37]. The second method focuses on analyzing individuals’ psychological response patterns during exposure to adversity. In this approach, individuals are considered resilient if they consistently exhibit minimal or no stress-related symptoms (such as depression, anxiety, or post-traumatic stress) over time. Predictive factors are then identified through prospective, multivariable prediction models [31, 33, 38–40]. While tools assessing self-reported resilience can be very helpful, the prospective assessment of the distress experienced due to exposure to stressful events may be more appropriate and comprehensive. In this case, people who report less distress than others despite having experienced the same stressful situation may be considered more resilient.

It is crucial to enhance the factors that could lead to a sustained resilient response, especially in vulnerable groups [40], as the COVID-19 pandemic set the specific circumstances for a worldwide, synchronous, and long-lasting source of stress [22]. Moreover, enhancing resilience responses to stressful stimuli has shown to improve the quality of life in people with mental disorders [41].

Hypothesis and outcomes of interest

As mentioned, vulnerability in people with a psychiatric diagnosis stem both in their diagnosis and in the context surrounding the consequences of the pandemic. Considering the difficulties reported by patients with mental disorders during the pandemic [8, 18–26], it is essential to assess the factors that can protect these patients from a worsening of their clinical condition, favoring instead resilient pathways that promote their mental health.

However, studies focusing on predicting resilience to the stress caused by the pandemic in psychiatric populations are scarce, and available literature is limited to exploring determined psychiatric diagnoses (e.g. eating disorders [42]) or specific subpopulations (e.g. veterans [43]). In these studies, the authors demonstrated that factors such as isolation, fear of contagion, perceived poor quality of therapeutic

connections, lower levels of perceived social support, and reduced satisfaction with relationships with friends and family were significant predictors of worse mental health outcomes during the COVID-19. Interestingly, a greater endorsement of positive behavioural adaptations was associated with more resilient mental health outcomes to pandemic-related stress within these samples [42, 43].

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 reported history of mental disorder to:

- (1) Compare the differences in terms of anxiety, depressive, and post-traumatic stress symptoms between the subgroup of individuals who reported having a mental disorder and those who did not.
- (2) Identify among participants with mental disorders a subgroup of participants showing sustained resilient outcomes.
- (3) 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 resilient outcomes group in people with mental disorders

Our hypothesis is that, as highlighted by a study conducted in the context of the same international project on patients with chronic medical conditions [40] and partially shown by other authors in specific subgroups, certain socio-demographic determinants (e.g., age, gender), housing status, work-life situation, pandemic-related issues, chronic diseases, higher loneliness and scarce social support, lower fear of contamination and certain personal values may be predictors of sustained resilient outcome in a group of people with mental disorders.

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 the project and methodology can be found in the published protocol (OSF| COMET- COVID-19 Mental Health Survey, [44]). The goal of the project was to evaluate predictors of the course of mental health symptoms during the COVID-19 pandemic. To this end, as part of the

international longitudinal COMET project, numerous socio-demographic, environmental, COVID-related, and psychopathological variables were collected over the course of five different evaluations spaced over two years in a large sample of subjects recruited via the Internet.

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 [40]).

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, income reduction during the pandemic), pandemic-related issues (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) [45] 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 [45]. Validated or official versions were accessible in Chinese [46], English [45], French [47], German [48], Indonesian [49], and Turkish [50]. 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) [51] 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 proprieties [51]. Validated or official versions were accessible in English [51], French [52], German [53], Indonesian [49], Spanish [54], and Turkish [50]. 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) [55] 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 [55], French [56], German [57], Indonesian [58], Swedish [59], and Turkish [60]. 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) [61] 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 [62] 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 [62], French [63], German (Universität [64]), Spanish [65] and Turkish [66], the questionnaire was translated in the other languages with the methodology described above.

The Portrait Values Questionnaire– 11 items (PVQ-11) [67] 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 [68].

For details on the above-mentioned clinical scales and on how predictor variables were generated, see [40].

Statistical analysis

Latent indicator of resilient outcomes

Among participants who reported pre-pandemic mental health disorders, 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 indicator that would give indication of a resilient outcome [40]. The previously described approach, which aims at identifying people reporting low or no distress over time amid adversity, was used to conceptualize resilient outcomes [31, 33, 36, 38, 39]. We did not employ perceived stress scales, which assess anxiety and depressive symptoms individuals attribute to stress. Instead, we directly evaluated the impact of the COVID-19 pandemic– a shared and specific source of stress at the time of the assessment– focusing on the three most common clinical manifestations of stress: depression, anxiety and post-traumatic symptoms.

According to the prototypical trajectories conceptualized by Bonanno (chronic, remitted, delayed, resilient) [36] we focused specifically on individuals exhibiting a “resilient” trajectory—characterized by minimal or no stress symptoms over time—to examine the most resilient individuals within people with a history of mental disorder.

The mover-stayer latent transition analysis model

An indicator of resilient outcomes was developed using the GAD, PHQ and PCL scores. Based on these scores in each of the five time points, participants may be classified into one of three latent classes: “vulnerable outcomes”, “intermediate outcomes” or “resilient outcomes”. A variant of the Mover-Stayer Latent Transition Analysis model [69] was used, and participants were divided in two groups based on this allocation. Movers could be in any of the three classes at any given timepoint, and Stayers could only be in the

resilient outcomes class at each of the five timepoints. Four categories of participants were identified for each timepoint: Stayers, or participants who showed “sustained resilient outcomes” (the only category remaining constant across timepoints), and three Movers categories: “Vulnerable”, “Intermediate”, and “Resilient outcomes not belonging to the sustained-resilient outcomes class”.

Figure 1 is a graphical representation of our model: sustained resilient outcomes remained into the resilient outcomes class in each of the five time-points, while movers could switch between classes at different timepoints.

A broader explanation of the statistical model can be found in [40].

Sustained resilient outcomes

Continuous variables were described as mean $\pm$ 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. As possible predictors of being in the sustained resilient outcomes group we analyzed variables 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, income reduction during the pandemic), pandemic-related issues (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), presence of chronic somatic disease were used together with the scores from The Oslo Social Support Scale (OSSS-3), the Padua inventory and the Portrait Values Questionnaire.

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.

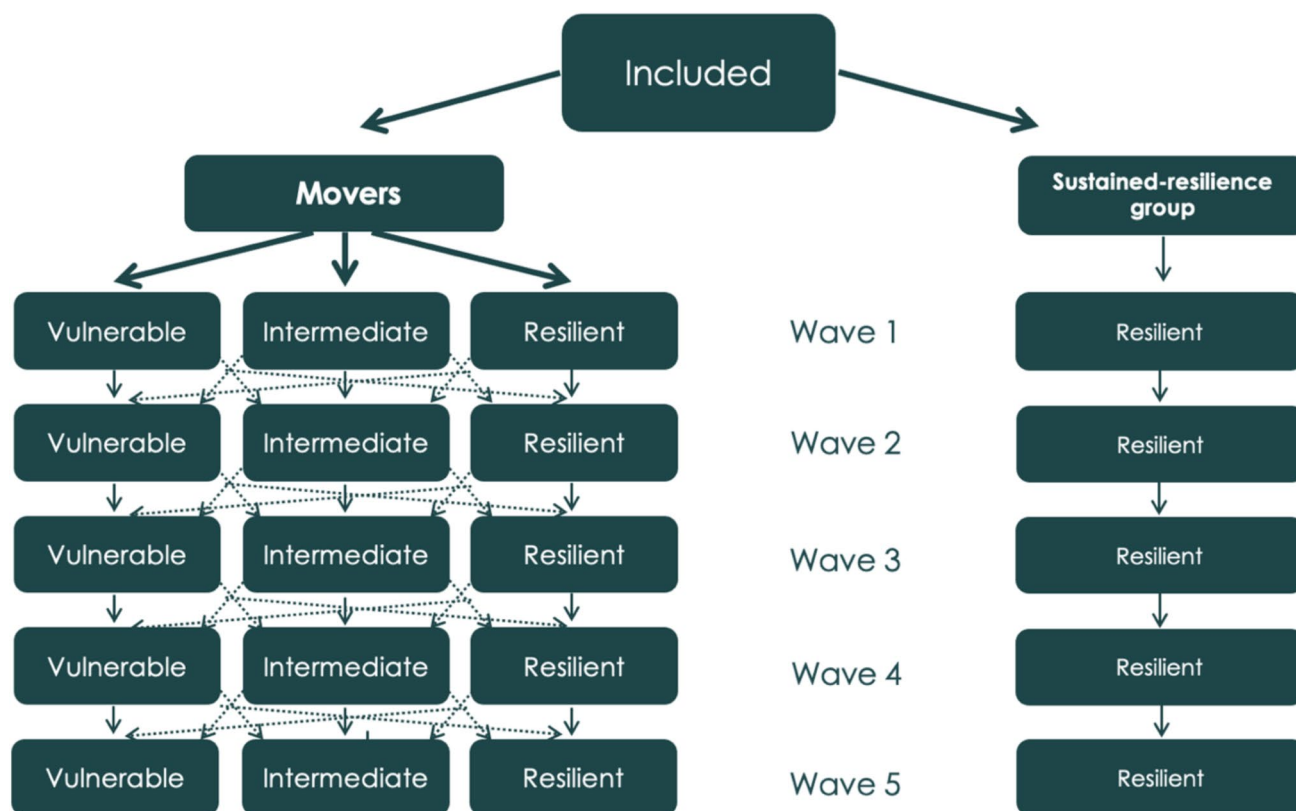


Fig. 1 Graphical representation of the Mover-Stayer model

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 [70] and Stata 17 [71].

Results

Baseline characteristics of the included sample

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. The sample, the majority of which were women and had a university 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 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.

Baseline characteristics of people with vs without mental disorders

Baseline characteristics of participants who had not been diagnosed with a mental disorder before the pandemic (and participating in at least three assessments) showed lower levels of psychological distress during the pandemic (Table 1). Participants who reported not having been diagnosed with a mental disorder by a mental health professional showed significantly lower scores on the Patient Health Questionnaire-9 (mean = 6.31, SD = 5.34), the Generalized Anxiety Disorder Scale (mean = 4.93, SD = 4.50), and the PTSD Checklist (mean = 3.38, SD = 3.2), compared to those with a reported diagnosis (all p-values < 0.001).

Baseline characteristics of people with mental disorders included in the sample vs excluded for insufficient participation

Table 1 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.

Latent indicator of resilient outcome

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 outcomes group, our outcome of interest.

The estimated probability of being part of the sustained resilient outcomes group was 24.85%. Table 3 shows the estimated percentage, among movers, of participants belonging to each class at each time point.

Predictors of sustained resilient outcomes.

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 outcomes, 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 having sustained outcomes 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 outcomes group.

Results of the logistic regression are shown in Table 4.

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

	Included participants	Participants without mental disorders	Participants with previous mental disorder excluded for insufficient assessments
	Mean (SD)		
Age in Years	41.6 (14.9)	41.3 (16.0)	41.2 (14.5)
Home squared meters	98.88 (55.01)	101.24 (50.97)	104.80 (56.44)
Oslo Social Support Score-3 score	8.931 (2.401)	9.660 (2.252)***	8.777 (2.433)
Padua Inventory score	22.124 (9.002)	22.403 (8.892)	23.621 (9.946)*
Patient Health Questionnaire-9 score	11.215 (7.168)	6.315 (5.343)***	12.152 (7.083)*
General Anxiety Disorder Scale score	8.773 (5.776)	4.928 (4.504)***	9.914 (6.036)***
PTSD checklist DSM-5—PCL5 score	5.552(3.908)	3.379 (3.181)***	6.569 (4.070)***
	n/N (%)		
Female gender	797/927 (86.0%)	2,530/3,256 (77.7%)***	630/763 (82.57%)
University degree	555/942 (58.9%)	2,247/3,282 (68.5%)***	397/767 (51.76%)*
Number of people in the household	2.52 (1.31)	2.71 (1.32)***	2.64 (1.36)
Having a job before and after the pandemic start****	628/937 (67.02%)	2,314/3,277 (70.61%)	490/765 (64.05%)
Losing job during pandemic****	113/937 (12.06%)	349/3,277 (18.74%)	125/765 (16.34%)
No job before the pandemic	196/937 (20.92%)	614/3,277 (10.65%)	150/765 (19.61%)
Experienced an income reduction	280/938 (29.85%)	1,021/3,244 (31.47%)	315/761 (41.39%)***
Approving COVID-19 restrictions	793/941 (84.27%)	2,820/3,271 (86.21%)	612/765 (80.00%)
Adhering to COVID-19 restrictions	641/936 (68.48%)	2,208/3,264 (67.65%)	478/763 (62.65%)*
Going outdoor	636/938 (67.80%)	2,029/3,275 (61.95%)**	448/767 (58.41%)***
Knowing infected people	455/939 (48.46%)	1,557/3,277	308/765 (40.26%)**
COVID-19 job exposure	256/943 (27.15%)	730/3,286 (22.22%)**	226/768 (29.43%)
Close person with COVID-19 job exposure	338/943 (35.84%)	1,123/3,286 (34.18%)	264/768 (34.38%)
Difficulties in meeting basic needs	339/943 (35.95%)	859/3,286 (26.14%)***	265/768 (34.51%)
Close person with difficulties meeting basic needs	177/943 (18.77%)	512/3,286 (15.58%)*	148/768 (19.27%)
Chronic medical condition	337/943 (35.74%)	749/3,286 (22.79%)***	284/768 (36.98%)
Feeling lonely	358/943 (37.96%)	538/3,277 (16.42%)***	294/766 (38.38%)
Portrait Value Questionnaire			
Self-Direction	-0.701 (1.225)	-0.588 (1.122)**	-0.593 (1.221)
Security	-0.314 (1.267)	-0.108 (1.143)***	-0.515 (1.205)**
Hedonism	0.023 (1.132)	-0.236 (1.066)***	0.125 (1.157)
Benevolence	-1.074 (0.905)	-0.896 (0.838)***	-0.999 (0.932)
Achievement	0.244 (1.188)	0.273 (1.089)	0.249 (1.201)
Stimulation	0.886 (1.199)	0.759 (1.130)**	0.813 (1.225)
Conformity	-0.431 (1.270)	-0.344 (1.133)*	-0.278 (1.324)
Tradition	0.994 (1.355)	0.756 (1.248)***	0.905 (1.423)

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

**** Employment status was considered as one global variable

Table 2 Mean and S.E.M. of resilience indicators in each latent class*

	Vulnerable	Intermediate	Resilient	Sustained-resilience class
	Mean (S.E.M.)	Mean (S.E.M.)	Mean (S.E.M.)	Mean (S.E.M.)
PHQ Total score	21.048 (0.567)	13.702 (0.504)	7.253 (0.472)	3.537 (0.258)
GAD Total score	17.755 (0.266)	11.189 (0.599)	5.727 (0.356)	2.644 (0.249)
PCL Total score	10.708 (0.283)	6.638 (0.320)	3.468 (0.244)	1.615 (0.144)

*S.E.M. = Standard Error of the Mean. Means are constrained to be equal for each class across timepoints

Table 3 Estimated percentage of movers belonging to each class for each wave

Wave	Vulnerable	Intermediate	Resilient
First	18.00%	31.26%	50.74%
Second	16.33%	23.18%	60.49%
Third	17.66%	26.79%	55.54%
Fourth	16.79%	27.00%	56.21%
Fifth	14.29%	21.11%	64.61%

Movers: participants who could switch between classes at different timepoints

Table 4 Results of multiple logistic regression to predict sustained resilience among included participants

	Odds ratio	Confidence interval	P-value
Female gender	0.452	0.247–0.830	0.010
Age in years	1.045	1.025–1.066	< 0.001
University degree	1.309	0.812–2.110	0.269
Number of people in the household	1.279	1.041–1.572	0.020
Home square meters	0.995	0.990–1.0003	0.065
Reference group: No job before the pandemic			
Working before and after pandemic start	1.855	1.013–3.401	0.002
Losing job during pandemic	0.529	0.209–1.304	
Income reduction	1.323	0.808–2.165	0.266
Chronic medical condition	0.613	0.362–1.038	0.069
Approving COVID-19 restrictions	1.764	0.851–3.650	0.127
Adhering to COVID-19 restrictions	1.224	0.692–2.165	0.488
Going outdoor	0.647	0.386–1.086	0.099
Knowing infected people	0.896	0.527–1.524	0.685
COVID-19 personal job exposure	1.227	0.702–2.146	0.472
Close person with COVID-19 job exposure	1.034	0.641–1.669	0.889
Difficulties in meeting basic needs	0.369	0.208–0.655	0.001
Close person with difficulties meeting basic needs	0.584	0.293–1.164	0.127
Willingness to get vaccinated	1.105	0.620–1.969	0.736
Baseline Padua Inventory score	0.906	0.873–0.941	< 0.001
Feeling lonely	0.175	0.093–0.329	< 0.001
Baseline OSSS-3 score	1.277	1.117–1.458	< 0.001
PVQ1 centered (Self-direction)	0.949	0.733–1.229	0.691
PVQ3 centered (Security)	0.948	0.710–1.264	0.715
PVQ4 centered (Hedonism)	0.771	0.598–0.995	0.046
PVQ5-6 centered (Benevolence)	1.024	0.731–1.435	0.890
PVQ7 centered (Achievement)	1.043	0.787–1.381	0.769
PVQ8 centered (Stimulation)	0.865	0.635–1.179	0.360
PVQ9 centered (Conformity)	1.007	0.782–1.297	0.954
PVQ11 centered (Tradition)	0.940	0.719–1.229	0.651
Conspiracy beliefs	0.818	0.597–1.120	0.210

Results related to statistically significant predictors marked in bold

Discussion

This two-year longitudinal study investigated the mental health impact of the COVID-19 pandemic in people with a mental disorder across nations. People with a history of mental disorders showed higher levels of baseline distress compared to other participants. This finding was expected considering existing literature on the impact of the COVID-19 pandemic on individuals with mental disorders. People with mental disorders have experienced a general deterioration in mental health due to the pandemic, with increased severity of symptoms such as stress, anxiety, and depression [7, 8, 18–26].

Our outcome of main interest was to explore the presence of a subgroup of people with mental disorder who presented sustained resilient outcomes despite these stressors. A latent class of participants with sustained resilient outcomes was identified over time in approximately one quarter of the sample. These individuals, compared to the other participants in the study with mental disorders, showed a better psychological adaptation maintained over time despite the

stress imposed by the pandemic and the pre-existing mental disorder.

At this point, our following outcome of interest was to explore predictors of sustained resilient outcomes among people with mental disorders. Our analysis highlighted different predictors of this outcome that will be classified into socio-demographic characteristics, COVID-19-related factors, and personal values.

Socio-demographic characteristics predicting sustained resilient outcomes

It has been previously shown that older population tends to show more resilient outcomes than younger individuals in face of sustained stressors [32, 40, 72]. To our knowledge, no other studies explored the effect of age on mental health outcomes in people with mental disorders during the pandemic. In our sample, older individuals had a larger likelihood of sustained resilient outcomes.

Lack of social support and feelings of loneliness resulted in a lower likelihood of sustained resilient outcomes over

time as well. These findings are consistent with other studies focusing 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 [73]. Other authors highlighted the close relations between lack of social support, loneliness, and lack of resilience to imposed restrictions [74, 75]. In particular, higher levels of distress in response to social isolation were shown in individuals with mental disorders [8]. Our study is in line with these findings. Moreover, our results highlighted how a higher number of people in the household was associated with sustained resilient outcomes. Sharing a household with more people was associated with more sustained resilient outcomes, despite the resulting reduction in personal space.

Previous studies carried out during the COVID-19 pandemic have identified greater psychological distress among women than men [76, 77]. These results are in line with ours, women with mental disorders showed a lower likelihood of sustained resilient outcomes. 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 [78].

Employment status played a crucial role in determining sustained resilient outcomes: participants who kept a previous employment were more likely to present sustained resilient outcomes. This finding is corroborated by the lower probability to present resilient outcomes in participants who lost their job during the pandemic. Employment difficulties are a common challenge in psychiatric patients [13–16] and the pandemic hampered the employment situation of this vulnerable population [10]. This is to be expected, considering the mental health consequences of unemployment in the general population as well [79–81]. 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.

Covid-related factors predicting sustained resilient outcomes

Greater fear of contamination was associated with a lower likelihood of sustained resilient outcomes 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 [82]. 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 [83]. A worsening of symptoms was also described during the second wave of the pandemic, compared to the first [84]. 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.

Personal values predicting sustained resilient outcomes

Participants with a higher hedonism score, meaning they give pleasure and enjoyment a higher value than others, were less likely in the sustained resilient outcomes 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 [40]. For instance, hedonism was linked to positive mental health in university students [85] and in soldiers following military deployment [86]. 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. Although this method effectively reaches a wide number of respondents, it tends to favor those with higher levels of education and higher digital skills. The sample is distinguished by a significant proportion of middle-aged women as well, which may further restrict the generalizability of our results given that mental health outcomes can differ among age groups, gender

identities and socio-educational backgrounds. 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.

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 including the timing of the diagnosis. As a result, it is possible that some participants who answered “yes” to the question described in the Methods section had received their diagnosis a long time before the onset of the COVID-19 pandemic, which may have influenced the relevance or accuracy of their inclusion in the sample.

Finally, in this study, we did not examine the specific processes that contributed to the maintenance of minimal or no stress-related symptoms over time. Consequently, we cannot determine which mental, emotional, or behavioral adjustment strategies helped participants coping with the adversity of the COVID-19 pandemic. Rather, we identified individuals who exhibited “resilient outcomes,” and explored the variables associated with these outcomes.

Conclusion

In this study, we investigated the predictors of sustained resilient outcomes in an international sample with a self-reported pre-pandemic diagnosis of mental disorder. Resilient outcomes to the global stress of a pandemic were 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 outcomes 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 presented less resilient outcomes. 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.

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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.

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Declaration

Conflict of interest The authors declare no competing interests.

References

1. Cénat JM, Farahi SMMM, Dalexis RD, Darius WP, Bekarkhanechi FM, Poisson H, Broussard C, Ukwu G, Auguste E, Nguyen DD, Sehabi G, Furyk SE, Gedeon AP, Onesi O, El Aouame AM, Khodabocus SN, Shah MS, Labelle PR (2022) The global evolution of mental health problems during the COVID-19 pandemic: A systematic review and meta-analysis of longitudinal studies. *J Affect Disord* 315:70–95. <https://doi.org/10.1016/j.jad.2022.07.011>
2. Penninx BWJH, Benros ME, Klein RS, Vinkers CH (2022) How COVID-19 shaped mental health: from infection to pandemic effects. *Nat Med* 28(10):2027–2037. <https://doi.org/10.1038/s41591-022-02028-2>
3. Prati G, Mancini AD (2021) The psychological impact of COVID-19 pandemic lockdowns: a review and meta-analysis of longitudinal studies and natural experiments. *Psychol Med* 51(2):201–211. <https://doi.org/10.1017/S0033291721000015>
4. Robinson E, Sutin AR, Daly M, Jones A (2022) A systematic review and meta-analysis of longitudinal cohort studies comparing mental health before versus during the COVID-19 pandemic in 2020. *J Affect Disord* 296:567–576. <https://doi.org/10.1016/j.jad.2021.09.098>
5. World Health Organization (2022) Mental Health and COVID-19: Early evidence of the pandemic’s impact.
6. Carpiello B, Tusconi M, Zanalda E, di Sciascio G, di Giannantonio M (2020) Psychiatry during the Covid-19 pandemic: a survey on mental health departments in Italy. *BMC Psychiatry* 20(1):593. <https://doi.org/10.1186/s12888-020-02997-z>
7. Fleischmann E, Dalkner N, Fellendorf FT, Reininghaus EZ (2021) Psychological impact of the COVID-19 pandemic on individuals with serious mental disorders: A systematic review of the literature. *World Journal of Psychiatry* 11(12):1387–1406. <https://doi.org/10.5498/wjp.v11.i12.1387>
8. Konrad AC, Förster K, Kurtz M, Endrass T, Jauk E, Kanske P (2022) Social factors predict distress development in adults with pre-existing mental disorders during the coronavirus disease 2019 pandemic. *Front Psychol* 13. <https://doi.org/10.3389/fpsyg.2022.849650>
9. Nosè M, Gastaldon C, Acarturk C, Purgato M, Ostuzzi G, Barbui C (2023) Have the COVID-19 outbreak and related restrictions affected the right to mental health of people with severe mental

- health conditions? *Int Rev Psychiatry* 35(2):180–193. <https://doi.org/10.1080/09540261.2022.2145183>
10. Pompili M, Innamorati M, Sampogna G, Albert U, Carmassi C, Carrà G, Cirulli F, Erbutto D, Luciano M, Nanni MG, Sani G, Tortorella A, Viganò C, Volpe U, Fiorillo A (2022) The impact of Covid-19 on unemployment across Italy: Consequences for those affected by psychiatric conditions. *J Affect Disord* 296:59–66. <https://doi.org/10.1016/j.jad.2021.09.035>
 11. Zhu Y, Li Y, Xu X (2022) Suicidal ideation and suicide attempts in psychiatric patients during the COVID-19: A systematic review and meta-analysis. *Psychiatry Res* 317:114837. <https://doi.org/10.1016/j.psychres.2022.114837>
 12. Hajek A, Gyasi RM, Pengpid S, Peltzer K, Kostev K, Soysal P, Smith L, Jacob L, Veronese N, König H-H (2025) Prevalence of loneliness and social isolation amongst individuals with severe mental disorders: a systematic review and meta-analysis. *Epidemiology and Psychiatric Sciences* 34:e25. <https://doi.org/10.1017/S2045796025000228>
 13. Adler DA, McLaughlin TJ, Rogers WH, Chang H, Lapitsky L, Lerner D (2006) Job Performance Deficits Due to Depression. *Am J Psychiatry* 163(9):1569–1576. <https://doi.org/10.1176/ajp.2006.163.9.1569>
 14. Burton WN, Pransky G, Conti DJ, Chen C-Y, Edington DW (2004) The Association of Medical Conditions and Presenteeism. *J Occup Environ Med* 46(6):S38–S45. <https://doi.org/10.1097/01.jom.0000126687.49652.44>
 15. Franke AG, Schmidt P, Neumann S (2024) Association Between Unemployment and Mental Disorders: A Narrative Update of the Literature. *Int J Environ Res Public Health* 21(12):1698. <https://doi.org/10.3390/ijerph21121698>
 16. Henderson M, Harvey S, Øverland S, Mykletun A, Hotopf M (2011) Work and common psychiatric disorders. *J R Soc Med* 104(5):198–207. <https://doi.org/10.1258/jrsm.2011.100231>
 17. Bertolini F, Witteveen AB, Young S, Cuijpers P, Ayuso-Mateos JL, Barbui C, Cabello M, Cadorin C, Downes N, Franzoi D, Gasior ME, Gray B, John A, Melchior M, van Ommeren M, Palantza C, Purgato M, Van der Waerden J, Wang S, Sijbrandij M (2023) Risk of SARS-CoV-2 infection, severe COVID-19 illness and COVID-19 mortality in people with pre-existing mental disorders: an umbrella review. *BMC Psychiatry* 23(1):181. <https://doi.org/10.1186/s12888-023-04641-y>
 18. Asmundson GJG, Paluszczek MM, Landry CA, Rachor GS, McKay D, Taylor S (2020) Do pre-existing anxiety-related and mood disorders differentially impact COVID-19 stress responses and coping? *J Anxiety Disord* 74:102271. <https://doi.org/10.1016/j.janxdis.2020.102271>
 19. Celal Kefeli M, Akkus M (2023) Assessment of the psychological effect of the covid-19 pandemic on patients with generalized anxiety disorder. *Psychiatr. Danub* 35(1), 97–102. <https://doi.org/10.24869/psyd.2023.97>
 20. Gilsbach S, Herpertz-Dahlmann B, Konrad K (2021) Psychological Impact of the COVID-19 Pandemic on Children and Adolescents With and Without Mental Disorders. *Frontiers in Public Health* 9. <https://doi.org/10.3389/fpubh.2021.679041>
 21. Hao F, Tan W, Jiang L, Zhang L, Zhao X, Zou Y, Hu Y, Luo X, Jiang X, McIntyre RS, Tran B, Sun J, Zhang Z, Ho R, Ho C, Tam W (2020) Do psychiatric patients experience more psychiatric symptoms during COVID-19 pandemic and lockdown? A case-control study with service and research implications for immunopsychiatry. *Brain Behav Immun* 87:100–106. <https://doi.org/10.1016/j.bbi.2020.04.069>
 22. Kunzler AM, Lindner S, Röhke N, Schäfer SK, Metzendorf M-I, Sachkova A, Müller-Eberstein R, Klinger C, Burns J, Coenen M, Lieb K (2023) Mental Health Impact of Early Stages of the COVID-19 Pandemic on Individuals with Pre-Existing Mental Disorders: A Systematic Review of Longitudinal Research. *Int J Environ Res Public Health* 20(2):948. <https://doi.org/10.3390/ijerph20020948>
 23. Liu CH, Stevens C, Conrad RC, Hahm HC (2020) Evidence for elevated psychiatric distress, poor sleep, and quality of life concerns during the COVID-19 pandemic among U.S. young adults with suspected and reported psychiatric diagnoses. *Psychiatry Res* 292, 113345. <https://doi.org/10.1016/j.psychres.2020.113345>
 24. Rao ER, Satish S (2021) A comparative study of perceived stress and anxiety, among patients with bipolar affective disorder, and the general population, during COVID-19 pandemic, conducted in government hospital for mental care, Visakhapatnam. *Journal of Evidence Based Medicine and Healthcare*, 8(17): 1169–1173. <https://doi.org/10.18410/jebmh/2021/225>
 25. Šagud M, Janović MB, Čusa ZV, Jakšić N, Krakan LB, Begić D, Grubišić J, Janović Š, Jevtović S, Kosanović Rajačić B, Mamić G, Mikulić SK, Marčinko D, Peleš AM, Lisak MŠ, Štimac Z, Živković M, Čusa BV, Wang W (2023) Depression and stress levels in patients with different psychiatric disorders during concurrent early-phase COVID-19 pandemic and earthquake in Croatia. *BMC Psychiatry* 23(1):798. <https://doi.org/10.1186/s12888-023-05302-w>
 26. Skoda E-M, Bäuerle A, Schweda A, Dörrie N, Musche V, Hetkamp M, Kohler H, Teufel M, Weismüller B (2021) Severely increased generalized anxiety, but not COVID-19-related fear in individuals with mental illnesses: A population based cross-sectional study in Germany. *Int J Soc Psychiatry* 67(5):550–558. <https://doi.org/10.1177/0020764020960773>
 27. Brooks S, Amlôt R, Rubin GJ, Greenberg N (2020) Psychological resilience and post-traumatic growth in disaster-exposed organisations: overview of the literature. *BMJ Military Health* 166(1):52–56. <https://doi.org/10.1136/jramc-2017-000876>
 28. Chen S, Bonanno GA (2020) Psychological adjustment during the global outbreak of COVID-19: A resilience perspective. *Psychol Trauma Theory Res Pract Policy* 12(S1):S51–S54. <https://doi.org/10.1037/tra0000685>
 29. PeConga EK, Gauthier GM, Holloway A, Walker RSW, Rosencrans PL, Zoellner LA, Bedard-Gilligan M (2020) Resilience is spreading: Mental health within the COVID-19 pandemic. *Psychol Trauma Theory Res Pract Policy* 12(S1):S47–S48. <https://doi.org/10.1037/tra0000874>
 30. Aburn G, Gott M, Hoare K (2016) What is resilience? An Integrative Review of the empirical literature. *J Adv Nurs* 72(5):980–1000. <https://doi.org/10.1111/jan.12888>
 31. Bonanno GA (2021) The resilience paradox. *Eur J Psychotraumatol* 12(1). <https://doi.org/10.1080/2008198.2021.1942642>
 32. Bonanno GA, Diminich ED (2013) Annual Research Review: Positive adjustment to adversity - trajectories of minimal-impact resilience and emergent resilience. *J Child Psychol Psychiatry* 54(4):378–401. <https://doi.org/10.1111/jcpp.12021>
 33. Bonanno GA, Westphal M, Mancini AD (2011) Resilience to Loss and Potential Trauma. *Annu Rev Clin Psychol* 7(1):511–535. <https://doi.org/10.1146/annurev-clinpsy-032210-104526>
 34. Herrman H, Stewart DE, Diaz-Granados N, Berger EL, Jackson B, Yuen T (2011) What is Resilience? *The Canadian Journal of Psychiatry* 56(5):258–265. <https://doi.org/10.1177/070674371105600504>
 35. Kalisch R, Baker D, Basten U, Boks M, Bonanno G, A., Brummelman E., Chmitorz A., Fernández G., Fiebach C. J., Galatzer-Levy I., Geuze E., Groppa S., Helmreich I., Hender T., Hermans E. J., Jovanovic T., Kubiak T., Lieb K., Lutz B., ... Kleim B. (2017). The resilience framework as a strategy to combat stress-related disorders. *Nature Human Behaviour*, 1(11), 784–790. <https://doi.org/10.1038/s41562-017-0200-8>
 36. Bonanno GA (2004) Loss, Trauma, and Human Resilience: Have We Underestimated the Human Capacity to Thrive After

- Extremely Aversive Events? *Am Psychol* 59(1):20–28. <https://doi.org/10.1037/0003-066X.59.1.20>
37. Bonanno GA, Chen S, Bagrodia R, Galatzer-Levy IR (2024) Resilience and Disaster: Flexible Adaptation in the Face of Uncertain Threat. *Annu Rev Psychol* 75(1):573–599. <https://doi.org/10.1146/annurev-psych-011123-024224>
 38. Galatzer-Levy IR, Huang SH, Bonanno GA (2018) Trajectories of resilience and dysfunction following potential trauma: A review and statistical evaluation. *Clin Psychol Rev* 63:41–55. <https://doi.org/10.1016/j.cpr.2018.05.008>
 39. Harvey J, Delfabbro P (2004) Psychological resilience in disadvantaged youth: A critical overview. *Aust Psychol* 39(1):3–13. <https://doi.org/10.1080/00050060410001660281>
 40. Tarsitani L, Pinucci I, Tedeschi F, Patanè M, Papola D, Palantza C, Accarturk C, Björkenstam E, Bryant R, Burchert S, Davigge-Paturet C, Díaz-García A, Farrel R, Fuhr DC, Hall BJ, Huizink AC, Lam AIF, Kurt G, Leijen I, Barbui C (2022) Resilience of people with chronic medical conditions during the COVID-19 pandemic: a 1-year longitudinal prospective survey. *BMC Psych*, 22(1): 633. <https://doi.org/10.1186/s12888-022-04265-8>
 41. Chuang SP, Wu JYW, Wang CS (2023) Resilience and Quality of Life in People with Mental Illness: A Systematic Review and Meta-Analysis. *Neuropsychiatr Dis Treat* 19:507–514. <https://doi.org/10.2147/NDT.S392332>
 42. Monteleone AM, 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 MG, Pinna F, 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. *Eating and Weight Disorders - Studies on Anorexia, Bulimia and Obesity*, 26(8): 2443–2452. <https://doi.org/10.1007/s40519-020-01097-x>
 43. Marquardt CA, Chu C, Hill JE, Venables NC, Kuzenski L, Davenport ND, Disner SG, Finn JA, Gilmore CS, Erbes CR, Urošević S (2023) Evaluating resilience in response to COVID-19 pandemic stressors among veteran mental health outpatients. *Journal of Psychopathology and Clinical Science* 132(1):26–37. <https://doi.org/10.1037/abn0000789>
 44. OSF| COMET- COVID-19 mental health survey (2022)
 45. Kroenke K, Spitzer RL (2002) The PHQ-9: A New Depression Diagnostic and Severity Measure. *Psychiatr Ann* 32(9):509–515. <https://doi.org/10.3928/0048-5713-20020901-06>
 46. Yeung A, Fung F, Yu S-C, Vorono S, Ly M, Wu S, Fava M (2008) Validation of the Patient Health Questionnaire-9 for depression screening among Chinese Americans. *Compr Psychiatry* 49(2):211–217. <https://doi.org/10.1016/j.comppsy.2006.06.002>
 47. Carballeira Y, Dumont P, Borgacci S, Rentsch D, Tonnac N, Archinard M, Andreoli A (2007) Criterion validity of the French version of Patient Health Questionnaire (PHQ) in a hospital department of internal medicine. *Psychol Psychother Theory Res Pract* 80(1):69–77. <https://doi.org/10.1348/147608306X103641>
 48. Löwe B, Spitzer L, Zipfel S, Herzog W (2003) Gesundheitsfragebogen für Patienten (PHQ D). *Zeitschrift Für Medizinische Psychologie*.
 49. Budikayanti A, Larasari A, Malik K, Syeban Z, Indrawati LA, Octaviana F (2019) Screening of Generalized Anxiety Disorder in Patients with Epilepsy: Using a Valid and Reliable Indonesian Version of Generalized Anxiety Disorder-7 (GAD-7). *Neurol Res Int* 2019:1–10. <https://doi.org/10.1155/2019/5902610>
 50. Konkan R, Şenormancı Ö, Güçlü O, Aydin E, Z. Sungur M (2013) Yaygın Anksiyete Bozukluğu-7 (YAB-7) Testi Türkçe Uyarlaması, Geçerlik ve Güvenirliği. *Nöro Psikiyatri Arşivi*, 50(1), 53–58. <https://doi.org/10.4274/npa.y6308>
 51. Spitzer RL, Kroenke K, Williams JBW, Löwe B (2006) A Brief Measure for Assessing Generalized Anxiety Disorder. *Arch Intern Med* 166(10):1092. <https://doi.org/10.1001/archinte.166.10.1092>
 52. Micoulaud-Franchi J-A, Lagarde S, Barkate G, Dufournet B, Besancon C, Trébuchon-Da Fonseca A, Gavaret M, Bartolomei F, Bonini F, McGonigal A (2016) Rapid detection of generalized anxiety disorder and major depression in epilepsy: Validation of the GAD-7 as a complementary tool to the NDDI-E in a French sample. *Epilepsy Behav* 57:211–216. <https://doi.org/10.1016/j.yebeh.2016.02.015>
 53. Löwe B, Decker O, Müller S, Brähler E, Schellberg D, Herzog W, Herzberg PY (2008) Validation and Standardization of the Generalized Anxiety Disorder Screener (GAD-7) in the General Population. *Med Care* 46(3):266–274. <https://doi.org/10.1097/MR.0b013e318160d093>
 54. Garcia-Campayo J, Zamorano E, Ruiz MA, Pardo A, Perez-Paramo M, Lopez-Gomez V, Freire O, Rejas J (2010) Cultural adaptation into Spanish of the generalized anxiety disorder-7 (GAD-7) scale as a screening tool. *Health Qual Life Outcomes* 8(1):8. <https://doi.org/10.1186/1477-7525-8-8>
 55. Price M, Szafranski DD, van Stolk-Cooke K, Gros DF (2016) Investigation of abbreviated 4 and 8 item versions of the PTSD Checklist 5. *Psychiatry Res* 239:124–130. <https://doi.org/10.1016/j.psychres.2016.03.014>
 56. Ashbaugh AR, Houle-Johnson S, Herbert C, El-Hage W, Brunet A (2016) Psychometric Validation of the English and French Versions of the Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-5). *PLoS ONE* 11(10):e0161645. <https://doi.org/10.1371/journal.pone.0161645>
 57. Krüger-Gottschalk A, Knaevelsrud C, Rau H, Dyer A, Schäfer I, Schellong J, Ehring T (2017) The German version of the Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-5): psychometric properties and diagnostic utility. *BMC Psychiatry* 17(1):379. <https://doi.org/10.1186/s12888-017-1541-6>
 58. Susanty E, Sijbrandij M, Srisayekti W, Huizink AC (2021) Eye Movement Desensitization (EMD) to reduce posttraumatic stress disorder-related stress reactivity in Indonesia PTSD patients: a study protocol for a randomized controlled trial. *Trials* 22(1):181. <https://doi.org/10.1186/s13063-021-05100-3>
 59. Sveen J, Bondjers K, Willebrand M (2016) Psychometric properties of the PTSD Checklist for DSM-5: a pilot study. *Eur J Psychotraumatol* 7(1):30165. <https://doi.org/10.3402/ejpt.v7.30165>
 60. Boysan M, Guzel Ozdemir P, Ozdemir O, Selvi Y, Yilmaz E, Kaya N (2017) Psychometric properties of the Turkish version of the PTSD Checklist for Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (PCL-5). *Psychiatry Clin Psychopharmacol* 27(3), 300–310. <https://doi.org/10.1080/24750573.2017.1342769>
 61. Kocalevent R-D, Berg L, Beutel ME, Hinz A, Zenger M, Härter M, Nater U, Brähler E (2018) Social support in the general population: standardization of the Oslo social support scale (OSSS-3). *BMC Psychology* 6(1):31. <https://doi.org/10.1186/s40359-018-0249-9>
 62. Burns GL, Keortge SG, Formea GM, Sternberger LG (1996) Revision of the Padua Inventory of obsessive compulsive disorder symptoms: Distinctions between worry, obsessions, and compulsions. *Behav Res Ther* 34(2):163–173. [https://doi.org/10.1016/0005-7967\(95\)00035-6](https://doi.org/10.1016/0005-7967(95)00035-6)
 63. Kaiser B, Bouvard M, Milliery M (2010) Laveurs, vérificateurs, ruminateurs: spécificité des croyances dysfonctionnelles, des obsessions et des compulsions? *L'Encéphale* 36(1):54–61. <https://doi.org/10.1016/j.encep.2008.09.003>
 64. Universität Bonn (2002) Padua Inventory-Washington State University Revised (PI-WSUR). Abteilung Für Neuropsychologie Des Universitätsklinikums Bonn.

65. Mataix-Cols D, Sánchez-Turet M, Vallejo J (2002) A spanish version of the padua inventory: factor structure and psychometric properties. *Behav Cogn Psychother* 30(1):25–36. <https://doi.org/10.1017/S1352465802001042>
66. Yorulmaz O, Karancı A, Dirik G, Baştuğ B, Kısa C, Göka E, Burns G (2007) Padua Envanteri-Washington Eyalet Üniversitesi Revizyonu: Türkçe Versiyonunun Psikometrik Özellikleri. *Türk Psikoloji Yazıları*.
67. Schwartz SH, Melech G, Lehmann A, Burgess S, Harris M, Owens V (2001) Extending the Cross-Cultural Validity of the Theory of Basic Human Values with a Different Method of Measurement. *J Cross Cult Psychol* 32(5):519–542. <https://doi.org/10.1177/0022022101032005001>
68. Rudnev M (2021) Caveats of non-ipsatization of basic values: A review of issues and a simulation study. *J Res Pers* 93:104118. <https://doi.org/10.1016/j.jrp.2021.104118>
69. Goodman L (1961) Statistical methods for the mover-stayer model. *J Am Stat Assoc* 56:841–868
70. Muthén LK, Muthén BO (2017) *Mplus User's Guide* (Eight edition). Muthén & Muthén
71. StataCorp (2021) *Stata Statistical Software: Release 17*. College Station, TX: StataCorp LLC.
72. MacLeod S, Musich S, Hawkins K, Alsgaard K, Wicker ER (2016) The impact of resilience among older adults. *Geriatr Nurs* 37(4):266–272. <https://doi.org/10.1016/j.gerinurse.2016.02.014>
73. Ma J, Hua T, Zeng K, Zhong B, Wang G, Liu X (2020) Influence of social isolation caused by coronavirus disease 2019 (COVID-19) on the psychological characteristics of hospitalized schizophrenia patients: a case-control study. *Transl Psychiatry* 10(1):411. <https://doi.org/10.1038/s41398-020-01098-5>
74. Li F, Luo S, Mu W, Li Y, Ye L, Zheng X, Xu B, Ding Y, Ling P, Zhou M, Chen X (2021) Effects of sources of social support and resilience on the mental health of different age groups during the COVID-19 pandemic. *BMC Psychiatry* 21(1):16. <https://doi.org/10.1186/s12888-020-03012-1>
75. Szkody E, Stearns M, Stanhope L, McKinney C (2021) Stress-Buffering Role of Social Support during COVID-19. *Fam Process* 60(3):1002–1015. <https://doi.org/10.1111/famp.12618>
76. Vindegaard N, Benros ME (2020) COVID-19 pandemic and mental health consequences: Systematic review of the current evidence. *Brain Behav Immun* 89:531–542. <https://doi.org/10.1016/j.bbi.2020.05.048>
77. Xiong J, Lipsitz O, Nasri F, Lui LMW, Gill H, Phan L, Chen-Li D, Jacobucci M, Ho R, Majeed A, McIntyre RS (2020) Impact of COVID-19 pandemic on mental health in the general population: A systematic review. *J Affect Disord* 277:55–64. <https://doi.org/10.1016/j.jad.2020.08.001>
78. Tibubos AN, Otten D, Ernst M, Beutel ME (2021) A systematic review on Sex- and Gender-Sensitive research in public mental health during the first wave of the COVID-19 crisis. *Front Psychiatry* 12. <https://doi.org/10.3389/fpsy.2021.712492>
79. de Miquel C, Domènech-Abella J, Felez-Nobrega M, Cristóbal-Narváez P, Mortier P, Vilagut G, Alonso J, Olaya B, Haro JM (2022) The Mental Health of Employees with Job Loss and Income Loss during the COVID-19 Pandemic: The Mediating Role of Perceived Financial Stress. *Int J Environ Res Public Health* 19(6):3158. <https://doi.org/10.3390/ijerph19063158>
80. Purba FD, Kumalasari AD, Novianti LE, Kendhawati L, Noer AH, Ninin RH (2021) Marriage and quality of life during COVID-19 pandemic. *PLoS ONE* 16(9):e0256643. <https://doi.org/10.1371/journal.pone.0256643>
81. Ruengorn C, Awiphan R, Wongpakaran N, Wongpakaran T, Nochaiwong S (2021) Association of job loss, income loss, and financial burden with adverse mental health outcomes during coronavirus disease 2019 pandemic in Thailand: A nationwide cross-sectional study. *Depress Anxiety* 38(6):648–660. <https://doi.org/10.1002/da.23155>
82. Alhalal E, Alkhair Z, Alghazal F, Muhaimed F, Halabi R (2022) Fear of contamination among older adults in the post-COVID-19 era. *Geriatr Nurs* 48:1–7. <https://doi.org/10.1016/j.gerinurse.2022.08.010>
83. Linde ES, Varga TV, Clotworthy A (2022) Obsessive-compulsive disorder during the COVID-19 pandemic—a systematic review. *Front Psychiatry*, 13. <https://doi.org/10.3389/fpsy.2022.806872>
84. Benatti B, Albert U, Maina G, Celebre L, Girone N, Bramante S, Rigardetto S, Viganò C, Dell'Osso B (2022) First vs second wave of COVID-19 pandemic in patients with obsessive compulsive disorder: A multicentre report from tertiary clinics in Northern Italy. *J Psychiatr Res* 154:293–299. <https://doi.org/10.1016/j.jpsy.2022.07.058>
85. Maercker A, Chi Zhang X, Gao Z, Kochetkov Y, Lu S, Sang Z, Yang S, Schneider S, Margraf J (2015) Personal value orientations as mediated predictors of mental health: A three-culture study of Chinese, Russian, and German university students. *Int J Clin Health Psychol* 15(1):8–17. <https://doi.org/10.1016/j.ijchp.2014.06.001>
86. Zimmermann P, Firnkes S, Kowalski JT, Backus J, Siegel S, Willmund G, Maercker A (2014) Personal values in soldiers after military deployment: Associations with mental health and resilience. *Eur J Psychotraumatol* 5(SUPPL). <https://doi.org/10.3402/ejpt.v5.22939>

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Authors and Affiliations

I. Pinucci¹  · F. Tedeschi² · R. Serra^{1,3} · M. Patané² · C. Acartürk⁴ · D. Andriani⁵ · R. A. Bryant⁶ · S. Burchert⁷ · G. Caggiu⁸ · D. Campos^{9,10} · C. Conflitti¹¹ · C. Davige-Paturet¹² · M. Felez-Nobrega^{13,14} · D. Fuhr^{15,16} · B. J. Hall¹⁷ · J. M. Haro^{13,14} · A. C. Huizink² · C. Knaevelsrud⁷ · G. Kurt^{4,34} · A. Lam¹⁸ · I. Leijen¹⁹ · R. Mediavilla^{20,21,22} · M. Melchior¹² · E. Mittendorfer-Rutz²³ · N. Morina²⁴ · M. Monzio Compagnoni¹¹ · P. Nicaise²⁵ · C. Palantza^{3,33} · C. Panter-Brick²⁶ · D. Papola^{3,27} · S. Quero^{28,29} · C. Rodriguez Prada^{21,22} · S. Seedat³⁰ · H. Setyowibowo⁵ · P. Smith^{26,31} · J. van der Waerden¹² · H. Walter³² · A. Witteveen² · M. Pasquini¹ · M. Sijbrandij²  · C. Barbuli³  · L. Tarsitani¹ 

✉ L. Tarsitani
lorenzo.tarsitani@uniroma1.it

¹ Department of Human Neurosciences, Sapienza University of Rome, Rome, Italy

² Department of Clinical, Neuro-, and Developmental Psychology and WHO Collaborating Center for Research and Dissemination of Psychological Interventions, Vrije Universiteit, Amsterdam, The Netherlands

³ WHO Collaborating Centre for Research and Training in Mental Health and Service Evaluation, Department of Neurosciences, Biomedicine and Movement Sciences, Section of Psychiatry, University of Verona, Verona, Italy

⁴ Department of Psychology, Koç University, Istanbul, Türkiye

⁵ Department of Psychology, Faculty of Psychology, Universitas Padjadjaran, Bandung, Indonesia

⁶ School of Psychology, University of New South Wales, Sydney, Australia

⁷ Department of Education and Psychology, Freie Universität Berlin, Berlin, Germany

⁸ Department of Mental Health and Addiction Services, ASST Lecco, Lombardy Region, Lecco, Italy

⁹ Department of Psychology and Sociology, University of Zaragoza, Huesca, Spain

¹⁰ Instituto de Investigación Sanitaria Aragón (IIS Aragón), Zaragoza, Spain

¹¹ Department of Statistics and Quantitative Methods, University of Milano-Bicocca, Milan, Italy

¹² Sorbonne Université, INSERM, Institut Pierre Louis d'Epidémiologie Et de Santé Publique, IPLESP, Equipe de Recherche en Epidémiologie Sociale, ERES, 75012 Paris, France

¹³ Parc Sanitari Sant Joan de Déu, Institut Sant Joan de Déu, Sant Boi de Llobregat, Barcelona, Spain

¹⁴ Centro de Investigación Biomédica en Red (CIBER)– Salud Mental, Sant Boi de Llobregat, Barcelona, Spain

¹⁵ Leibniz Institute of Prevention Research and Epidemiology, Bremen, Germany

¹⁶ Health Sciences, University of Bremen, Bremen, Germany

¹⁷ Center for Global Health Equity, New York University, Shanghai, Shanghai, China

¹⁸ Center for Macau Studies and Department of Communication, University of Macau, Macau (SAR), China

¹⁹ Department of Marketing, School of Business and Economics, Vrije Universiteit Amsterdam, Amsterdam, The Netherlands

²⁰ Department of Psychiatry, Universidad Autónoma de Madrid (UAM), Madrid, Spain

²¹ Centro de Investigación Biomédica en Red de Salud Mental (CIBERSAM), Instituto de Salud Carlos III, Madrid, Spain

²² Instituto de Investigación Sanitaria del Hospital Universitario La Princesa (IIS-Princesa), Madrid, Spain

²³ Department of Clinical Neuroscience, Division of Insurance Medicine, Karolinska Institutet, Stockholm, Sweden

²⁴ Department of Consultation-Liaison Psychiatry and Psychosomatic Medicine, University Hospital of Zurich, University of Zurich, Zurich, Switzerland

²⁵ Institute of Health and Society (IRSS), Université Catholique de Louvain (UCLouvain), Brussels, Belgium

²⁶ Department of Anthropology and Jackson School of Global Affairs, Yale University, New Haven, USA

²⁷ Department of Global Health and Social Medicine, Harvard Medical School, Boston, MA, USA

²⁸ Department of Basic, Clinical Psychology and Psychobiology, Universitat Jaume I, Castellón, Spain

²⁹ CIBER de Fisiopatología de La Obesidad y Nutrición (CIBEROBN), Carlos III Institute of Health, Madrid, Spain

³⁰ South African Medical Research Council Unit on the Genomics of Brain Disorders, Department of Psychiatry, Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, South Africa

³¹ Department of Epidemiology and Public Health, Sciensano, Brussels, Belgium

³² Department of Psychiatry and Psychotherapy, Charité–Universitätsmedizin, Freie Universität Berlin, Humboldt-Universität Zu Berlin, and Berlin Institute of Health, Berlin, Germany

³³ Bristol Medical School, Department of Population Health Sciences, University of Bristol, Bristol, UK

³⁴ School of Psychology, UNSW, Sydney, Australia