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Research paper

Depressive symptoms among adults in 2018–2019 and during the 2020 COVID-19 pandemic in Italy

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ABSTRACT

Background: Restrictions due to Coronavirus disease 2019 (COVID-19) has produced a large number of effects on mental health, which are expected to endure over time. In this study, we assessed depressive symptom levels before the COVID-19 pandemic, from January 2018 to December 2019, and during the pandemic in Italy in 2020.

Methods: We used the Patient Health Questionnaire-2 (PHQ-2), which is a screening instrument devised to detect probable depression and which has been annually administered in the framework of the Italian Behavioural Risk Factor Surveillance System since 2008. Depressive symptoms were assessed in a sample of 41,362 18–64-year-old adults surveyed in 2018–2019 and in a sample of 14,612 adults surveyed in 2020.

Results: The prevalence of depressive symptoms increased from 6.1% (95% CI 5.8%–6.4%) in 2018–2019 to 7.1% (95% CI 5.6%–8.6%) in March–April 2020. It then declined in May–June to 4.4% (95% CI 3.2%–5.5%) but in July–August it once again increased to 8.2% (95% CI 6.0%–10.4%) and, finally, gradually returned above the pre-lockdown level by November–December 2020 (5.9%; 95% CI 4.7%–7.1%). Compared to before the health crisis, during the pandemic, women and individuals with financial difficulties were found to have a significantly higher risk of depressive symptoms while younger, individuals with a higher education and those living in South Italy became increasingly vulnerable.

Conclusions: While the average response to the pandemic was one of resilience over time, women and younger individuals were found to be particularly prone to the risk of depressive symptoms, as a result of the pandemic. In future investigations, the risk of individuals living in the South of Italy should also be taken into consideration.

1. Introduction

Italy, one of the first countries to be heavily hit by the spread of the new Coronavirus SARS-CoV-2, promptly introduced strict national measures to restrain the outbreak and the Government introduced a nationwide lockdown on March 9th, 2020. Citizens were required to stay at home, and all major offices, malls, factories and schools were shut down for 69 days (until May 18th, 2020). As a consequence of the pandemic lockdown and the subsequent 2021 vaccination campaign, disease incidence has been decreasing throughout the Country, although there has been a recent new rise in the number of cases (Ministero della Salute, 2021b).

Following the onset of the pandemic, there have been a very large number of studies that have focused on the consequences of the lockdowns regarding the mental health of people, worldwide. In Italy, relatively high rates of depression, anxiety or psychological distress have been observed since the start of the COVID-19 lockdown (Fiorillo et al., 2020; Mazza et al., 2020; Amerio et al., 2021), similarly to several other countries (Xiong et al., 2020). Almost all the studies conducted worldwide to assess the impact of COVID-19 on mental health reported that symptoms of anxiety or depression or psychological distress have increased substantially since the onset of the COVID-19 restriction measures put in place from March through to April or May of 2020 (Xiong et al., 2020). However, the majority of these studies limited their data collection only to the months of the lockdowns, meaning there have been few studies that have compared mental health in the years preceding the pandemic vs. the COVID-19 pandemic period (Thombs et al., 2020). Moreover, these studies mostly used convenience samples which might lead to sampling bias (Pierce et al., 2020). Therefore, currently, it has yet to be definitively clarified whether levels of mental health

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throughout the pandemic actually worsened compared to pre-pandemic levels and whether mental health trajectory evolved after the lifting of the national lockdowns. Another crucial question which remains unclear regards whether or not some groups of people were found to be at increased risk of worsening mental health in the initial phase of the pandemic (i.e., women and younger individuals) (Xiong et al., 2020) have recovered or have become increasingly more vulnerable after that period.

In the present study, making use of data from the Italian Behavioural Risk Factor Surveillance System, called PASSI (Progressi delle Aziende Sanitarie per la Salute in Italia) (Baldissera et al., 2011), we examined large nationally representative probability-based samples of individuals from the general adult population residing in Italy in order to compare depressive symptom levels occurring before the pandemic, from January 2018 to December 2019, with those occurring in the period following the onset of the pandemic, in 2020. We considered the overall results and then we stratified the data according to demographic and socio-economic characteristics and medical conditions of the surveyed individuals.

2. Methods

2.1. Study design, data source and samples

We used data from the Behavioural Risk Factor Surveillance System PASSI, a joint state and regional survey which has been used to collect high-quality information regarding the health of the adult population since January 2008 throughout Italy. The PASSI survey is an on-going multistage design survey (or repeated cross-sectional survey) involving continuous data collection for about 35,000 people each year. The unit of data collection in PASSI is the Local Health Unit (LHU). Each of the 20 Italian regions comprises between 1 and 22 LHUs, which provide preventive and curative universal health care services for populations ranging from 40,000 to over 1 million. The target population consists of all people aged 18 to 69 years residing in the area. The eligible population comprises respondents who have a telephone number available and who are capable of being interviewed. In each LHU, a random sample is drawn monthly from the LHU’s enrolment list of residents. The list is then stratified according to sex and age (18–34; 35–49; 50–64); gender, educational attainment (low: none or elementary school or middle school; high: high school or university), employment status (unemployed, which also includes students and homemakers; temporarily employed; stably employed), economic difficulties (many or some; no difficulties in managing monthly income), presence of at least one chronic disease (defined as having ever received from a physician a diagnosis of a condition such as diabetes, renal insufficiency, asthma, chronic respiratory disease, chronic liver disease, cancer, coronary heart disease or other cardiovascular diseases, or cerebral stroke or brain ischemia); area of residence (North; Centre; South of Italy).

2.2. Outcome and covariate variables

The variable of interest regarded the presence of depressive symptoms in the last 14 days, which is routinely surveyed by the depression module used in the PASSI questionnaire (Gigantesco et al., 2015). It consists of the Patient Health Questionnaire 2 (PHQ-2) (Kroenke et al., 2003). In settings such as primary care or some inpatient and outpatients specialty care, the PHQ-2 has been widely validated and found to be at least 62% sensitive and 92% specific for cut-off scores of 3 or greater, in studies that used fully structured interviews as reference standards (Levis et al., 2020). Regarding semi-structured interviews, PHQ-2 sensitivity and specificity were 0.72 and 0.85 for cut-off scores of 3 or greater (Levis et al., 2020). For the purposes of the surveillance, PASSI chose the format and response categories adapted by the original developers for the United States’ Behavioural Risk Factor Surveillance System (Centers for Disease Control and Prevention, 2010). In this adaptation, the first question concerns how many days in the past 2 weeks the person has experienced little interest or pleasure in doing things, and the second refers to the number of days in which he or she felt down, depressed, or without hope. In both cases, the response ranges between 0 and 14 (Kroenke et al., 2009). The number of days is recorded on a point scale between 0 and 3 for each of the 2 questions: 0 to 1 day is coded as 0, 2 to 6 days as 1, 7 to 11 days as 2, and 12 to 14 days as 3; the points are then summed. Those with a summed score of 3 or more are considered to have depressive symptoms (case definition). This value corresponds to that demonstrated to be optimal for major depression screening purposes (Kroenke et al., 2003).

The socio-demographic characteristics and medical conditions included in the analyses as covariate variables were age (18–34; 35–49; 50–64); gender, educational attainment (low: none or elementary school or middle school; high: high school or university), employment status (unemployed, which also includes students and homemakers; temporarily employed; stably employed), economic difficulties (many or some; no difficulties in managing monthly income), presence of at least one chronic disease (defined as having ever received from a physician a diagnosis of a condition such as diabetes, renal insufficiency, asthma, chronic respiratory disease, chronic liver disease, cancer, coronary heart disease or other cardiovascular diseases, or cerebral stroke or brain ischemia); area of residence (North; Centre; South of Italy).

2.3. Statistical analysis

First of all, we conducted a time-series analysis of depressive symptom prevalence from January 2008 to December 2019 in order to verify the presence of seasonality. A graphical technique can be used to detect seasonality, decomposing the time-series into three parts (trend, seasonal and random components) and evaluating their autocorrelation plot. If there is significant annual seasonality, the autocorrelation plot should show spikes at seasonal lag equal to 12. Seasonality in time series can also be identified from the time plot of the entire series by regularly spaced peaks and troughs which have a consistent direction and approximately the same magnitude every period/year, relative to the trend.

In absence of variations among years and different months within the years, we could have used a pre-pandemic 2018–2019 pooled prevalence as baseline.

Secondly, we calculated the prevalence of depressive symptoms, overall and according to socio-demographic, economic and medical conditions, that occurred in 2018–2019, in 2020 and in January–February, March–April, May–June, July–August, September–October and November–December 2020, to evaluate changes in depressive symptoms during 2020 using multiple time-points after the onset of the COVID-19 pandemic.

A regression analysis was performed for every single group at risk (as identified by socio-demographic, or economic or medical condition variables) to investigate in which bimonthly period of 2020 each group was particularly prone to an increased risk of depressive symptoms.

Two regression analyses were then performed including all the groups at risk together. The first was carried out to examine which groups were affected by an increased risk of depressive symptoms in the
were maintained or worsened during the pandemic or whether some new risk factors emerged.

In addition, a regression analysis was conducted to evaluate whether some groups at risk tended to deteriorate or recover at the end of 2020 (i.e., November–December 2020).

Descriptive and regression analyses were applied to take into account the complex sampling design in PASSI using Statas (version 16.0) survey commands. Prevalence estimates were weighted, assigning each observation with a probability weight equal to the inverse of the sampling fraction in each LHU stratum to produce nationally representative estimates. Prevalence rate ratios (PRRs) were calculated using the Poisson regression with robust variance and hypothesis testing (Barros and Hirakata, 2003). Time-series were carried out in RStudio software (version 1.4.1717) of the open-source software R.

3. Results

3.1. Seasonal or year-to-year variations in the prevalence of depressive symptoms across 2008–2019

The time-series analysis of monthly depressive symptom prevalence, based on 430,011 interviews, showed a contained but significant downward trend from 7.4% in January 2008 to 5.8% in December 2019. Furthermore, the analysis showed that the prevalence of depressive symptoms was affected by monthly seasonality with a recurrent 12 period lag. Generally, the highest value is registered in June and the lowest one in August, but the entity of these variations was minimal (Supplementary material: Figs. S1-S2).

3.2. Prevalence of depressive symptoms across 2018–2020

A total of 41,362 individuals aged 18–64 years participated in 2018–2019 and a total of 14,612 individuals participated in the 2020 survey. The overall response rates in 2018, 2019 and 2020 were 79.5%, 79.2% and 81.6%, respectively.

No significant differences were registered across the years 2018–2020 as regards age, gender and chronic illness of the participants, whereas differences were registered regarding levels of education, area of residence, economic difficulties and employment status of the respondents (Table 1).

The overall prevalence of depressive symptoms in 2018–2019 was 6.1% (95% CI 5.8%–6.4%). In 2020, this prevalence increased to 7.1% (95% CI 5.6%–8.6%) in March–April 2020, during the national lockdown. It then declined to 4.4% (95% CI 3.2%–5.5%) in May–June, after the lifting of the lockdown, but in July–August, it once again increased to 8.2% (95% CI 6.0%–10.4%) and, finally, gradually returned (September–October: 7.5%; [95% CI 5.8%–9.1%]) above the pre-lockdown level in November–December 2020 (5.9%; [95% CI 4.7%–7.1%]). Given that the confidence intervals overlapped, no overall differences were found between the prevalence observed in all these temporal intervals and the baseline 2018–2019 prevalence (Supplementary material: Table S3).

3.3. Adjusted risks of depressive symptoms in each single group in 2020

In contrast, compared to pre-pandemic levels, significant increased risks were observed among women in July–August 2020 (PRR: 1.50; 95% CI 1.09–2.07) and in September–October 2020 (PRR: 1.40; 95% CI 1.02–1.94). Table 1 presents the prevalence of depressive symptoms in the different socio-demographic characteristics of the sample. Significant adjusted risks were observed in women, female age group, educational level, employment status and economic difficulties.

Table 1

| Characteristics                  | 2018 (n = 20,437) | 2019 (n = 20,925) | 2020 (n = 14,612) | p-Value  |
|----------------------------------|-------------------|-------------------|-------------------|----------|
|                                  | % (IC 95%)        | % (IC 95%)        | % (IC 95%)        |          |
| Gender                           |                   |                   |                   |          |
| Male                             | 49.5 (49.0–50.0)  | 49.6 (49.1–50.1)  | 49.8 (48.9–50.6)  | 0.8503   |
| Female                           | 50.5 (50.0–51.0)  | 50.4 (49.9–50.9)  | 50.2 (49.4–51.1)  |          |
| Age group                        |                   |                   |                   |          |
| 18–34y                           | 29.9 (29.4–30.5)  | 29.8 (29.3–30.2)  | 29.5 (28.8–30.3)  | 0.0366   |
| 35–49y                           | 35.5 (35.0–35.9)  | 34.9 (34.4–35.4)  | 34.3 (33.5–35.1)  |          |
| 50–64y                           | 34.7 (34.2–35.1)  | 35.3 (34.8–35.9)  | 36.2 (35.4–37.0)  |          |
| Education level                  |                   |                   |                   |          |
| High (high school or university) | 68.0 (67.2–68.7)  | 68.9 (68.1–69.7)  | 73.1 (72.1–74.0)  | <0.001   |
| Low (middle school, primary school or none) | 32.0 (31.3–32.8) | 31.1 (30.3–31.9) | 26.69 (26.0–27.9) |          |
| Economic difficulties            |                   |                   |                   |          |
| No (none)                        | 46.9 (46.1–47.7)  | 49.7 (48.8–50.5)  | 55.2 (54.1–56.3)  | <0.001   |
| Yes (some/many)                  | 53.1 (52.3–53.9)  | 50.3 (49.5–51.2)  | 44.8 (43.7–45.9)  |          |
| Geographic area of residence     |                   |                   |                   |          |
| North                            | 30.0 (29.6–30.5)  | 30.3 (29.8–30.7)  | 28.3 (27.5–29.0)  | <0.001   |
| Centre                           | 21.2 (20.8–21.6)  | 20.6 (20.2–21.1)  | 22.7 (22.0–23.3)  |          |
| South                            | 48.8 (48.3–49.2)  | 49.1 (48.5–49.6)  | 49.1 (48.2–49.9)  |          |
| At least one chronic disease     |                   |                   |                   |          |
| Yes                              | 16.4 (15.8–17.0)  | 16.8 (16.1–17.5)  | 15.9 (15.1–16.7)  | 0.1800   |
| No                               | 83.6 (83.0–84.2)  | 83.2 (82.5–83.9)  | 84.1 (83.3–84.9)  |          |
| Employment status                |                   |                   |                   |          |
| Continuously employed            | 51.0 (50.2–51.9)  | 52.7 (51.8–52.6)  | 49.7 (48.6–50.9)  | <0.001   |
| Temporarily employed             | 13.6 (13.0–14.1)  | 12.2 (11.6–12.8)  | 15.2 (14.5–16.0)  |          |
| Unemployed                       | 35.4 (34.6–36.2)  | 35.1 (34.3–35.9)  | 35.0 (33.9–36.1)  |          |
3.4. Adjusted risks of depressive symptoms in 2018–19 and in 2020

Before the pandemic, depressive symptoms were associated with having chronic diseases (PRR: 2.35; 95% CI 2.10–2.62), having economic difficulties (PRR: 1.92; 95% CI 1.72–2.15), being unemployed (PRR: 1.48; 95% CI 1.31–1.67), female gender (PRR: 1.37; 95% CI 1.22–1.53) and being aged 50–64 years (PRR: 1.20; 95% CI 1.04–1.39).

Significant protective factors included having higher educational levels (PRR: 0.87; 95% CI 0.78–0.97), and living in Central (PRR: 0.75; 95% CI 0.67–0.84) or South Italy (PRR: 0.58; 95% CI 0.51–0.66) (Table 2).

In 2020, during the pandemic, depressive symptoms were associated with having chronic diseases (PRR: 1.74; 95% CI 1.40–2.15), having economic difficulties (PRR: 2.00; 95% CI 1.61–2.47), being unemployed (PRR: 1.35; 95% CI 1.06–1.72) and female gender (PRR: 1.55; 95% CI 1.26–1.91). Significant protective factors included living in Central (PRR: 0.64; 95% CI 0.52–0.80) or, although to a lesser extent compared to before the pandemic, in South Italy (PRR: 0.67; 95% CI 0.53–0.84) (Table 2).

Compared to before the pandemic, during the pandemic, the risk associated with having chronic diseases and being unemployed slightly decreased, while the risk linked to being women or having economic difficulties increased. Being of an older age ceased to be a risk factor, while high education levels ceased to be a protective factor.

In November–December 2020, depressive symptoms were associated with having chronic diseases (PRR: 2.51; 95% CI 1.59–3.96), having economic difficulties (PRR: 1.75; 95% CI 1.08–2.82) and female gender (PRR: 1.88; 95% CI 1.21–2.92). Significant protective factors included being aged 35–49 years (PRR: 0.40; 95% CI 0.22–0.73) or 50–64 years (PRR: 0.55; 95% CI 0.33–0.93) and living in Central Italy (PRR: 0.50; 95% CI 0.30–0.83) (Table 2).

Therefore, compared to before the pandemic, at the end of the 2020, the increased risk associated to being women accentuated. Having economic difficulties or chronic diseases persisted as risk factors. Being 35–64 years of age became a protective factor, while high educational levels, being continuously or temporarily employed and living in the South of Italy were no longer protective factors.

4. Discussion

To the best of our knowledge, this is the first study to track temporal changes in depressive symptoms from before the pandemic throughout the course of the COVID-19 pandemic in nationally representative samples of Italian adults, and, it is one of the few studies that have documented changes throughout a longer period from the inception of the pandemic in order to identify the medium-term (Pierce et al., 2021; Fancourt et al., 2021; Daly et al., 2020; Daly and Robinson, 2021; Varga et al., 2021) rather than immediate effects of the pandemic on mental health (Planchuelo-Gómez et al., 2020; Pierce et al., 2020; Daly et al., 2020; Sibley et al., 2020; McGinty et al., 2020; van der Velden et al., 2021).

The present study shows that overall, in Italy, during the pandemic, depressive symptoms increased in March–April 2020, during the lockdown, but not significantly compared to 2018–2019. Then, they decreased in May–June, immediately after the lifting of the lockdown, but subsequently, in July–August, once again increased, and finally recovered to above the pre-lockdown level by November–December 2020.

This overall response is consistent with reports of the UK Household Longitudinal Study (Pierce et al., 2021) which evidenced an initial rise in psychological distress, immediately after the introduction of the lockdown, followed by a gradual return by October 2020 to around 2018–2019 levels, and suggests that although poor mental health rose in the initial stages of the pandemic, subsequently it recovered, at least on average. Other longitudinal studies have also shown that the general state of poor mental health was high during the early phase of the pandemic, from March to April or early May 2020, (Planchuelo-Gómez et al., 2020; Sibley et al., 2020; Daly et al., 2020; Kikuchi et al., 2020; Daly and Robinson, 2021; Pierce et al., 2021; van der Velden et al., 2021; Fancourt et al., 2021; Varga et al., 2021), but it then tended to decrease gradually throughout the subsequent months (Daly et al., 2020; Varga et al., 2021) or even disappear by June or July (Fancourt et al., 2021; Daly and Robinson, 2021; van der Velden et al., 2021).

Therefore, the overall mental health trajectory that we observed is consistent with a recovery average response to the stress of the pandemic observed across other nations and countries, although compared to these nations, our findings evidenced a delayed response with a peak occurring in July–August instead of March–April 2020. On the other hand, however, similarly to our findings, recently the Household Pulse Survey conducted by the US Census Bureau reported that between April and December 2020, the levels of depressive symptoms fluctuated with two peaks in July and November (Zhang et al., 2021).

In Italy, to date, the prevalence of mental health disturbances during the pandemic has been reported in only a few cross-sectional community-based studies (Amerio et al., 2021; Fiorillo et al., 2020; Mazza et al., 2020), and, more recently, in a unique longitudinal study which evaluated depressive symptoms immediately before (February 2020) and after the lockdown (June 2020) (Medda et al., 2021). Despite the fact the
comparison of the present study with those studies is limited by differences in sampling methods and in the measurement tools and thresholds used, our findings appear to be in contrast with the majority of them, given that they showed that symptoms of distress or depression increased substantially during the lockdown, and up to 132% (Amerio et al., 2021), while our findings showed that an increase in that period, although present, was not significant compared to the pre-pandemic level. However, those studies only evaluated the occurrence of symptoms during the lockdown or immediately before and immediately after, without a comparison with the prevalence of symptoms taken from the years preceding the pandemic. Therefore, they could not provide definite information regarding of a mental health worsening as well as of the mental health trajectory after the initial shock due to the pandemic. Besides, in one of those studies, depressive symptoms were assessed after the inception of the lockdown, by asking participants to refer to both before and during the lockdown, which entails the risk of recall bias (Amerio et al., 2021).

While our findings highlighted that, overall, the increase of depressive symptoms observed during the pandemic was small in size and as such of limited meaningfulness from a clinical point of view, at the same time, it evidenced more marked increases in some population groups (and no increases in some others). Overall, these findings are consistent with most studies from the USA and across Europe, which reported a small to moderate detrimental effect on mental health during the early phases of the pandemic but, at the same time, a more severe worsening of mental health in particular population groups (Fancourt et al., 2021; Daly and Robinson, 2021; Planchuelo-Gómez et al., 2020; Sibley et al., 2020; Daly et al., 2020; Medda et al., 2021).

Among these population groups, our findings definitively showed that in Italy, a significant increased risk of depressive symptoms occurred during the second semester of 2020, in parallel with the second wave of infections which started in August 2020 (with a peak on the 12th of November 2020) (Ferrante, 2021). Additional analyses regarding more than 430,000 depressive symptom assessments conducted by the PASSI surveillance suggested that this risk was extremely unlikely under the normal circumstances of seasonal or year-to-year variations, which were found to be minimal over the course of more than a decade (2008–2019) and, generally, with the lowest value in August.

It should be noted that given that the prevalence of depressive symptoms in 2020 was found to change with time, that prevalence could be partly related to the number of infections registered at national level in the different 2020 periods. In other words, the trend of depressive symptoms might be in line with the curve describing the evolution of the rates of positive tests for COVID-19 in 2020. In Italy, the curve of incident infections showed 6,664,655 cases from the beginning of the pandemic to the 7-th of February 2021. The first pandemic wave had its peak of 26,575 new infections on the 14-th of March 2020 and ended within the last two weeks of July. The second wave started to grow in August and increased faster from the last week of September onwards. It presented its peak of 60,425 infections on the 12-th of November, was stable at about 41,500 between the 17-th and the 29-th of December, and finally decreased to 26,288 on the 7-th of February 2021 (Ferrante, 2021). This suggests that the prevalence trend of depressive symptoms may have been affected, at least on average, by the spread evolution of the pandemic.

The occurrence of this increase some months after the beginning of the pandemic suggests that as Italy progressed through the pandemic and as its economic and social consequences of lockdown increased, simultaneously an increased risk of depressive symptoms emerged in some population groups. Among women, for example, that risk moved from a pre-pandemic risk of 1.37 to a risk of 1.55 in 2020 (with a peak of 1.88 in November–December 2020), which resulted in an even greater gender difference than before the pandemic. The association between depressive symptoms and female gender was observed in the initial phase of the pandemic in both previous cross-sectional (Ahmed et al., 2020; Gao et al., 2020; González-Sanguino et al., 2020; Wang et al., 2020a) and longitudinal studies (Daly et al., 2020; Daly and Robinson, 2021; Fancourt et al., 2021; Planchuelo-Gómez et al., 2020; Medda et al., 2021) and may be mostly explained by the known underlying vulnerability of women to common mental health disorders (Weinberger et al., 2018) but also by other factors such as additional carer and household responsibilities due to school closures (Burki, 2020) or the illness of family members, which are more likely to affect women (COVID-19 Mental Disorders Collaborators, 2021).

An increased risk of having depressive symptoms was also observed among individuals with financial difficulties, who, like women, were already at risk of depressive symptoms before the pandemic. The association between poor economic status and risk of having symptoms of mental disorders, especially depressive symptoms align with previous research during the initial phase of the pandemic (Fancourt et al., 2021; McGinty et al., 2020; Gao et al., 2020; Lei et al., 2020; Wang et al., 2020b; Medda et al., 2021).

On the basis of these findings, one may speculate that some pre-existing inequalities have been exacerbated throughout the pandemic in our country. Some previous research has found that pre-existing inequalities in mental health were maintained, but they had not increased during the initial stage of the pandemic, although that research acknowledged that those inequalities would likely have widened if the analysis had been carried out some further months after the lockdown period (Pierce et al., 2020).

In the present study, we observed that differences in depressive symptoms among different age groups diminished during the pandemic given that younger people tended to have a deteriorating mental health trajectory. The finding that the younger age classes tended, compared to before the pandemic, not to be protected against depressive symptoms is consistent with many studies on the psychological impact of Covid-19 pandemic (COVID-19 Mental Disorders Collaborators, 2021; Zhang et al., 2021; Daly et al., 2020; Planchuelo-Gómez et al., 2020; Pierce et al., 2020; McGinty et al., 2020; Daly et al., 2021; Varga et al., 2021; Medda et al., 2021) and suggests that it is urgent to pay great attention to young people in order to prevent the risk of serious mental health consequences in the lead-up, for example, to potential future lockdowns. In Italy, as well as in other countries, the Covid-19 emergency may have magnified pre-existing economic inequalities among younger adults who even before the Covid-19 emergency were more likely to be unemployed or still students. However, rather than due to their working conditions, young people may have been affected by stressors such as reductions in social peer interactions (Medda et al., 2021; Guerin et al., 2021) and transitions into online learning if still in school. In fact, as regards working conditions, although the risk of symptoms during the pandemic remained higher in people who were unemployed or in other economically inactive roles, such as being a full-time student, the increase in depressive symptoms was greater among those who were employed, thereby reducing the difference between unemployed and employed individuals. Some in the group of employed individuals may have feared losing their job, or have been forced to work in ways that exposed them to COVID-19 infection.

In our opinion, this is consistent with the finding that worsening of mental health, although not significant, was also observed in individuals with higher education levels, who ceased to be a protected group during the pandemic. This is in line with some previous studies which showed that individuals with higher education had more depressive symptoms in comparison with less educated individuals (Daly et al., 2020; Moghadamnia, 2020; Wang et al., 2020a). It is likely that the pandemic continued and a state of socio-economic crisis persisted, other brackets of the population have also been affected by decreases in household income or job instability or various other disadvantages.

Also, the protection provided by living in South Italy attenuated during the pandemic, and, in November–December 2020, living in South Italy was no longer found to be protective compared to before the pandemic. This is consistent with the results of the only longitudinal study conducted in our country (Medda et al., 2021). In the southern...
regions, gross domestic product per capita and health-care spending per capita are lower than in northern regions, but this condition did not negatively affect depressive symptoms until the pandemic. Geographical inequalities in the hospital system (e.g., the southern hospitals have less technologically advanced equipment per inhabitant than northern hospitals) and in quality and access to care (Ricciardi and Tarricone, 2021) may have caused concern or fear among citizens of Southern regions that health services could not guarantee them any specific standard of care against CoVID-19.

Finally, there was no evidence to suggest that individuals with chronic illnesses were at increased risk of mental health problems during the pandemic compared to before the pandemic, although the risk of depressive symptoms remained high in this group during the pandemic and was even higher in November–December 2021. It is possible that due to previous experience of illnesses, those individuals had already learnt to apply coping strategies in stressful situations, but only in the early phase of the pandemic.

4.1. Limitations and strengths

This study has some potential limitations. First, the data are cross sectional, which prevents us from making causal inferences. Moreover, whilst the PHQ-2 is a reliable and well-validated screening instrument for detecting probable depression, it does not provide a clinical diagnosis of depression. Diagnostic instruments or longer scales could confirm the robustness of the trend observed. To mitigate, at least partially, this limitation, it should be noted, however, that a recent individual participant data meta-analysis of 44 studies involving 10,627 participants reported only small differences in sensitivity and specificity between the PHQ-2 and the longer PHQ-9 (Levis et al., 2020), which suggests that the psychometric performance of the PHQ-2 is only marginally lower than that of the full PHQ-9.

Another limitation regards the participation rate of LHUs in 2020 (64%), which was lower than normal in the PASSI and has resulted in wider confidence intervals of estimates in 2020. This was due to the different challenges which were encountered during the pandemic by the healthcare professionals who administered telephone interviews. The majority of those professionals partially or completely changed their routine duties in order to test and provide treatment for people with presumed or diagnosed COVID-19. However, the validity of the trend estimates was assured, given that in the analyses, we included only the LHUs which participated to all the surveys across the years 2018–2020.

Moreover, we found some differences in socio-demographic characteristics of participants across the years. In 2020, the sample comprised individuals who were more educated, with less economic difficulties, more temporarily employed and living in the North of Italy than the individuals surveyed in 2018 and 2019. While these differences reflected some changes in general population characteristics over time (overall, there were progressive reductions in working class and undereducated populations and gains in incomes) we cannot exclude that there may be some residual selection bias.

Finally, the PASSI assesses individuals who are capable of being interviewed meaning that some of those in at-risk settings such as prisons, or in-patient facilities were not interviewed.

Despite these limitations, this study has a number of strengths. The findings could be considered as a general representation of the adult educated populations and gains in incomes) we cannot exclude that some of those in at-risk settings such as prisons, or in-patient facilities were not interviewed.

5. Conclusions

While a recovery in depressive symptoms was the average response in this study, the inequality according to gender was accentuated throughout the aftermath of the Covid-19 lockdown and some groups including younger individuals, individuals living in the South of Italy and individuals with higher education levels, for the first time became vulnerable. Known emotionally vulnerable groups, such as individuals with chronic diseases or unemployed individuals or individuals with economic difficulties, have remained at risk throughout lockdown and its aftermath. However, in a later stage of the COVID-19 crisis, at the end of 2020, we observed that in unemployed individuals and in individuals with economic difficulties, the risk reduced, which was possibly due to the protective measures taken in autumn by the Government in order to safeguard jobs and finances. In contrast, in November–December 2020, women, younger adults and individuals living in the South of Italy appeared not to recover and even have a worsening in symptoms. It will be important to update our analyses to verify whether this worsening remained stable or recovered over the course of 2021.

Despite the fact certain groups partially recovered by the end of 2020, it is important to remember that they showed vulnerability to the stressors due to the pandemic. Therefore, it cannot be ruled out that these groups of the population will again show increased risk if they experience these stressors a second time, due to potential future lockdowns or cessation of government protective measures taken during the early phases of the pandemic to safeguard vulnerable groups. In advance of potential restrictive measures to contain the epidemic or proposals to withdraw special social security measures, our findings emphasise the importance of supporting individuals who experienced a worsening of mental health for the first time (such as younger people and individuals living in the South of Italy) or had a progressive exacerbation of the risk by the end of 2020 (i.e., women), with tailored psychosocial interventions in order to prevent the risk of serious mental health consequences.

Everywhere that population mental health had been measured in 2020, it had declined (OECD, 2021a). This fact has been especially true for women and young people. Women across the world have been disproportionately affected by the COVID-19 pandemic. Italy, which held the 202 G20 Presidency, has seen an alarming job loss for women – in December 2020 alone 98% of lost jobs were occupied by women (ISTAT, 2020). In some countries, prevalence of depression and anxiety doubled among young people with the worst affected young people being those experiencing unemployment and financial difficulties (OECD, 2021b).

On these premises, the G20 Presidency called all the relevant actors in all countries to support and implement planned interventions which should reach vulnerable populations such as women, children, youth and elderly people with a particular attention paid to the gendered implications of mental health problems. A special effort is needed to increase the capacity of and improve access to mental health services, especially maternal, child and youth community mental health services, considering the key recommendations for the G20 countries to strengthen those services as a crucial element of recovery, as outlined in the Policy Paper released at the Mental Health Side Event organised by the Italian Presidency. In agreement with those recommendations, the WHO Comprehensive Mental Health Action Plan 2013–2030, recently endorsed at the 74th World Health Assembly, affirmed that there is a need to promote access to mental health services and psychosocial supports as part of pandemic and economic recovery efforts (WHO, 2021).

Further, the G20 Presidency recommended an integrated cross-sectoral response – including health, education, research, welfare, housing and labour market policies – engaging a wide range of points of prevalence after the onset of the COVID-19 pandemic in Italy, unlike many other mental health surveys during the pandemic.
stakeholders within and beyond health, in order to truly be effective in addressing the global burden of mental disorders and to promote mental health (G20, 2021).

CRediT authorship contribution statement

Antonella Gigantesco: Conceptualization, Methodology, Investigation, Writing - original draft.
Valentina Minardi: Conceptualization, Methodology, Investigation, Formal analysis.
Benedetta Contolli: Conceptualization, Methodology, Resources.
Maria Masocco: Conceptualization, Methodology, Investigation, Supervision.

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Ethics approval

The Ethics Committee of the Italian National Institute of Health (Istituto Superiore di Sanità) has issued a favourable ethical opinion on the PASSI surveillance. The protocol number of the final opinion is CEISS 06/158 - 8th of March 2007.

In PASSI, verbal informed consent was obtained from all participants included in the study at the beginning of the telephone interview. This is an essential condition for the interview to be continued. The ethics committee approved the procedure.

Conflict of interest

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

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jad.2022.04.131.

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