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**One wave or another in the pandemic:
Psychological well-being during the third COVID-19 wave**

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Abstract

Background

After a year from the emergence of COVID-19 on February 2020, between March and May 2021 Italy faced its third wave of infections. Previous studies have shown that in the first phases of the pandemic certain factors had a protective role against distress, however, little is known regarding the role of possible protective variables after prolonged pandemic situations. Participants and procedure 454 Italian adults were asked questions regarding the intensity of mental states and emotions experienced, the perceived usefulness of lockdown, the feeling of living a normal life, and the coping strategies implemented to face the pandemic.

Results

Our findings indicate that the presence of acceptance attitudes toward restrictive measures and the implementation of recreational activities helped participants face a prolonged pandemic with positive emotions.

Conclusions

These results extend previous findings about the impact of several behavioral variables on individuals' mental states and emotions experienced during COVID-19 in Italy.

Introduction

On December 1st, 2019, the first diagnosis of COVID-19 infection in China was provided (Huang et al., 2020). Within a few months, several cases emerged across the world, making the COVID-19 outbreak a pandemic disease. After the first wave of COVID-19 infections, which affected a large number of countries approximately between March 2020 and June 2020, other COVID-19 waves have been reported. This period deeply affected people's psychological well-being interfering with their daily functioning (Groarke et al., 2020).

To date, Italy faced three waves of COVID-19: the first one between March and June 2020, the second one between October and December 2020 and finally the third one between March and May 2021. During the first wave, a full and nation-wide lockdown was applied from March to May 2020, then the measures were lifted around June 2020, and then, from November 2020, selected restrictions were applied classifying the Italian regions in color-zones depending on the severity of the outbreak (from white, with low rates of infection and severe cases, to red, with very high rates). No studies so far have been conducted with the aim of investigating the factors that can help maintain positive emotions during prolonged lockdown measures due to repeated waves of the pandemic.

Given the relevance of this period for the entire humanity, scientific research extensively studied the physical and psychological reactions to what people have been experiencing. Overall, one of the most studied topics in this pandemic is “fear of COVID-19”, an emotion due to its rapid spread and high mortality rate (e.g., Dymecka, Gerymski, & Machnik-Czerwik, 2021). It has been shown by Dymecka and colleagues (2021) that fear of COVID-19 and perceived stress were negatively related to life satisfaction and, in agreement with previous studies (Zhang et al., 2020), researchers concluded that stress negatively influences people's well-being.

Another interesting finding on COVID-19 fear concerns its link with physical activity. Wilczyńska and colleagues (2021) showed that people did physical activity to face the fear of COVID-19, to manage the stressful situation and escape the daily routine.

In addition to physical activity, general recreational activities are very important for coping with stress, providing opportunities to bring people together and implement socialization and communication. However, we need to notice that also other behavioral variables, such as thoughts and feelings experienced during this period, can be relevant as protective factors.

Several studies indeed showed that the development of coping strategies and the experience of positive emotions was facilitated by several protective factors such as social support, sport, sharing

thoughts and feelings about COVID-19 with others, as well as perceiving the usefulness of restrictive measures (Armor et al., 2020; Golemis et al., 2021; Marchetti et al., in press).

Previous studies indicated that the perceived usefulness of lockdown positively affected people's emotions, suggesting that a better communication by the government of the experimental findings supporting the political decisions made can enhance people's well-being. Similarly, the results suggested that also the behavioral measures devised by the government and tailored to the need to increase people's commitment to the proposed rules are crucial in increasing the well-being of the population (Marchetti et al., in press). However, such results were limited to the first wave. The first wave had different characteristics compared to subsequent waves occurring over time, as it was characterized by the novelty and surprise of the experience, the hope of a relatively rapid solution, and the desire to activate coping strategies (people were singing or playing from windows and balconies, for example). Subsequent waves, occurring after months, lack these characteristics, while triggering a greater sense of hopelessness, of helplessness and the inability to see an end to the pandemic (Johansson et al., 2021). Here, we aimed to investigate the third wave of the pandemic in Italy, occurring more than one year after the first. Specifically, we were interested in examining how, during the third wave, people's emotions and mental states were affected by behavioral variables such as the perceived usefulness of lockdown, the feeling of living a normal life, and various coping strategies implemented to face the pandemic. Indeed, as the days in the pandemic situation went by, people's feelings and experiences significantly changed (Johansson et al., 2021) and it is relevant to assess how people's well-being was affected during this period.

The predictors were tailored to measure three relevant spheres of people's life. A first predictor – the perceived usefulness of lockdown – was meant to measure people's opinion on the decision taken by the government in order to counter the spread of the virus; the second predictor – the feeling of living a normal life – was meant to measure people's internal perceptions regarding the period they were living in; while the third predictor – the coping strategies implemented to face the pandemic – was meant to measure external mechanisms and everyday actions that people put in place during those days.

The main goal of the present study was thus to extend to subsequent waves of the pandemic the research on the effect of COVID-19 of elements that might protect people's psychological health (i.e., mental states and emotions experienced during this period).

Participants and methods

Participants

Four hundred and fifty-four Italian adults volunteered to participate in the experiment (343 women and 111 men; age range = 19–77 years, $M = 41$, $SD = 16$, Median = 43, Mode = 60). One hundred and sixteen were under 25 years of age, 91 were between 26 and 35 years, 84 were between 36 and 50 years and 163 were over 51, Table 1 shows the distribution of the individuals by gender and age groups. Twenty nine percent of the sample were unemployed, twenty six percent were students, thirty five percent were full-time workers, two percent were lay-off workers, sixteen percent were freelance workers, and forty-two percent were retired (Table 2).

Informed consent was obtained from all participants before the experiment. The study was approved by the Department Ethics Committee of La Sapienza University of Rome (Prot. n. 0000292 del 01/04/2020 - [UOR: SI000092 - Classif. VII/15]).

Tab. 1. Distribution of participants by age group and gender

		Age				Total
		<25	26-35	36-50	>51	
Gender	Women	88	74	66	115	343
	Men	27	18	18	48	111
Total		115	92	84	163	454

Tab. 2. Distribution of participants by job

Total (N= 454)	
<i>Education, n (%)</i>	
Unemployed	29 (6,4)
Student	120 (26,4)
Full-time worker	159 (35,0)
Layoff worker	12 (2,6)
Freelancer	75 (16,5)
Retired	59 (13,0)

Materials and procedure

Participants were contacted and tested during the period of strong restrictions when many regions in Italy became “Red Zones” between March and April 2021. The survey was developed on Google Forms and the recruitment was conducted through social media. The invitation and link

for the study was sent via email, WhatsApp, Facebook, and other social media, throughout the entire nation.

After providing informed consent and demographic information, participants were asked to answer several questions regarding: i) the intensity of various mental states and emotions experienced, ii) the perceived usefulness of lockdown, iii) the feeling of living a normal life, and iv) the frequency of use of coping strategies implemented to face the pandemic.

In the first part of the questionnaire administered to the participants, which is based on the Brief Mood Introspection Scale (BMIS; Mayer & Gaschke, 2001) and the Brunel Mood Scale (BRUMS; Terry et al., 2003), the intensity of the mental states and the emotions experienced was investigated asking participants to rate the intensity of the following items: Active, Energetic, Resilient, Curious, Determined, Supportive, Compassionate, Anxious, Fearful, Vulnerable, Oppressed, Unaffectionate, Unsentimental, Indifferent, Hostile, Lonely. Each adjective represents the answer to a question such as “How do you feel now?”, “How have you been feeling in the past week, including today?”, or “How have you been feeling?”. The participant has to select the intensity of mood (through items/adjectives) selecting an option from a rating scale from 0 to 4 (0 = Not at all, 4 = Extremely). The first seven items were considered having a positive emotional valence, the others having negative emotional valence.

The other three parts of the questionnaire were aimed respectively at measuring people’s opinion on the decision taken by the government in order to counter the spread of the virus, people’s internal perceptions regarding the normality of their life, and external actions that they put in place during the third wave of COVID-19 in Italy.

The perceived usefulness of lockdown was measured asking participants the following questions: “Is staying at home useful for you?”, “Are you experiencing something new?”. The answers were on a 5-level Likert scale, they ranged from 0 to 4 (0 = Not at all, 4 = Extremely). Lockdown has led many individuals to explore new areas of interest, reassess their lives, their role in society, the importance of family members and friends. In this sense lockdown has also provided the opportunity for some novel experiences, which are investigated in the questions.

The feeling of living a normal life was investigated asking participants the following questions: “Can you stay focused?”, “Do you study/work easily?” “Is it easy to keep old social relationships?”, “Is it easy to develop new social relationships?”, “Do you feel deprived of your freedom?”. The answers were on a 5-level Likert scale, they ranged from 0 to 4 (0 = Not at all, 4 = Extremely).

Finally, the coping strategies implemented were investigated asking participants to indicate which of the following common coping strategies they put into practice to face the pandemic “talking with friends”, “playing on electronics”, “singing/playing instruments”, “doing physical activities/sports”, “reading”, “watching television/movies”, “cooking/baking”. The answers were on a 5-level Likert scale, they ranged from 0 to 4 (0 = Never, 4 = Always).

Results

All the analyses were performed using *R* (version 3.6.3; R Core Team, 2020). Data were analyzed through a mixed-effects approach, which incorporates both fixed-effects and random-effects (associated to participants and task stimuli) and allows for the specification of predictors at both participants and/or item level. Linear mixed models (LMMs) were estimated using the *lme4* *R* package (Bates et al., 2015).

Our main dependent variable was the intensity of the mental states and the emotions experienced by the participants. The three continuous predictors in our statistical model were i) perceived usefulness of lockdown, ii) feeling of living a normal life iii) coping strategies implemented to face the pandemic.

Firstly, we performed an exploratory factor analysis to investigate how the selected emotions aggregated. Extraction method was set as minimum residuals and rotation was set as oblimin, the number of factors was based on parallel analysis and the threshold for factor loadings was set as .40 (Stevens, 1992). Using these parameters we identified four factors, specifically:

- A negative-internal one, comprising: Anxious, Fearful, Vulnerable, Oppressed
- A negative-external one, comprising: Unaffectionate, Unsentimental, Indifferent, Hostile
- A positive-internal one, comprising: Active, Energetic, Resilient, Curious, Determined
- A positive-external one, comprising: Supportive, Compassionate

The emotion *Lonely* was not found to aggregate to a factor.

For each of the four factors we estimated a LMM including all possible interactions between fixed effects. Participants and type of emotion were set as random intercepts.

In particular, in the *lme4* syntax (Bates, Maechler, Bolker, & Walker, 2015), the model tested was:

$$\begin{aligned}
& \text{Intensity of emotions} \sim \text{Perceived usefulness of lockdown} \\
& \times \text{Feeling of living a normal life} \times \text{Coping strategies} + (1|\text{Participant}) \\
& + (1|\text{Emotion})
\end{aligned}$$

For each of the four models, we then performed a model selection using the *MuMIn* R package, with the *dredge* function (Bartoń, 2020). This procedure selects the best fitting model (i.e., the one with lowest Akaike information criterion, which returns an estimation of the quality of the model, AIC, Akaike, 1973) fitting all possible combinations of the fixed effects included.

For the negative-internal factor, the best model identified by the model selection included the feeling of living a normal life, while the other predictors were dropped. The model refitted after the model criticism procedure included 2220 observations (49 were removed), $Pseudo-R^2$ (total) = .55, $Pseudo-R^2$ (marginal) = .16. Specifically, the effects of the feeling of living a normal life was significant, $t(456.82) = -12.78$, $p < .001$, $b = -.79$, indicating that the higher participants felt to live a normal life, the lower the intensity of the emotions in the negative-internal factor.

For the positive-internal factor, the best model identified by the model selection included the perceived usefulness of lockdown and the feeling of living a normal life, while the other predictor was dropped. The model refitted after the model criticism procedure included 2228 observations (42 were removed), $Pseudo-R^2$ (total) = .57, $Pseudo-R^2$ (marginal) = .20. Specifically, the effects of both perceived usefulness of lockdown, $t(451.65) = 4.33$, $p < .001$, $b = .23$, and feeling of living a normal life, $t(453.36) = 10.43$, $p < .001$, $b = .71$, were significant, indicating that the higher their value, the higher participants' emotions intensity in the positive-internal factor.

For the negative-external factor, the best model identified by the model selection included the feeling of living a normal life, while the other predictors were dropped. The model refitted after the model criticism procedure included 1786 observations (29 were removed), $Pseudo-R^2$ (total) = .54, $Pseudo-R^2$ (marginal) = .13. Specifically, the effects of the feeling of living a normal life were significant, $t(451.51) = -11.21$, $p < .001$, $b = -.73$, indicating that the higher participants felt to live a normal life, the lower the intensity of the emotions in the negative-external factor.

For the positive-external factor, the model selection dropped all the fixed effects predictors, as the random-effect model was the one with the lowest AIC.

Discussion

In the present study we investigated in an Italian sample how several behavioral factors might affect people's psychological health. Participants were asked to answer several questions regarding the intensity of the mental states and the emotions experienced, as well as other factors, such as: i) the perceived usefulness of lockdown, ii) the feeling of living a normal life, and iii) the coping strategies implemented to face the pandemic. Results showed that the higher participants felt to live a normal life, the lower the intensity of the emotions in the negative-internal factor (Anxious, Fearful, Vulnerable, Oppressed) and in negative-external factor (Unaffectionate, Unsentimental, Indifferent, Hostile). Moreover, the higher the participants' perceived the usefulness of lockdown and the feeling of living a normal life, the higher the intensity of their emotions in the positive-internal factor (Active, Energetic, Resilient, Curious, Determined). No variable predicted positive emotions towards others (positive external factor, Supportive, Compassionate).

These findings suggest that the intensity of negative emotions, either internal or external, is lower when participants seem to be able to continue living a normal life, even when forced to stay at home, thus curtailing their social life by avoiding in-person direct contact with others. In a specular way, the intensity of positive emotions increases when participants experience the usefulness of the lockdown. In this case too, however, experiencing a level normalcy in everyday life, inspite of the lockdown and the pandemic, increases positive emotions.

Overall, feeling to be able to maintain a normal pattern of everyday activities turns out to be the best predictor of low negative emotions and increased positive internal emotions. People feel less anxious and fearful, and more energetic and resilient.

It is well known that various factors can undermine well-being, including perceived risk, which is negatively correlated with well-being (Cheng, 2006). Pèrez-Fuentes and colleagues (2020) focused on analyzing the emotional states resulting from the perception of the risk of being infected with COVID-19. The results showed that the perception of the risk from COVID-19 was positively correlated with negative emotional states such as sadness, depression, anxiety, anger and hostility. The authors argued that a negative emotional state increased both the perception of the risk from COVID-19 and the negative mood.

Our results add to these data, showing that people can cope with the greater perception of risk, and with the fear and anxiety generated by a pandemic. A greater sense of normalcy, helped people to cope with the fear and anxiety triggered by the realization that the pandemic was to stay, and the virus is to stay, and could again spread easily among the population.

244 Linked to this, our data also show that an important role is also played by perceiving the lockdown
 245 as a useful measure, protective against contagion. Considering the lockdown as being useful
 246 predicts stronger positive feelings, and a greater ability to cope with the contingent situation (more
 247 resilient, more energetic, more active). At the time, news, social networks and government
 248 guidelines were telling citizens that the world was halting any social activity. As documented by
 249 WHO reports, the disruption of daily routines as a result of the restrictions driven by the
 250 government guidelines added stress to many people's work and family lives (e.g., school closures
 251 that force parents to attend home school while working from home themselves), increasing the rate
 252 of depression, loneliness, self-harm, suicidal behavior and increased consumption of alcohol and
 253 drugs (WHO, 2020). The results that emerge from the study presented in this paper again
 254 complement data showing the disruptive force of lockdown on psychological well-being, as they
 255 reveal how important can be the possibility to understand and accept the usefulness of a lockdown.
 256 It follows that it is crucial, not just as a measure of social policy, but also for the very psychological
 257 well-being of the population, that governments provide a clear, correct communication of the aims
 258 of a lockdown, that conveys the need to implement policies that protect citizens, and the society
 259 as a whole, from a clear danger, even if it necessarily limits personal liberties.

260 The present findings also extend the results of recent studies, which focused on the adherence to
 261 quarantine restrictions and recommendations. Marchetti and colleagues (in press) also found that
 262 during the initial lockdown the perceived usefulness of lockdown measures positively affected
 263 people's emotions, suggesting that behavioral measures devised to increase people's commitment
 264 to the proposed societal rules are crucial in order to enhance people's wellbeing. While in the
 265 Marchetti and colleagues (in press) study the best model explaining the data included only
 266 perceived usefulness of lockdown measures, in the present study on the third wave of COVID-19
 267 we included in the model all factors examined.

268 Critically, instead of evaluating only data relating to mental distress in the Italian population during
 269 the pandemic (e.g., Rossi et al. 2020), our findings highlight the positive effects of the ability to
 270 adapt to new situation, and become able to move from a state of emergency to a state of new
 271 normality, experiencing the new life-style 'as usual'. In line with this, Restubog and colleagues
 272 (2020) argued that emotional regulation is the adaptive key to cope with lifestyle changes resulting
 273 from the pandemic, since it can reduce negative mental states and strengthen coping strategies for
 274 a greater psychological well-being. It is important to note, in this respect, how the role of coping
 275 strategies and 'life as usual' change between the first (no role) and the third phase (a crucial role),
 276 probably indicating a greater psychological complexity of the moment experienced in the third

phase, and probably underlining the development (or strengthening) of protective behaviors by the population in the period between the two phases

It remains to be seen if active coping strategies helped during the third wave of the pandemic. Previous studies (Stieg, 2020) showed that recreational activities used as coping strategies play a fundamental role to face the pandemic. However, singing, watching movies, talking with friends, and similar activities that were examined in our study, did not result significant in our analyses. Nonetheless, we do not think their role should be completely dismissed. In a previous study, also on the Italian population, it was shown that implementing positive activities helped reduce negative emotions, in particular internal emotions, and reduce fear and anxiety, while at the same time increment positive emotions, such as resilience, as well as the level of energy experienced (Marchetti et al, in press). While in the literature it is typically examined how positive emotions promote coping in stress situations (Moskowitz et al., 2020), in that study it was highlighted how coping helps promote positive emotions in conditions of elevated stress. That study, however, was carried out during the first wave of the pandemic in Italy, which was extremely severe. In that case people were actively coping with the emergency and the acute level of stress by organizing balcony or window meetings, collective singing, collective shows of solidarity, as well as individual activities, such as cooking, daily physical exercise, and much else. During the third wave these activities were much less frequent, and the sense of emergency had probably changed into a sense of normality of a new lifestyle. In other words, it is likely that during the third wave the sense of heroic emergency of the first wave had given way to a ‘new normality’, and it is such sense of normality that was now related to a more positive view of the current situation, and to greater wellbeing. During the initial emergency, in order to reduce the intensity of negative emotions, one needed to implement coping strategies such as recreational activities to face the dangerous novelty of the pandemic, and the new experience of a curtailed lifestyle. Such need no longer existed when greater knowledge was acquired about the virus, information on potentially effective vaccines was communicated, and people realized that the virus would probably become endemic and one would need to learn to live with it.

Even if the study provides important information on how people cope with a pandemic, there are potential limitations. For example, the sample might not be homogeneous for sex and age and this could make the study not fully generalizable. Moreover, the measurements of emotions were assessed using self-reports, which may not accurately reflect participants’ emotional status. However, the topic investigated here can be very promising for future research, as it complements the vision on psychological well-being in a pandemic scenario, trying to present additional information on how people react, in a positive way, to a pandemic and a lockdown. It shows that

important information can be acquired when the aim of research is not exclusively focused on the negative effects of a pandemic, making it possible to complete the picture of wellbeing during a prolonged pandemic event.

In conclusion, the present study shows that the presence of acceptance attitudes toward restrictive measures and the experience of regained ‘normalcy’ can help overcome moments of difficulty, and experience increased positive emotions and decreased negative ones. Considering previous results of the literature and our results together, we would argue that knowing the emotional and cognitive effects of the lockdown on the population would help to increase measures which facilitate the acceptance of regulations aimed at protecting the health of citizens.

Declaration of interest statement

We have no conflicts of interest to disclose.

Author’s contribution

Study design: GM, MM, LI

Data collection: MM

Statistical analysis: MM, DG

Data interpretation: MM, DG, GM, LI

Manuscript preparation: MM, DG, GM, LI

Literature search: MM, GM

Data availability statement

The data analyzed in the present study are available here:

<https://github.com/danielegatti23/Psychological-well-being-COVID-19-third-wave-Italy->

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