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Recovery from the COVID-19 pandemic: Distress and resilience

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1. Introduction

The COVID-19 pandemic originated in China towards the end of 2019 and within a few months, had spread to 213 countries and territories, claiming 445,535 lives and over 8.2 million confirmed cases worldwide [1] as of June 18th, 2020. Emerging pandemics are characterized by several universal uncertainties, including the risk of infectivity, the speed of disease transmission and communicability, the disease incubation period, the duration of the infectious time, effective medical care and medications, the time required to develop a vaccine and more [2]. Furthermore, pandemics cause more than just health crises as they also impact the economic, social, and even political systems and may also lead to theories of conspiracy regarding their origin, thus posing a substantial challenge to the afflicted countries [3,4] (see Fig. 1).

The COVID-19 pandemic raised several concerns that should be considered by both practitioners and researchers, given the fact that such an extensive pandemic did not occur in modern times [5–7]. One fundamental issue is what factors enhance or impede the successful or unsuccessful coping of individuals with the continued crisis over time. Recent studies indicated that the COVID-19 pandemic, and the quarantine that was instated, negatively impacted the psychological well-being and enhanced the distress among the general population, increasing levels of anxiety, depression, post-traumatic stress disorder (PTSD) and sleep deprivation [8–11].

It is of vital importance to identify elements that may predict successful coping as well as to understand the process of recovery. The main aim of the present study was to examine possible changes in two major factors relevant to the COVID-19 crisis: distress and resilience, in the gradual process of recovery. Furthermore, this study examines the contribution of three levels of resilience (individual, community, and national), perceived well-being, as well as demographic characteristics relevant to the process of recovery.

The current study was conducted in Israel and was based on two repeated measurements: one gathered during the peak of the crisis (T1), which included the overall lock-down of the Israeli society, and the second approximately two months later, upon the initial phase of lifting the lock-down (T2). The main difference between the two

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The COVID-19 pandemic is a clear and tangible threat to all human beings since currently there is no effective vaccine or cure for the illness. As a result, this threatening and painful pandemic undermines people’s basic sense of security and increases distress symptoms. In the present study, we examined two possible stress responses raised by the COVID-19 crisis: (a) A lingering sense of danger, which was found to decrease individual resilience and played a major role in post-war adaptation (e.g., Ref. [12,13]). (b) Distress symptoms, including continuous emotional and behavioral problems [14], such as depression, anxiety, and grief [15]. We assumed that the levels of sense of danger and distress symptoms indicated the levels of coping with the present COVID-19 crisis.

Besides, we assumed that these two indicators would decrease in intensity in the second measurement considering the improvement in the pandemic distribution.

2. Method

The data for the current study included responses of 300 Israeli Jewish participants to an online questionnaire. The respondents agreed to participate in the study several times. The data were collected by an Internet company, that employs a panel of more than 65,000 residents of all demographic sectors and geographic locations of Israel, (http://sekernet.co.il/). A stratified sampling method was used, aligned with the data published by the Israeli Central Bureau of Statistics, to appropriately include the varied groups of the Israeli population concerning gender, age and geographic dispersal.

The first measurement was conducted at the peak of the COVID-19 pandemic in Israel (March 19–20, 2020), during which an overall lockdown policy was directed, and required the entire Israeli population except for employees in vital services, to remain at home 24/7. The second measurement was conducted at the initial phase lifting the overall lockdown (May 5–7, 2020), during which the public was allowed to gradually return to normal functioning. All data were gathered anonymously, following approval of the IRB of Tel Aviv University. All participants signed an informed consent form before filling out the questionnaires. Table 1 presents the demographic characteristics of the research sample.

2.1. Instruments

**Sense of danger.** A seven-item sense of danger scale was employed, based on Solomon and Pragier’s [31] scale that referred to a lingering sense of danger in the context of security threats. However, instead of the term “security”, the threat was modified to the “COVID-19 pandemic threat” in all of the relevant questions (e.g., “To what extent are you concerned about the increase of the COVID-19 global crisis?”). Furthermore, one item was added to the scale: “To what extent are you worried that we will not be able to overcome the COVID-19 crisis and many citizens in our country have died from this disease?”. Responses were rated on a Likert-like scale ranging from 1 (not at all) to 5 (very much). The Cronbach alpha reliability of this scale in the present study was high (α = 0.82 at T1 and α = 0.84 at T2).

**Distress symptoms.** The level of individual distress symptoms, in the context of the COVID-19 pandemic; was determined by nine items from the Brief Symptom Inventory (BSI [32], about anxiety and depression. This inventory was scored on a Likert scale ranging from 1 (not suffering at all) to 5 (suffering very much). For example, “How much do you suffer from feelings of a sudden fear with no reason?”.
The present measure of well-being was based on the Recovery from War Scale [36,37]. This 9-item self-report scale described perceived individual strengths in the domains of work, health, recreation, wider social contacts, achievements, family relations, daily functioning, relations with friends, and general assessment of one’s life. The 6-point response scale ranged from 1 = not good at all to 6 = very good. The Cronbach alpha reliability of this scale in the present study was high (α = 0.82 at T1 and α = 0.87 at T2).

**Demographic variables.** Seven demographic attributes were examined: (a) Age; (b) Gender; (c) Religion: assessed by one item with a 4-point scale ranging from 1 = secular to 4 = ultra-orthodox; (d) Family income level assessed by one item with a 5-point response scale ranging from 1 = much below average to 5 = much above average; (e) Education: assessed by one item with a 5-point response scale ranging from 1 = elementary school to 5 = master’s degree and above. (f) Political attitudes: assessed by one item with a 4-point scale ranging from 1 = extreme left to 5 = extreme right. (g) The size of the community was assessed by one item with a 5-point scale ranging from 1 = up to 1000 residents to 5 = 50,000 and above residents. (h) The number of children was assessed by one item with a 5-point scale ranging from 1 = no children to 5 = four children and more. (i) Economic difficulties: assessed by one item “Are you or your family experiencing financial difficulties due to the COVID-19 crisis (such as unemployment, downsizing business operations, and so on)?” The scale ranged from 1 = not at all to 5 = very much.

3. Results

Data processing was based on the following analyses:

A. Pearson Correlations. First, we calculated Pearson correlations among the research psychological variables across the two repeated measurements (Table 2). Results indicated the following: Most correlations among the six variables (sense of danger, distress symptoms, individual, community and national resilience, and well-being) were similar across the two measurement times, in their direction and level of significance. Sense of danger and distress symptoms correlated significantly and positively with each other. They also correlated significantly but negatively with individual and community resilience (but not with national resilience) and well-being, across the two measurements. The higher the level of individual resilience, community resilience, and well-being, the lower the level of distress. The only dissimilar correlation that was identified was across the two measurements was between sense of danger and community resilience. In the initial phase of the COVID-19 crisis (T1), no significant correlation was found, while in the second measurement that was conducted at the beginning of the recovery phase (T2), a negative and significant correlation was displayed. Overall, the associations among the examined variables were stable across the two times of measurement despite the substantial diversity in the COVID-19 crisis itself.

Second, we calculated Pearson correlations between the demographic characteristics and the two distress variables, across the two measurements (Table 3). Results indicated the following: (a) Economic difficulties due to the COVID-19 correlated highest with a sense of danger and distress symptoms, in T2. The stronger the economic difficulties, the higher the sense of danger and distress symptoms reported. (b) The number of children significantly correlated with a sense of danger and distress symptoms across the two measurements. The more children, the higher the sense of danger and distress symptoms reported. (c) Education level correlated significantly and negatively with a sense of danger and distress symptoms in T2 but not in T1: The higher the education, the lower the distress reported in T2. (d) Age correlated significantly and negatively with distress symptoms (but not with a

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Table 1

| Variable                        | Rating scale and range | Frequency | Percent | M   | SD  |
|---------------------------------|------------------------|-----------|---------|-----|-----|
| Age groups                      |                        |           |         |     |     |
| 1.8-30                          |                        | 81        | 27      | 42.46 | 15.66 |
| 2.3-40                          |                        | 76        | 25      | 25   |     |
| 3.4-50                          |                        | 49        | 16      |      |     |
| 4.5-60                          |                        | 46        | 15      |      |     |
| 6.6-10                          |                        | 48        | 16      |      |     |
| Gender                          |                        |           |         |     |     |
| 1. Males                        |                        | 176       | 59      |      |     |
| 2. Female                       |                        | 124       | 41      |      |     |
| Level of religiosity            |                        |           |         |     |     |
| 1. Secular                      |                        | 139       | 46      | 1.79 | .88 |
| 2. Traditional                 |                        | 98        | 33      |      |     |
| 3. Religious                   |                        | 49        | 16      |      |     |
| 4. Vary religious               |                        | 14        | 5       |      |     |
| Family income                   |                        |           |         |     |     |
| Much lower                      |                        | 71        | 24      | 2.58 | 1.19 |
| Lower                           |                        | 70        | 23      |      |     |
| Average                         |                        | 89        | 30      |      |     |
| Higher                          |                        | 53        | 17      |      |     |
| Much higher                     |                        | 17        | 6       |      |     |
| Education                       |                        |           |         |     |     |
| Elementary                      |                        | 1         | 0       |      |     |
| High school                     |                        | 81        | 27      |      |     |
| Above high school               |                        | 107       | 36      |      |     |
| Political attitudes             |                        |           |         |     |     |
| 1. Extreme left                 |                        | 4         | 1       | 3.53 | .87 |
| 2. Left                         |                        | 31        | 10      |      |     |
| 3. Center                       |                        | 102       | 34      |      |     |
| 4. Right                        |                        | 128       | 43      |      |     |
| 5. Right                        |                        | 35        | 12      |      |     |
| Size of community               |                        |           |         |     |     |
| 1. up to 1000                   |                        | 10        | 3       |      |     |
| 2.1001-5000                    |                        | 12        | 4       |      |     |
| 3.5001-10,000                   |                        | 8         | 3       |      |     |
| 4.10,001-50,000                 |                        | 153       | 51      |      |     |
| 5.50,001 - on                   |                        | 117       | 39      |      |     |
| Number of children              |                        |           |         |     |     |
| 1. no children                  |                        | 120       | 40      | 1.73 | 1.82 |
| 2. one child                    |                        | 27        | 9       |      |     |
| 3. two children                 |                        | 49        | 16      |      |     |
| 4. three children               |                        | 60        | 20      |      |     |
| 5. four children and on         |                        | 59        | 20      |      |     |
| Economic difficulties           |                        |           |         |     |     |
| 1. Not at all                   |                        | 51        | 17      | 2.84 | 1.27 |
| 2. A little                     |                        | 81        | 27      |      |     |
| T1                              |                        |           |         |     |     |
| 3. Medium                       |                        | 69        | 23      |      |     |
| 4. Much                         |                        | 64        | 21      |      |     |
| 5. Very much                    |                        | 35        | 12      |      |     |
| Economic difficulties           |                        |           |         |     |     |
| 1. Not at all                   |                        | 60        | 20      | 2.73 | 1.27 |
| 2. A little                     |                        | 81        | 27      |      |     |
| T2                              |                        |           |         |     |     |
| 3. Medium                       |                        | 74        | 25      |      |     |
| 4. Much                         |                        | 51        | 17      |      |     |
| 5. Very much                    |                        | 34        | 11      |      |     |

Included. The Cronbach alpha reliability of this scale in the present study was high (α = 0.87 at T1 and α = 0.90 at T2).

**Individual resilience.** Individual resilience was measured by a 10-item Connor-Davidson scale (CD-RISC 10 [33], portraying individual feelings of ability and power in the face of difficulties [34]). This scale was rated on a 5-point Likert scale ranging from 1 = not true at all, to 5 = generally true. The Cronbach alpha reliability of this scale in the present study was high (α = 0.86 at T1 and α = 0.89 at T2).

**Community resilience.** Perceived community resilience was determined by a short version of the CCRAM scale (CCRAM10: [35]). Ratings for its 10 items ranged from 1 = do not agree at all, to 5 = totally agree. A sample item from the CCRAM 10: "I can depend on people in my town to come to my assistance in a crisis". The Cronbach alpha reliability of this scale in the present study was high (α = 0.93 at both T1 and T2).

**National resilience.** A short version of the National Resilience Scale was employed [28]. This 13-item tool pertained to trust in national leadership, patriotism, and trust in major national institutions. (e.g., "I love my country and am proud of it"). In this study, we added three items regarding the COVID-19 crisis (e.g., "I have full faith in the ability of my country’s health system to care for the population in the current coronavirus crisis"). The 6-point response scale ranged from 1 (very strongly disagree) to 6 (very strongly agree). The Cronbach alpha reliability of this scale in the present study was high (α = 0.91 at both T1 and T2).
sense of danger) across the two measurements: The older the individual, the lower the level of distress reported. (c) Women reported a higher level of sense of danger and distress symptoms, across the two measurements, compared with men (f). (d) The level of religiosity did not correlate significantly with sense of danger or distress symptoms, across the two measurements. (g) Political attitudes correlated significantly with sense of danger at T1 but not at T2: The more right-wing political attitudes were associated with a higher sense of danger in T1. (h) Attitudes were associated with a higher sense of danger in T1. (i) Overall, there were high similarities among the correlations of demographic characteristics and the sense of danger and distress symptoms, across the two measurements. (j) Overall, there were high similarities among the correlations of demographic characteristics and the sense of danger and distress symptoms, across the two measurements.

### Table 2

Averages, standard deviations and Pearson correlations among sense of danger, distress symptoms, three-level of resilience and well-being across two repeated measurements (N = 300).

| Variables          | Time   | 1     | 2     | 3     | 4     | 5     | 6     |
|--------------------|--------|-------|-------|-------|-------|-------|-------|
| Sense of Danger    | T1     | 2.84  | 2.34  | 3.51  | 4.05  | 3.30  | 3.97  |
|                    | T2     |       |       |       |       |       |       |
| Distress symptoms  | T1     | 2.47  | 2.21  | 3.57  | 4.15  | 3.28  | 3.87  |
|                    | T2     |       |       |       |       |       |       |

**p < .01, ***p < .001; Shaded cell represents differences between the two repeated measures.

### Table 3

Pearson correlations between a sense of danger and distress symptoms and demographic characteristics, across two repeated measurements (N = 300).

| Variables          | Time   | Age | Gender | Religiosity | Average family income | Education | Political attitudes | Size of community | Number of children | Economic difficulties due to crisis |
|--------------------|--------|-----|--------|-------------|-----------------------|-----------|---------------------|-------------------|-------------------|-----------------------------------|
| Sense of danger    | T1     | .099| .225***| .003        | -.132*                | -.075     | .152**              | .082              | -.122*             | .214***                           |
| Distress symptoms  | T1     | .205***| .170**| .077        | -.123*                | .016      | -.035               | .016              | -.144**             | .261***                           |
|                    | T2     | -.063| .156**| .031        | -.144*                | .041      | .036                | .163*             | .254***             |                                   |
|                    | T1     | -.217***| .142*| -.059       | -.119*                | -.028     | .096               | -.219***          | .234***             |                                   |
|                    | T2     |       |       |             |                       |           |                    |                   |                   |                                   |

*p < .05, **p < .01, ***p < .001; the shaded cells represent differences between the two repeated measures.

### Table 4

General Linear Model- two repeated measures of sense of danger, distress symptoms, levels of resilience, well-being, and economic difficulties, (N = 300).

| Variable          | T1 (peak of closure) | T2 (exit from closure) | Partial Eta Square | Change direction |
|-------------------|----------------------|------------------------|--------------------|-----------------|
| Sense of danger   | M 2.84               | M 2.47                 | .263               | Decrease        |
| Distress symptoms | M 2.345              | M 2.191                | .017               | Decrease        |
| Individual resilience | 3.516               | 3.572                  | .017               | No change       |
| Well-being        | 4.058                | 4.158                  | .017               | Increase        |
| Community resilience | 3.303              | 3.286                  | .017               | No change       |
| National resilience | 3.977               | 3.863                  | .017               | Decrease        |
| Economic difficulties | 2.84                | 2.73                   | .017               | No change       |

*p < .05, **p < .01, ***p < .001.
results indicated, as expected, that individual resilience and well-being significantly and negatively predicted the sense of danger and the distress symptoms, across the two measurements. The higher the individual resilience and well-being, the lower the sense of danger and distress symptoms that were reported. Community resilience predicted a significant sense of danger at T2 and distress symptoms at T1, while the national resilience did not significantly predict the two distress variables. The four psychological predictors accounted for 12% (T1) and 18% (T2) of the sense of danger variance, and 26% (T1), and 30% (T2) of the distress symptoms variance.

Model two examined eight demographic characteristics. The results indicated that the best predictor of sense of danger and distress symptoms was economic difficulties due to the COVID-19 pandemic in both T1 and T2: The greater the economic difficulties, the higher the level of distress symptoms. The second-best predictor was gender: Women reported a higher level of sense of danger (at T1 but not at T2) and higher distress symptoms across the two measurements. All the other demographic characteristics did not significantly predict distress or predicted it only one time: the number of children predicted sense of danger only in T2, while political attitudes predicted a sense of danger only in T1. The eight demographic predictors together explained 11% (T1) and 10% (T2) of the variance of the sense of danger measurement and 14% (T1) and 12% (T2) of the variance of the distress symptoms measurement.

Model three included only predictors that were found to be significant in models one or two. The model included three psychological and two demographic predictors. The best predictor was well-being followed by individual resilience. The five predictors together explained 14% (T1) and 18% (T2) of the variance of the sense of danger measurement and 31% (T1) and 34% (T2) of the variance of the distress symptoms measurement.

4. Discussion

The COVID-19 pandemic has caused significant morbidity and mortality worldwide, and thus it is natural to expect that varied populations who are threatened will express an elevated sense of danger, distress symptoms, and lower levels of resilience [3,4]. Numerous studies have presented the effect of emergencies at large, and pandemics specifically, on the well-being of individuals and societies [39,40]. Current research has shown that the COVID-19 pandemic, and the following restrictive measures adopted to counter the spread of the virus, has lead to major negative psychological outcomes, such as increased levels of anxiety and distress in the population [8,10,11,41,42], as well as major economic difficulties [43].
It has been observed that the changes that evolve in these variables over time, most especially in the recovery period of the crisis, have not been substantially investigated, and more focus on their evolvement is needed [44]. Based on two repeated measurements, the current study examined the changes in the impact of the COVID-19 crisis on sense of danger, distress symptoms, perceived well-being as well as levels of resilience, across two periods of time: at the peak of the COVID-19 crisis during which the residents of Israel were under complete lockdown (T1), and at the beginning of the exit phase, during which public institutions and workplaces began to open one after another (T2).

Our findings indicate that the best predictors of sense of danger and distress symptoms, at both the peak of the crisis and the first stage of the recovery process, are individual resilience and well-being, which shared a similar degree of predictability. This result corroborates earlier studies that presented the central role of individual resilience and well-being as predictors of better coping with varied hazards, such as the COVID-19 crisis and security threats [26,30,40,45]. Moreover, it seems that, compared with distress regarding security threats, the role of individual resilience and well-being in coping with pandemic threats is even more important [46]; submitted; [47]. One potential explanation for this is that the public is less familiar with pandemics, and thus they present unprecedented stressors and a bigger challenge to overcome [39]; Nitschke et al., 2020). According to researchers, the basic capacities of individual resilience and perceived well-being act as vital protective factors that accentuate the ability to continue to function or even "bounce forward" [40,48].

Moreover, our study indicates that individual resilience is maintained even without economic support from the state. This finding does not match the argument according to which, social support is needed, and without it, maintaining resilience after a disaster is difficult [49]. It should be noted, however, that the current study’s T2 data were gathered shortly after the lockdown release. Thus, this pattern of results concerning individual resilience may reflect the public’s (somewhat naive) hope that “it’s all over and we can go back to our former way of living now”. Yet, since then, it seems that this assumption has not been fully fulfilled. Therefore, it can be assumed that if the economic crisis goes on and even deteriorates, individual resilience may be affected. Moreover, if this happens, the assumption of Aldrich [49] concerning the essentiality of social support will be confirmed. This assumption should be further explored.

Results also suggest that even though the death toll in Israel, compared with other countries, has been relatively low, a decline in several aspects of national resilience has been found, including levels of trust in the government, the parliament, and Israeli society at large. A possible explanation for the decline in national resilience may be derived from the substantial economic crisis that Israel experienced and the high rates of unemployment (e.g., Refs. [50,51]). It seems that the explanation for this decline of national resilience is rooted in the disappointment of many Israelis with the insufficient economic assistance the Israeli government provides to various sectors that are highly affected by the COVID-19 crisis [52,53]. An additional explanation may connect the decrease in the national resilience with the ongoing political crisis that has characterized the country for over a year [26,54]. These explanations require further research support.

Of the demographic variables examined in the study as predictors of sense of danger and distress symptoms, the most significant predictor was economic difficulties originating during the COVID-19 crisis. These difficulties indicate the impact of the situation on the feelings of the respondents, mainly in light of the relatively low contribution of the other demographic variables such as age, gender, income, and education. It may be concluded from these findings that the absence of financial aid and the feeling that the authorities are not sufficiently aware of the depth of the economic crisis and do not provide sufficient support is of great importance when considering the ability of the population to cope with the current crisis and its economic consequences [39,55]. The results of our study raise the impression that the current Israeli government is perceived as lacking in providing an effective response to the needs of the population in this respect [56]. Future research is needed to support this explanation.

### 4.1. Limitations and conclusions

One limitation of the research is the relatively limited size of the sample that responded to the questionnaire at the two timeframes. While this certainly should be considered, we believe that the findings nonetheless provide important insights regarding the factors that enhance or impede the public’s resilience, well-being, sense of danger, and distress symptoms, when coping with this unpredicted lethal pandemic.

In conclusion, COVID-19 presents an immense challenge to the global community, highly impacting the capacity of most societies to maintain their well-being and appropriate functioning. As such, understanding its ongoing repercussions, including the characteristics of recovery from COVID-19, require longitudinal studies that will shed light on the varied impacts on individuals, populations, and societies. This study contributes to this process by highlighting several predictors of coping with the COVID-19 pandemic. It indicates clearly that both demographic and psychological variables support management of the pandemic. The data present that women and individuals with economic difficulties are at higher risk of distress and sense of danger. Hence, the study calls for more research on the resilience of populations with already existing vulnerabilities to mitigate the ongoing repercussions of COVID-19.
pandemic over time are recommended.

Declaration of competing interest

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

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