

Brief-Report Covid-19

Risk factors for psychological distress during the COVID-19 pandemic in Israel: Loneliness, age, gender, and health status play an important role

Danny Horesh^{1,2*} , Rony Kapel Lev-Ari¹ and Ilanit Hasson-Ohayon¹ 

¹Department of Psychology, Bar-Ilan University, Ramat-Gan, Israel

²Department of Psychiatry, New York University School of Medicine, New York, USA

Objective. Research on the psychological toll of the COVID-19 pandemic is being conducted in various countries. This study aimed to examine risk factors for mental health problems among Israeli adults during this crisis.

Methods. A total of 204 participants took part in the study. They completed self-report questionnaires assessing perceived stress, anxiety, quality of life, and various questions related to quarantine, pre-existing health issues, and worries related to the virus. The study took place during the last two weeks of March 2020.

Results. The majority of participants reported relatively high levels of perceived stress and corona-related worries, but low levels of anxiety. Female gender, younger age, corona-related loneliness, and pre-existing chronic illness were all related to higher levels of psychological distress and lower levels of quality of life.

Conclusions. While considering the preliminary nature of these results, the current study highlights risk factors for psychological distress in light of the corona pandemic. Attention should be given to sociodemographic variables that were identified as related to psychological distress, as well as to the important role of loneliness, when screening and treating people during this crisis. More research is needed in order to fully understand the scope and correlates of psychological difficulties during these challenging times.

Statement of contribution

What is already known on this subject?

- Studies on the psychological implications of COVID-19 are being conducted in many countries, showing a wide variety of mental health problems, including depression, anxiety, and impaired functioning.
- In addition, some studies have begun identifying risk factors for psychological distress, including sociodemographic and health-related factors.

What does this study add?

- The present study adds to existing COVID-19 literature, by presenting findings on the pandemic's mental health implications, and their risk factors, in Israel.

*Correspondence should be addressed to Danny Horesh, Department of Psychology, Bar-Ilan University, Ramat Gan 5290002, Israel (email: danny.horesh@biu.ac.il).

The data that support the findings of this study are available from the corresponding author upon reasonable request.

- The study is also unique in its emphasis on the very acute phase of this crisis (first 10 days in Israel), thus shedding light on the initial psychological reactions of adults facing the pandemic.
- Its also includes a wide variety of risk factors, from several domains.

Studies about the psychological implication of the COVID-19 pandemic in various countries are gradually being published (e.g., Lauri Korajlija & Jokic-Begic, 2020; Qiu *et al.*, 2020), indicating moderate-to-high levels of distress among both medical staff (e.g., Huang *et al.*, 2020; Li *et al.*, 2020; 23.4%–44.7% for diverse psychopathologies, including anxiety and depression) and the general population (see Roy *et al.*, 2020; More than 80% preoccupied with thoughts of COVID-19, and close to 40% fearing infection and/or experiencing distress resulting from social media exposure). We present findings collected at Israel, where the Ministry of Health has led a highly conservative policy in managing the pandemic, including restricting movement to 100 m around one's house, closing all shops and malls, and moving to online teaching for months. Restrictions were announced very early, as soon as the first cases were identified in Israel.

Based on studies on previous global disasters, factors such as an elevated number of pre-disaster life stressors (e.g., being seriously ill, getting divorced) and younger age (Kuwabara *et al.*, 2008; Person *et al.*, 2006) may be associated with increased psychological distress. Nonetheless, findings have been inconclusive. Previous studies conducted during health pandemics have also shown a wide variety of factors associated with distress, including sociodemographic variables (e.g., younger age, low education level), as well as psychological factors such as intolerance of uncertainty, coping style, and more (Taha *et al.*, 2014; Taylor *et al.*, 2008). Factors that are unique to the COVID-19 pandemic should also be considered, including the implications of movement limitations and pre-existing physical health. Quarantine may carry substantial psychological implications, including post-traumatic stress disorder, anger, and confusion (Brooks *et al.*, 2020). Importantly, Brooks and colleagues emphasize that most of these adverse effects stem from the imposition of a restriction of liberty, as well as from inadequate information received by those in quarantine. Preliminary findings on psychological aspects of COVID-19 also show that female gender (Qiu *et al.*, 2020) and having a relative who is infected with the virus are risks factors for distress (Cao *et al.*, 2020).

This study aims to shed light on COVID-19-related psychological distress and its correlates among Israeli adults. We report preliminary findings on the role of the following factors in psychological distress: (1) sociodemographic factors (e.g., gender, age, income); (2) pre-existing physical health; (3) factors related specifically to the COVID-19 circumstances: quarantine (myself/others I know), being infected (myself/others I know), worries about the virus, feeling alone in light of the virus.

Methods

Participants

A total of 204 adults participated in the study. Inclusion criteria were as follows: (1) Age 18 and above. (2) Residing in Israel at the time of the survey. (3) Able to read and understand Hebrew well. One participant was excluded as she was an Israeli living abroad at the time of the assessment.

Procedure

After obtaining ethical approval from the PIs' University Ethics Committee, participants were recruited via snowball and virtual snowball sampling. Ads with a link to Qualtrics questionnaires were posted on Facebook, as well as sent via email and WhatsApp to multiple contacts, including members of the research team, colleagues, and acquaintances. From there, participants passed the link to their friends and acquaintances. Informed consent was obtained via Qualtrics, on a separate file, disconnected electronically from the questionnaire. The study began immediately when authorities announced the first major restrictions. Questionnaires were completed between 15 and 25 March 2020. This short time period was chosen in order to assess responses during the initial, acute phase of this crisis. Thus, after 10 days, we decided to analyse data from the 204 individuals who responded up to then.

Measures

Sociodemographic and health questions assessed family status (married/in a relationship/single), education, income (compared to average salary), having children, religiosity (secular/traditional/religious), and whether the respondent or someone from his/her family (two questions) have a pre-existing chronic illness (Yes/No).

Questions about COVID-19 circumstances assessed: (1) whether one was/knew someone who was in home quarantine, and whether one was/knew someone who was infected by COVID-19 (Yes/No); (2) feeling alone in light of the crisis; (3) feeling worried about the virus; (4) feeling worried that I/someone close to me would be infected (two separate questions); (5) feeling worried about one's financial condition. Items 2–5 were assessed on a 5-point scale from 'not at all' to 'very much'.

Perceived Stress Scale (Cohen *et al.*, 1983) includes 10 items assessing the degree to which situations in one's life during the past week were appraised as unpredictable, uncontrollable, and overwhelming, from 0 (never) to 4 (very often). Scores were summed for analyses, and established cut-off scores were also employed.

The Beck Anxiety Inventory (Beck *et al.*, 1988) includes 21 items measuring symptoms of anxiety during the past week from 0 (not at all) to 3 (severely). Scores were summed for analyses, and established cut-off scores were also employed.

The World Health Organization Quality of Life Scale-Brief Version (The WHOQOL Group, 1998) includes 26 items covering four QOL domains (psychological, physical, social, and environmental). Items are rated from 1 (Not at all) to 5 (An extreme amount). Scores for each subscale were summed for analyses.

Statistical analysis

To address the first study aim, we calculated frequencies of distress (stress, anxiety, worry about COVID-19). To address the second aim, Pearson correlations, chi-square, *t* tests, and analysis of variance were calculated, to assess specific correlates of distress (e.g., gender, age, physical health, loneliness). Subsequently, regression analyses assessed the contribution of significant risk factors *beyond* the effects of other factors.

Results

Sample characteristics

Of 204 participants, 71.1% (145) were female and 28.9% (59) male. Mean age was 45.86 ($SD = 19.65$; range: 21–84). 51% (103) were married and 63.7% (130) reported having children. Additionally, 80.4% (160) identified as secular, and only 19.6% (39) were traditional or religious. 46.1% (94) had an above-average income, while 23% (47) and 30.9% (63) reported average/below average income, respectively. 20.1% (41) reported a pre-existing chronic illness.

Descriptive statistics: Psychological distress

Our first aim was to understand the scope of distress among Israelis coping with the COVID-19 crisis. When asked about COVID-19 concerns specifically, 48% ($N = 98$) reported that they were 'very worried' to 'very much worried'. Only 13.8% ($N = 28$) reported that they were not worried/slightly worried. When employing the established PSS cut-offs, most participants (59.1%, $N = 120$) reported moderate stress levels, followed by 38.4% ($N = 78$) with low stress, and 2.5% ($N = 5$) with high stress. However, anxiety levels, based on established BAI cut-off scores, were quite low (89.1%, $N = 171$, reported 'minimal' anxiety).

Factors associated with psychological distress

The second main aim of this study was to examine potential risk factors for psychological distress during the COVID-19 pandemic. Results related to several groups of factors are presented below.

Sociodemographic factors

Females reported higher stress levels ($M = 15.83$, $SD = 5.65$) than males ($M = 14.05$, $SD = 6.09$) ($t_{(201)} = -1.98$, $p < .05$), as well as higher levels of worry about the virus (females: $M = 3.62$, $SD = 0.94$, males: $M = 3.07$, $SD = 0.89$) ($t_{(202)} = -3.88$, $p < .001$) and its effects on one's financial status (females: $M = 3.43$, $SD = 1.12$, males: $M = 3.02$, $SD = 1.04$) ($t_{(202)} = -2.47$, $p < .05$). Females also reported more worry that those close to them would be infected ($M = 3.75$, $SD = 1.09$) compared to males ($M = 3.32$, $SD = 0.96$) ($t_{(202)} = -2.64$, $p < .01$).

As shown in Figure 1, most younger participants reported moderate-high stress, with the opposite pattern among the two oldest age groups ($\chi^2_{(4)} = 23.41$, $p < .001$).

MANOVA showed that the youngest age group reported lower QOL (Psych: $M = 65.89$, $SD = 16.96$; Soc: 60.02, $SD = 20.18$; Envir: 68.75, $SD = 15.53$) than the two oldest age groups (61-75: Psych: $M = 78.79$, $SD = 11.28$; Soc: 71.59, $SD = 16.60$; Envir: $M = 83.66$, $SD = 12.57$; age 76+: Psych: 77.92, $SD = 10.99$; Soc: 68.54, $SD = 12.13$; Envir: 81.25, $SD = 9.07$) (Pillai's Trace_(16, 688) = 2.73, $p < .001$). Age was also negatively correlated with anxiety ($r = -.213$, $p < .01$) and financial worries ($r = -.26$, $p < .001$).

Income was negatively correlated with stress ($r = -.32$, $p < .001$) and anxiety ($r = -.25$, $p < .01$). Furthermore, compared to those married/in a relationship, single participants reported more fear that people close to them would get infected ($F_{(2,201)} = 5.77$, $p < .01$), and lower levels of psychological ($F_{(2,178)} = 5.59$, $p < .01$)

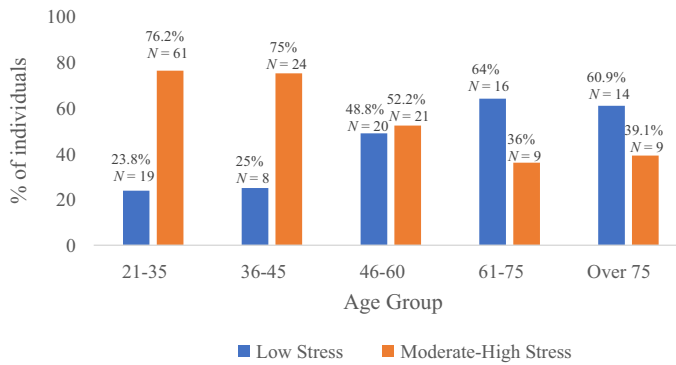


Figure 1. Levels of perceived stress in different age groups.

and social ($F_{(2,178)} = 10.32, p < .001$) QOL. Finally, having children was associated with reduced stress ($t_{(201)} = -4.840, p < 0.001$) and anxiety ($t_{(201)} = -4.840, p < 0.001$), and increased physical ($t_{(178)} = 3.615, p < 0.001$) and psychological ($t_{(178)} = 5.584, p < 0.001$) QOL.

Factors related to COVID-19 circumstances

No significant associations were found between stress/anxiety/QOL and being/knowing someone in home quarantine, or being infected/knowing someone infected. However, feeling alone due to the pandemic was positively associated with stress ($r = .45, p < .05$), anxiety ($r = .31, p < .001$), worry about the virus ($r = .28, p < .001$), financial worries ($r = .27, p < .001$), fearing infection ($r = .17, p < .05$), and negatively associated with all QOL domains (correlations between $-.22$ - $-.29$).

Physical health factors

Participants with pre-existing chronic conditions (e.g., diabetes, high blood pressure, asthma, arthritis) reported increased worry about infection ($t_{(202)} = -2.11, p < .05$) and lower physical QOL ($t_{(178)} = 2.32, p < .05$), compared to those with no condition. Having a family member with a chronic medical condition was positively associated with worries about infection among someone close ($t_{(202)} = -2.56, p < .05$) and financial worries ($t_{(202)} = -2.62, p < .01$).

Multivariate regressions

Factors found to be significantly associated with distress were subsequently analysed in six regression analyses: for stress, anxiety, and all QOL domains. Table 1 presents the final regression model for stress and physical QOL, as they showed the strongest effects (see supplementary material for other tables). Independent variables were entered in three steps: (1) sociodemographic variables; (2) feeling alone due to COVID-19; (3) pre-existing physical health.

As shown, feeling alone and having a physical condition were associated with stress and physical QOL. Younger age was associated with stress, and lower income was associated with impaired physical QOL. In other regressions, feeling alone was associated

Table 1. Hierarchical regressions: correlates of perceived stress and physical QOL

	Unstandardized coefficients			Standardized coefficients			Unstandardized coefficients			Standardized coefficients		
	B	SE	p-value	β	t	p-value	B	SE	β	t	p-value	
Dependent variable:												
Perceived stress												
(Model $R^2 = .348$)												
Gender	.31	.79	.70	.024	.39	.70	-1.74	2.57	-.05	-.68	.50	
Age	-.08	.03	.002	-.28	-3.07	.002	-.07	.09	-.09	-.80	.42	
Income	-.72	.50	.15	-.11	-1.44	.15	3.27	1.57	.19	2.08	.039	
Family status	-.64	.46	.16	-.09	-1.40	.16	2.18	1.44	.12	1.52	.13	
Has children	.18	1.07	.87	.02	.17	.87	-5.20	3.40	-.17	-1.53	.13	
Feeling alone	2.09	.35	.000	.38	5.99	.000	-3.64	1.11	-.24	-3.28	.001	
Diagnosed w/chronic condition	2.16	.92	.020	.15	2.35	.020	-6.83	2.90	-.18	-2.36	.020	
Dependent variable:												
Physical QOL												
(Model $R^2 = .185$)												
Family relative w/chronic condition	-.35	.73	.64	-.03	-.48	.64	.30	2.29	.01	.13	.90	

with reduced environmental and social QOL, and elevated anxiety. Having a medical condition was associated with reduced social QOL. Finally, having children was associated with increased psychological QOL.

Discussion

We presented preliminary findings from a survey conducted during the acute and initial phase of the COVID-19 pandemic in Israel. As noted, social restrictions were declared very early in Israel and were upheld very tightly by the government for nearly two months. Our results present a mixed picture regarding the public's well-being. On one hand, the moderate-to-high levels of general stress and worry are congruent with the general uncertainty, and with the message sent by the harsh restrictions, implying that the crisis is very serious. However, anxiety levels were low and may be attributed to the relative resilience of Israeli society. Many Israelis have undergone wars and ongoing political violence for decades and may therefore be accustomed to coping with stress.

Importantly, our findings highlight the detrimental role of loneliness during the COVID-19 crisis. Loneliness, often considered an 'epidemic' (King, 2018), is associated with adverse psychological and physical outcomes (Jaremka *et al.*, 2013). Its effects are amplified in the current crisis, which is characterized by social distancing. Those experiencing loneliness may feel detached from sources of support, or lack the potentially protective sense of common fate with the rest of society and humanity (Akin, 2010).

Interestingly, older age was a protective factor, although the elderly are constantly being identified as a high-risked population. This may be attributed to their richer life experience (Ardelt *et al.*, 2013) and a possible reduced fear of illness and death (e.g., Fortner *et al.*, 2000). Women's increased psychological vulnerability found here is in line with numerous other studies (Girgus & Yang, 2015). There are multiple explanations for gender differences in stress-related disorders (e.g., Pineles *et al.*, 2017), including an increased tendency for 'monitoring' (i.e., looking out for signs of/information about the stressor), which may account for increased threat perception and subsequent distress (Muris & De Jong, 1993).

Finally, having a pre-existing health condition was associated with distress. This may have to do with both objective (i.e., COVID-19 is dangerous for those with existing illness) and subjective (i.e., increased sense of vulnerability, fuelled by media) factors. While this fear is somewhat justified, it nonetheless calls for more balanced and responsible media coverage and public health policy.

Study limitations include self-report measures and a cross-sectional design. In addition, this study was based on a modest sample size, with a gender imbalance. Thus, our findings should be viewed with some caution, as they are preliminary in nature. Nonetheless, these findings may be of particular importance, as they are based on a peri-crisis survey, conducted under unique psychological circumstances. There is an urgent need for further studies, with more advanced designs (e.g., longitudinal), and larger, more carefully recruited, samples. Based on our preliminary findings, attention should be given to people showing a combination of risk factors, including younger age, female gender, and having a pre-existing illness, thereby assisting them in coping with the pandemic. Specifically, feelings of loneliness and factors associated with being alone (being single, no children) can and should be the focus of mental health interventions in the midst of this health crisis. Early interventions are also important, in order to prevent mental distress in this ongoing crisis.

Authors' contribution

Danny Horesh, PhD (Conceptualization; Methodology; Project administration; Writing – original draft). Rony Kapel Lev-Ari (Data curation; Formal analysis; Methodology). Ilanit Hasson-Ohayon (Conceptualization; Methodology; Writing – original draft).

Conflicts of interest

All authors declare no conflict of interest.

References

- Akin, A. (2010). Self-compassion and Loneliness. *International Online Journal of Educational Sciences*, 2(3), 702–718.
- Ardelt, M., Landes, S. D., Gerlach, K. R., & Fox, L. P. (2013). Rediscovering internal strengths of the aged: The beneficial impact of wisdom, mastery, purpose in life, and spirituality on aging well. In J. D. Sinnott (Ed.), *Positive psychology: Advances in understanding adult motivation* (pp. 97–119). New-York: Springer Science + Business Media.
- Beck, A. T., Epstein, N., Brown, G., & Steer, R. A. (1988). An inventory for measuring clinical anxiety: Psychometric properties. *Journal of Consulting and Clinical Psychology*, 56, 893–897.
- Brooks, S. K., Webster, R. K., Smith, L. E., Woodland, L., Wessely, S., Greenberg, N., & Rubin, G. J. (2020). The psychological impact of quarantine and how to reduce it: rapid review of the evidence. *The Lancet*, 395(10227), 912–920. [https://doi.org/10.1016/S0140-6736\(20\)30460-8](https://doi.org/10.1016/S0140-6736(20)30460-8)
- Cao, W., Fang, Z., Hou, G., Han, M., Xu, X., Dong, J., & Zheng, J. (2020). The psychological impact of the COVID-19 epidemic on college students in China. *Psychiatry Research*, 287, 112934.
- Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior*, 24, 386–396.
- Fortner, B. V., Neimeyer, R. A., & Rybarczyk, B. (2000). Correlates of death anxiety in older adults: A comprehensive review. In A. Tomer (Ed.), *Death attitudes and the older adult: Theories, concepts, and applications* (pp. 95–108). Philadelphia, PA: Taylor & Francis.
- Girgus, J. S., & Yang, K. (2015). Gender and depression. *Current Opinion in Psychology*, 4, 53–60.
- Huang, J. Z., Han, M. F., Luo, T. D., Ren, A. K., & Zhou, X. P. (2020). Mental health survey of 230 medical staff in a tertiary infectious disease hospital for COVID-19. *Chinese Journal of Industrial Hygiene and Occupational Diseases*, 38, E001.
- Jaremka, L. M., Fagundes, C. P., Glaser, R., Bennett, J. M., Malarkey, W. B., & Kiecolt-Glaser, J. K. (2013). Loneliness predicts pain, depression, and fatigue: understanding the role of immune dysregulation. *Psychoneuroendocrinology*, 38(8), 1310–1317.
- King, M. (2018). Working to address the loneliness epidemic: perspective-taking, presence, and self-disclosure. *American Journal of Health Promotion*, 32(5), 1315–1317.
- Kuwabara, H., Shioiri, T., Toyabe, S. I., Kawamura, T., Koizumi, M., Ito-Sawamura, M., . . . Someya, T. (2008). Factors impacting on psychological distress and recovery after the 2004 Niigata-Chuetsu earthquake, Japan: Community-based study. *Psychiatry and Clinical Neurosciences*, 62(5), 503–507.
- Lauri Korajlija, Anita, & Jokic-Begic, Natasa (2020). COVID-19: Concerns and behaviours in Croatia. *British Journal of Health Psychology*. <https://doi.org/10.1111/bjhp.12425>
- Li, W., Yang, Y., Liu, Z. H., Zhao, Y. J., Zhang, Q., Zhang, L., . . . Xiang, Y. T. (2020). Progression of Mental Health Services during the COVID-19 Outbreak in China. *International Journal of Biological Sciences*, 16(10), 1732–1738.
- Muris, P., & De Jong, P. (1993). Monitoring and perception of threat. *Personality and Individual Differences*, 15(4), 467–470.
- Person, C., Tracy, M., & Galea, S. (2006). Risk factors for depression after a disaster. *The Journal of Nervous and Mental Disease*, 194(9), 659–666.

- Pineles, S. L., Hall, K. A. A., & Rasmusson, A. M. (2017). Gender and PTSD: different pathways to a similar phenotype. *Current Opinion in Psychology, 14*, 44–48.
- Qiu, J., Shen, B., Zhao, M., Wang, Z., Xie, B., & Xu, Y. (2020). A nationwide survey of psychological distress among Chinese people in the COVID-19 epidemic: implications and policy recommendations. *General Psychiatry, 33*(2), e100213. <https://doi.org/10.1136/gpsych-2020-100213>
- Roy, D., Tripathy, S., Kar, S. K., Sharma, N., Verma, S. K., & Kaushal, V. (2020). Study of knowledge, attitude, anxiety & perceived mental healthcare need in Indian population during COVID-19 pandemic. *Asian Journal of Psychiatry, 10*2083.
- Taha, S., Matheson, K., Cronin, T., & Anisman, H. (2014). Intolerance of uncertainty, appraisals, coping, and anxiety: The case of the 2009 H 1 N 1 pandemic. *British Journal of Health Psychology, 19*(3), 592–605.
- Taylor, M. R., Agho, K. E., Stevens, G. J., & Raphael, B. (2008). Factors influencing psychological distress during a disease epidemic: Data from Australia's first outbreak of equine influenza. *BMC Public Health, 8*(1), 347.
- The WHOQOL Group (1998). Development of the World Health Organization WHOQOL-BREF quality of life assessment. *Psychological Medicine, 28*(3), 551–558.

Received 7 April 2020; revised version received 15 June 2020

Supporting Information

The following supporting information may be found in the online edition of the article:

Table S1. Hierarchical regressions: correlates of psychological QOL.

Table S2. Hierarchical regressions: correlates of Social QOL and environmental QOL.