


Who is the Most Stressed During the COVID-19 Pandemic? Data From 26 Countries and Areas

Marta Kowal*  and Maciej Karwowski



University of Wrocław, Wrocław, Poland

Tao Coll-Martín

University of Granada, Granada, Spain

Gözde Ikizer

TOBB University of Economics and Technology, Ankara, Turkey

Jesper Rasmussen  and Andreas Lieberoth 

Aarhus University, Aarhus, Denmark

Kristina Eichel

Brown University, Providence, RI, USA

Anna Studzińska

University of Economics and Human Sciences in Warsaw, Warsaw, Poland

Karolina Koszałkowska

University of Lodz, Lodz, Poland

Arooj Najmussaib

Bahria University, Islamabad, Pakistan

Daniel Pankowski 

University of Economics and Human Sciences in Warsaw, Warsaw, Poland

University of Warsaw, Warsaw, Poland

Oli Ahmed 

University of Chittagong, Chittagong, Bangladesh

*Address for correspondence: Marta Kowal, Dawida 1, 50-529 Wrocław, Poland. Email: mar-ta7kowal@gmail.com

Background: To limit the rapid spread of COVID-19, countries have asked their citizens to stay at home. As a result, demographic and cultural factors related to home life have become especially relevant to predict population well-being during isolation. This pre-registered worldwide study analyses the relationship between the number of adults and children in a household, marital status, age, gender, education level, COVID-19 severity, individualism–collectivism, and perceived stress. **Methods:** We used the COVIDiSTRESS Global Survey data of 53,524 online participants from 26 countries and areas. The data were collected between 30 March and 6 April 2020. **Results:** Higher levels of stress were associated with younger age, being a woman, lower level of education, being single, staying with more children, and living in a country or area with a more severe COVID-19 situation. **Conclusions:** The COVID-19 pandemic revealed that certain people may be more susceptible to experience elevated levels of stress. Our findings highlight the need for public health to be attentive to both the physical and the psychological well-being of these groups.

Keywords: COVID-19, cross-cultural, demographic characteristics, quarantine, stress, well-being

INTRODUCTION

The COVID-19 pandemic brought the world to a halt. Since early 2020, social life has changed for many people around the world. Government restrictions and new social norms led to a reduction in mobility (Google, 2020), avoidance of public transport, cancellation of the majority of large events such as concerts, festivals, religious and sports events, and the temporary closing down of meeting places such as cafes, restaurants, museums or theatres. The COVID-19 outbreak and measures undertaken by almost all the countries around the world pose numerous threats to people's psychological well-being; thus, we believe that focusing on our closest social environment is greatly needed. Both relative lack of social relations (Tay et al., 2013) and negative emotions (Huppert, 2009) strongly predict overall mortality and disease outcomes, and the threat of SARS-CoV-2 may increase anxiety levels (Karwowski et al., 2020) and prejudice toward other nationalities (Sorokowski et al., 2020), rendering any effort to understand stress in isolated or quarantined individuals during the COVID-19 pandemic even more important. Moreover, to understand possible negative effects, it is important to unpick the pre-existing factors that can predict the stress levels of people in quarantine or isolation.

Other People

One such factor is the presence (or absence) of other people. To date, most of the existing studies on human isolation and confinement are naturalistic observational studies, such as the SEALAB project (Radloff & Helmreich, 1968), or the

South African National Research station (SANAE) in Antarctica (Vermeulen, 1977). Under these difficult circumstances of a physically and socially restricted environment, participants reported high indices of severe hostility, depression, insomnia, and anxiety. Studies on prisoner populations suggest that social factors can significantly boost prisoner's well-being, which can otherwise be disrupted by jail isolation (Kyprianides & Easterbrook, 2020). The conditions in which participants of the aforementioned studies were put are far from what people are experiencing now. Although being relatively isolated from the outside world, many of us remain within the comfort of our own homes, usually surrounded by friends or relatives. However, there are also people who are getting through this time alone. Living alone has been previously linked to higher indices of depression and anxiety, and other common mental disorders (Jacob et al., 2019). Therefore, those who live alone might experience more stress due to the COVID-19 situation than those living with people who may be a source of potential support (Cohen & Wills, 1985). On the other hand, being around others might be stress-enhancing. Specifically, the company of others can be detrimental to mental health when one is subjected to overcrowding—or, in the current situation—residential or household crowding, highly prevalent in developing countries (Epstein, 1981). Studies suggest that this type of chronic stress is often accompanied by a lack of privacy, a higher number of unwanted social interactions, possible deterioration of relationships with the family or flatmates, and so forth (Fuller et al., 1996). Considering the above, we hypothesise that the relationship between the number of people one is stuck with during isolation is somewhat U-shaped—those who live alone and those who are subjected to overcrowding experience the highest levels of stress.

Intimate Relationships

In general, married individuals are happier (Lee & Ono, 2012), live longer and healthier lives (Kiecolt-Glaser & Newton, 2001), and are at a lower risk of committing suicide (Waite & Gallagher, 2001). A recent study by Chin et al. (2017) supported previous conclusions at a physiological level. Interestingly, the authors investigated the cortisol levels (a hormone that is often associated with stress) of married and single persons, and found that married individuals had lower cortisol levels than unmarried and previously married people, which would suggest that they experience lower levels of stress. Similar patterns have been observed among persons in intimate relationships (not necessarily married), who exhibited lower levels of stress compared with single persons when stress was assessed by blood pressure (Sisca, 1985), self-reported measures (Hudson & O'Regan, 1994), or a broad range of well-being indices (Sorokowski et al., 2019).

Despite numerous advantages, being in a romantic relationship also carries a number of risks, for instance, contagion of negative emotions (Roberts &

Levenson, 2001). Moreover, when couples encounter difficulties, such as financial hardship, or a lack of support from the spouse, they may experience a pronounced decrease in marital satisfaction, which can lead to an increase in stress levels (Archuleta et al., 2011).

On the other hand, intimate relationships allow for dyadic coping (for a review, see Bodenmann, 2005), and often serve as a buffer against difficult situations (Gottlieb & Wagner, 1991), which may in turn translate into lower levels of stress (Chin et al., 2017). Here, we intend to investigate whether marital status is a significant predictor of stress levels during quarantine or isolation on a large dataset from numerous countries around the world. We hypothesise that during the difficult times of relative isolation, being in an intimate relationship (i.e. marriage or cohabitation) is more beneficial in terms of experienced stress levels than being single.

Number of Children

Also of interest is how having and living with children relates to the experiences of adults during the period of relative isolation. Having children is quite a positive experience, as it has been generally related to greater life satisfaction, especially amongst married couples in contrast to individuals who are separated, cohabiting or never-married singles (Angeles, 2010). Nevertheless, having children may also foster elevated stress levels. Parental stress is the result of the gap between the challenges of being a parent and the parent's perceived ability to cope with those challenges (Abidin, 1995). This kind of stress may be even more pronounced during the COVID-19 outbreak, as most parents now must home-school their children. Parental stress has been associated with numerous negative feelings and thoughts, such as feeling overwhelmed and dissatisfied, and also perceiving the child as difficult (Haskett et al., 2006). For instance, a study on parents from 94 countries showed that parenthood is negatively linked to well-being (Stanca, 2012).

As outbreaks make individuals vulnerable to depression and diminished social support (Stein et al., 2005), the current COVID-19 pandemic may compromise parenting and childcare practices. Concerns over a child younger than 16 years getting COVID-19 have been reported as very common among parents in China (Wang et al., 2020). During the equine influenza outbreak in Australia, Taylor et al. (2008) found that individuals having one child had a 1.2 times higher risk of experiencing distress than those with no children. Therefore, we hypothesise that having children at home may be associated with higher levels of stress in adults.

Gender

Gender seems to be related to well-being (Mroczek & Kolarz, 1998) and stress levels (Taylor et al., 2008). Previous studies have found that women report greater sadness, anxiety, and stress than men (Bergdahl & Bergdahl, 2002; Gao et al., 2019).

Concerning quarantine, evidence from the first outbreak of equine influenza in Australia showed no gender differences on the level of psychological distress (Taylor et al., 2008). However, a recent study by Limcaoco et al. (2020) in 25 countries on susceptibility to stress during the COVID-19 situation indicated that women report greater levels of stress. Similar gender differences for stress, anxiety, and depression symptoms were found by Wang et al. (2020) in a Chinese sample during the initial stage of the COVID-19 outbreak, although only a minority of the participants reported being confined. In sum, while the evidence suggests that women in normal circumstances experience more stress, support for the link between gender and stress under quarantine is inconclusive.

Age

Generally, stress levels tend to decrease with age and although older adults report poorer perceived health, they have lower stress levels and higher well-being than young adults (Archer et al., 2015). Bergdahl and Bergdahl (2002) found that self-reported stress levels increase from the age of 20 to a peak in the 40s, and then decrease to the lowest level in the 60s. Stone et al. (2010) argued that well-being increases after 50 years of age, proposing an inverted U-shaped relationship between age and well-being (but see Frackowiak et al., 2020). Studies generally support the notion that older people are less affected by stressors than younger people (Feizi et al., 2012).

Few studies have investigated the relationship between age and stress levels during quarantine. The objective consequences of being infected by SARS-CoV-2 are higher for the older population (World Health Organization, 2020a, 2020b). However, while the perceptions of a highly transmitted illness threat among the elderly may prompt stress, the empirical evidence is mixed. For instance, Taylor et al. (2008) found that the negative psychological impact of quarantine is more pronounced among younger people. Investigating psychosocial responses towards a national outbreak of SARS in Singapore, Sim et al. (2010) found that psychiatric morbidities are associated with younger age and higher posttraumatic stress symptoms. Most recently, an online survey in the early stages of the COVID-19 outbreak in China found no association between age and stress (Wang et al., 2020).

As such, although older adults face higher risks of severe disease and death due to COVID-19 (WHO, 2020b), the evidence suggests that older

people are less stressed and less affected by psychological consequences of quarantine and social isolation, while younger ones exhibit the highest levels of stress.

Individualism–Collectivism Dimension

The role of culture has been widely studied for decades, with researchers debating how cultural factors may act as a buffer to the environmental stressors or, on the contrary, exacerbate stress levels (Dar, 2017). One of the main focuses of research in this area, the individualism–collectivism dimension (Hofstede, 2001), has been linked to stress processing (Chun et al., 2006). During the current quarantine, people have been forced to renounce their personal enjoyment (e.g. sports, concerts, shopping, travel, social gatherings) for the sake of group needs. Since individualistic, rather than collectivistic, cultures put a higher value on pleasure and hedonism (Schwartz, 2009), it might be reasonable to think that the emotional cost of this quarantine period would be greater in individualistic cultures. In fact, collectivistic (vs. individualistic) cultures put more emphasis on group harmony over personal interests and enjoyment (Triandis et al., 1990). Moreover, Oarga et al. (2015) found that helping behaviours had a stronger association with life satisfaction in countries where helping others constituted a social norm. In this sense, people from collective cultures would be likely to focus on caring for others, thereby alleviating the negative psychological consequences of quarantine. Overall, under the prevailing quarantine, the level of stress is expected to be higher for individualistic cultures compared to the collectivistic ones.

Aims and Hypotheses

The present study is one of the first to test how the number of persons an individual is staying with in isolation, along with age, gender, marital status, the number of children, and culture (i.e. individualism vs. collectivism) is associated with experienced stress levels in a large sample from 27 countries and areas. Furthermore, we want to investigate the link between stress levels and educational background and the severity of the COVID-19 situation in each country or area. Based on the literature review, our pre-registered hypotheses (see <https://osf.io/xf4mj>) were as follows:

H1: Individuals living alone and those who are subjected to overcrowding while in isolation experience the highest levels of perceived stress (compared with individuals living with others).

H2: Married and cohabiting persons experience lower levels of stress compared with persons that are single.

H3: Individuals with children would report increased stress levels during the COVID-19 pandemic compared to people living alone or with adults. Levels of perceived stress would increase as the number of children at home increases.

H4: Younger people experience more stress than older people.

H5: People in collectivistic cultures experience less stress than those in individualistic cultures.

H6: Women experience higher levels of stress compared with men (not pre-registered hypothesis).

METHODS

Participants

Participants were volunteers, recruited online between 30 March and 6 April 2020, using a snowballing technique. The initial sample included 54,245 Internet users from 27 countries and areas who participated in the COVIDiSTRESS study. However, based on the reliability analysis, we decided to exclude one country (Kosovo). The final sample consisted of 53,524 participants from 26 countries and areas (see the Results section for more details). Participation was not remunerated. The numbers for each country with their respective individualism scores (based on the Hofstede index; Hofstede, 2001; Hofstede et al., 2010), along with detailed descriptions of all participants from each country are presented in the Supplementary Material, Table S1 (<https://osf.io/cznr8/>). As stated in the pre-registration, we only included countries and areas with $N > 300$ participants.

This sample consisted of 34,475 women (64.6%), 18,288 men (34.2%) and 645 people who responded with “other/would rather not say” (1.2%). The age in the sample ranged between 18 and 110 years ($M = 38.17$, $SD = 13.79$). The sample included 26,429 married or cohabiting participants (49.4%), 20,465 singles (38.2%), 3,626 divorced or widowed (6.8%), and 3,004 people who would rather not answer (5.6%); 629 individuals did not attain any education (1.2%), 709 completed 6 years of school (1.3%), 741 completed 9 years of school (1.4%), 5,133 completed 12 years of school (9.6%), 11,639 completed some college, short continuing education or equivalent (21.8%), 28,983 attained a college degree, bachelor, or masters (54.3%), and 5,497 obtained a PhD/doctorate (10.3%); 24,367 participants indicated that they are isolated (45.8%), 62—isolated in medical facility or similar location (0.1%), 25,867—life carries on with minor changes (48.7%), and 2,862—life carries on as usual (5.4%) (see Supplementary Material for participants’ detailed descriptives across countries and areas).

Measures and Procedure

Both the collaborating researchers of the COVIDiSTRESS project and the participants shared the invitation to participate in the study through various online channels (e.g. social media and private communication). The questionnaire was administered via Qualtrics. Information on all the components of the survey can be found in the COVIDiSTRESS Global Survey Research Network (2020), while in this paper, we report only the measures relevant to the analyses conducted.

The levels of perceived stress were measured with the widely used Perceived Stress Scale (PSS; Cohen et al., 1983; Cohen & Williamson, 1988). It includes 10 items (four reverse-scored) concerning various subjective feelings related to problems, behaviours, and ways of coping, on a 5-point scale from 0 (never) to 4 (very often). Cronbach's alphas for each of the language versions of the scale are presented in the Supplementary Material (<https://osf.io/cznr8/>).

Statistical Analyses

A detailed description of the cleaning process of the database can be found in the Supplementary Material. Furthermore, we transformed the continuous variables of interest that violated the normal distribution (i.e. the number of adults, dependants, children, and a measure of COVID-19 severity), by square rooting them.¹

We began our analyses by testing the cross-cultural equivalence of the PSS-10. To this end, in a multi-group factor analysis in R (R Core Team, 2014), using the following packages: lavaan (Rosseel, 2012), and semTools (Jorgensen et al., 2019), we compared the models assuming a two-factor structure (positive and negative, with the latter consisting of reversed items; Roberti et al., 2006) across 26 countries and areas (configural invariance), with a model with factor loadings and latent correlations constrained to be equal (metric invariance), and items' intercepts to be the same in all groups (scalar invariance). When evaluating the model fit, we relied on the usually applied criteria (Hu & Bentler, 1999), in which a comparative fit index (CFI) and Tucker Lewis Index (TLI) above .90 indicate adequate fit, whereas a root-mean-square error of approximation (RMSEA) below .08 and a standardised root-mean-square residual (SRMR) below .06 indicates no misfit. When evaluating measurement equivalence, we compared the configural invariance model with the metric invariance model, and then the metric invariance model with the scalar invariance model. As these models were characterised by a growing complexity (each subsequent model was nested within the previous one), while assessing models' superiority we relied on the cut-off criteria recommended for testing measurement invariance: a

¹ As a robustness check, in a separate model, we have also included these variables in a raw form: the results remained almost the same.

change of *CFI* (ΔCFI) less than .01 ($\Delta CFI < .01$), a change of *RMSEA* of less than .015 ($\Delta RMSEA < .015$), and a change of *SRMR* less than .01 ($\Delta SRMR < .01$) would indicate that the two models compared do not differ in terms of model fit (Chen et al., 2008; Cheung & Rensvold, 2002).

After computing Cronbach's alpha for the PSS-10 for all the countries and areas separately and jointly, we tested multilevel regression models, using Jamovi (Version 1.2.16.). In these models, participants were nested within countries, and the number of adults, children, marital status, education level, and gender were group-mean-standardised. In the first model, we regressed a composite score of perceived stress levels on the number of adults and the number of children, as well as participants' gender, age, marital status, education level, COVID-19 severity (the number of confirmed cases at the time of data collection (World Health Organization, 2020a, 2020b), divided by the number of the country's citizens (Worldometer, 2020; Level-2 variable), and culture (i.e. collectivistic vs. individualistic: Level-2 variable). The first model we created included a random intercept of stress on a country level. The second model differed, as we additionally estimated random slopes of the number of children. The third model tested for potential curvilinear links by adding two variables in a squared form (i.e. the number of adults and children). The final, fourth model included random intercept for the stress level as well as all random slopes for age, gender, and marital status.

RESULTS

The PSS-10 was found to be highly reliable (overall Cronbach's alpha: .869), with the exception of Kosovo (Cronbach's alpha: .688). Confirmatory factor analysis indicated that the overall model fit the data well in the case of configural invariance ($CFI = .996$, $TLI = .995$, $SRMR = .028$, $RMSEA = .028$), but not metric invariance ($CFI = .986$, $TLI = .985$, $SRMR = .044$, $RMSEA = .046$). Based on the poor reliability of Kosovo, we decided to exclude data from this country and re-estimated the multi-group CFA model. After excluding data from Kosovo, the model slightly improved: configural ($CFI = .996$, $TLI = .995$, $SRMR = .028$, $RMSEA = .028$), metric ($CFI = .987$, $TLI = .996$, $SRMR = .043$, $RMSEA = .044$), and scalar invariance ($CFI = .950$, $TLI = .955$, $SRMR = .073$, $RMSEA = .081$). However, as the scalar invariance was not reached (a change in fit model indices was above recommended criteria, i.e. ΔCFI and $\Delta SRMR > .01$), in the next step, we tested for a partial scalar invariance (Byrne et al., 1989; Steenkamp & Baumgartner, 1998). The final model fit the data well, and partial scalar invariance was reached ($CFI = .983$, $TLI = .983$, $SRMR = .047$, $RMSEA = .050$). Table 1 depicts mean stress levels across countries, and Table 2 presents correlations across variables of interest. The mean stress level in the present study in, for instance, the USA ($M = 17.50$) was significantly higher than the mean stress level ($M = 13.19$) indicated by the PSS-10 norms (Cohen et al., 1994; 13.19), $t(3896) = 19.45$, $p < .001$, $d = 0.63$.

TABLE 1
Mean Levels of Perceived Stress Across Countries and Areas

Country	Number of participants	Mean stress level (SD)	Country	Number of participants	Mean stress level (SD)
Argentina	2286	17.53 (7.38)	Indonesia	938	18.00 (5.75)
Belgium	339	16.38 (7.27)	Italy	525	16.04 (6.89)
Bosnia and Herzegovina	660	18.95 (6.73)	Japan	3190	20.08 (5.74)
Bulgaria	2413	18.78 (7.10)	Lithuania	4450	15.32 (6.88)
Canada	307	17.81 (6.66)	Mexico	5781	17.33 (7.32)
Croatia	900	19.55 (6.75)	Poland	2094	20.19 (7.28)
Czech Republic	461	17.54 (6.95)	Portugal	425	18.81 (7.25)
Denmark	5200	14.22 (7.21)	Spain	363	16.80 (7.19)
Finland	7464	14.85 (7.50)	Switzerland	719	13.93 (6.66)
France	9395	15.71 (7.38)	Taiwan	869	15.97 (6.85)
Germany	616	16.52 (6.87)	Turkey	683	21.71 (6.67)
Greece	304	17.43 (6.41)	United Kingdom	886	17.53 (7.50)
Hungary	745	17.60 (6.06)	United States	1511	17.50 (7.36)

Note: Mean stress scores on 10 items on a 5-point Likert scale, ranging from 0 – almost never, to 4 – always.

TABLE 2
Correlation Matrix on Main Variables of Interest

	1	2	3	4	5	6	7
1. Perceived stress	—						
2. Gender	.09***	—					
3. Age	-.24***	.04***	—				
4. Adults ^a	.06***	-.04***	-.14***	—			
5. Children ^b	.04***	.06***	-.03***	.14***	—		
6. People ^c	.07***	.00	-.13***	.90***	.56***	—	
7. Dependents ^d	-.02***	.06***	.20***	.08***	.53***	.31***	—
8. Education ^e	-.04***	-.03***	-.01	-.01**	.03***	.00	.03***

Note: ^aAdults—the number of adults staying with the participants during the relative isolation. ^bChildren—the number of children staying with the participants during the relative isolation. ^cPeople—the number of people staying with the participants during the relative isolation. ^dDependents—the number of dependants staying with the participants during the relative isolation. ^eEducation—education status, with a higher number representing a higher completed education level. * $p < .05$; ** $p < .01$; *** $p < .001$.

Having established configural, metric, and partly scalar invariance, we proceeded with multilevel models to examine whether the number of people (adults and children) our participants were staying with during the pandemic was associated with their perceived stress level, controlling for gender, age, education level, marital status, scores on the individualism measure, and COVID-19 severity. Taking into consideration the four models we described in the Statistical Analyses section, based on the Bayesian Information Criterion, the fourth model (with random effects for both slopes and intercepts) showed a superior fit when compared to the others (i.e. $\Delta BIC > 10$; Raftery, 1999; Δ between the first and the fourth model $BIC = 432$, the second and fourth $\Delta BIC = 431$, the third and fourth $\Delta BIC = 450$). The model that included the squared number of adults and children surrounding the participants in their isolation had substantially worse fit than the second model ($\Delta BIC = -19$); thus, we infer that there is a linear rather than a curvilinear relationship between the number of adults and children, and stress.

As illustrated in Table 3, younger people perceived higher levels of stress compared with older people ($\beta = -0.076$, $SE = 0.016$, $p < .001$); the number of children an individual was staying with was positively related to perceived stress levels ($\beta = 0.021$, $SE = 0.003$, $p < .001$); women were more stressed than men ($\beta = 0.065$, $SE = 0.012$, $p < .001$); married or cohabiting people were less stressed than singles ($\beta = -0.132$, $SE = 0.048$, $p < .01$); education was negatively related to stress levels ($\beta = -0.022$, $SE = 0.003$, $p < .001$), meaning that the higher the completed education, the less stressed a participant was, and participants from countries and areas with higher COVID-19 severity were more stressed ($\beta = 0.090$, $SE = 0.044$, $p < .05$). The countries' and areas' score on the individualism–collectivism continuum was not related to perceived stress ($\beta = -0.087$, $SE = 0.045$, $p = .063$), and similarly the number of adults the participant was staying with ($\beta = 0.001$, $SE = 0.003$, $p = .806$).

DISCUSSION

The results of the present study, based on analyses of data from 53,524 respondents from 26 countries and areas, provide evidence that higher levels of stress are reported by women, single people, people of younger age, people staying with more children, the less educated, and from countries and areas with a more severe COVID-19 situation. The level of the country's individualism and the number of adults the individual was staying with were not related to stress levels. What is worth highlighting is that the variable which was the most strongly associated with stress levels was marital status, while the standardised coefficients of other variables showed very small effect sizes. Moreover, the analysis of random effects revealed that countries and areas differed in both stress levels and the association between stress levels and marital status, gender, and age. Such differences and their underlying mechanisms warrant further investigations.

TABLE 3
Results of a Multilevel Model, with Participants Nested within Countries and Areas, and Random Effects for Both Intercepts and Slopes for Age, Gender, and Marital Status

<i>Fixed effects</i>	β	<i>SE</i>	<i>p</i>
Culture ^a	-0.087	0.045	.063
Age	-0.076	0.016	<.001
Adults ^b	0.000	0.003	.806
Children ^c	0.021	0.003	<.001
Gender (Men vs. Women)	0.065	0.012	<.001
Education ^d	-0.022	0.003	<.001
COVID-19 severity ^e	0.090	0.044	.050
Marital status (Single vs. Married) ^f	-0.132	0.048	.006
<i>Random effects^g</i>	<i>SD</i>	<i>LRT</i>	<i>p</i>
Age	0.077	816.83	<.001
Gender (Men vs. Women)	0.054	366.59	<.001
Marital status (Married vs. Single) ^f	0.238	368.13	<.001

Note: ^aCulture–Hofstede’s score of a country’s individualism (i.e. the higher the number, the more individualistic the country). ^bAdults–the number of adults staying with the participants during the relative isolation. ^cChildren–the number of children staying with the participants during the relative isolation. ^dEducation–education status, with a higher number representing a higher completed education level: 6–PhD/Doctorate; 5–College degree, bachelor, master; 4–Some College, short continuing education or equivalent; 3–Up to 12 years of school; 2–Up to 9 years of school; 1–Up to 6 years of school; 0–None. ^eCOVID-19 severity–the number of confirmed cases divided by the number of countries’ citizens. ^fMarital status–single individuals are coded as 0, and married or cohabiting individuals as 1. ^gRandom effects–the likelihood ratio test for each random effect, representing variability of stress levels and the association between stress levels and other variables of interest between countries. For the intercept: *SD* = 0.261, *ICC* = 0.130. Significant results are bolded.

H1. The Number of People Together—Do People Living Alone Experience the Highest Level of Stress? No

Even though almost half of our sample was stuck at home (46.1%), while 20.2 per cent lived alone, and 77.5 per cent stayed with one or more adults, we found very little evidence for the association between the number of adults and perceived stress levels (beyond marital status). The results of our study contradict previous findings, which suggested that either living alone or having too many people around can negatively affect one’s well-being (Fuller et al., 1996). It is possible that living alone may be a preference for many people in our sample, and that they are able to provide for themselves and to pay the rent for a single apartment. Many of those who live alone still maintain high levels of connections with their non-household relatives or friends (De Vaus & Qu, 2015). Previous studies have shown that people use social media to connect with others (Kowal et al., 2020), and these valuable (and, most importantly, intentional) connections and interactions are not hindered by the current situation, as they can be kept online.

H2. Marital Status—Do Single People Experience More Stress Than Married People? Yes

The results of our study provided support to our hypothesis that married (or cohabiting) individuals experience lower levels of stress than single individuals. These findings fall in line with previous studies highlighting the benefits of being in an intimate relationship (e.g. Braithwaite et al., 2010). Dyadic coping can make up for the potential shortcomings of being in a relationship, and overall, provide more benefits than harm (Merz et al., 2014). Such a protective role may be even more pronounced during difficult times, for instance during financial hardship (Helms et al., 2014). Within the COVID-19 context, our findings are in line with those of Odriozola-González et al. (2020), who provided evidence that single (as compared with married) individuals score higher on measures of anxiety, depression, and stress.

On the other hand, our results differ from Wang et al. (2020) and Tian et al. (2020), who found no differences related to marital status on perceived stress, and higher levels of distress among single (vs. married) Chinese citizens, respectively. However, the sample analysed by Wang et al. (2020) may have been underpowered to detect the effect of being in a relationship, as it had 1,210 participants, and tested numerous relationships between various variables. Moreover, Tian et al. (2020) did not control for other relevant factors that could have accounted for the differences (e.g. age, gender). Our study used a high-powered sample from different countries and areas as well as multivariate analysis techniques to control for several confoundings.

H3. Children—Do People with Children Experience More Stress? Yes

Our data confirm the hypothesis that individuals with children report increased stress levels during the COVID-19 pandemic compared with people living alone or with adults. Moreover, the levels of perceived stress increased with the growing number of children at home. The presence of children during relative isolation or quarantine, probably due to increased home strain and need for childcare, might put demands on adults living with them. In addition, concerns over a child being sick with COVID-19 have been previously shown to be associated with greater severity of stress and anxiety symptoms in parents (Wang et al., 2020). Having children has also been associated with decreased financial satisfaction (Stanca, 2012). Future studies should examine whether the ages or gender of children living at home moderate the relationship between the number of children and adults' stress levels.

H4. Age—Do Younger People Experience More Stress than Older People? Yes

The results of our study provided evidence for a negative linear relationship between age and stress levels—younger people experience more stress than older people—contrasting with the existing literature suggesting an inverted U-shaped relationship between age and stress (Stone et al., 2010). The findings of the present study are in contrast with a recent study of the COVID-19 outbreak, which showed no association between age and stress levels in a Chinese sample (Wang et al., 2020). Rather, our results support the findings of Limcaoco (2020), who, in a sample of people in quarantine across 41 countries, found age to be significantly related to stress levels. Our evidence warns that we cannot neglect the mental health condition of the younger generations as they seem to be the most stressed during the COVID-19 outbreak.

H5. Culture—Do People from Individualistic Cultures Experience More Stress? No

In contrast to our hypothesis that people from individualistic cultures might experience more stress than those from collectivistic cultures, we observed no differences in perceived stress levels between countries with varying levels of individualism. Collectivism demands that people feel the obligation and responsibility towards in-group members. Therefore, due to living in traditional families (Persike & Seiffge-Krenke, 2012) and feeling more guilt and remorse for seeking help (Kim et al., 2008), people from collectivistic cultures may feel more stressed over their financial burdens than people from individualistic cultures, whereas people from individualistic cultures may treat the current situation as a threat to their need for self-expression and freedom (Kim & Sherman, 2007) which translates into equal levels of stress.

H6. Gender—Do Women Experience More Stress than Men? Yes

Our data provide evidence that women experience significantly higher stress levels than men during quarantine. These findings support the existing literature on the relationship between gender and stress levels (e.g. Bergdahl & Bergdahl, 2002; Stone et al., 2010), but are contradictory to recent studies on the COVID-19 outbreak, which found gender to be unrelated to stress levels (Li et al., 2020; Limcaoco et al., 2020; Wang et al., 2020). However, conclusions from these studies ought to be drawn with caution, as they either focused exclusively on samples within one country (e.g. Wang et al., 2020) or included a small number of participants (e.g. Limcaoco et al., 2020). Women are found to be more family-oriented and provide a supportive role (Tigani et al., 2011); however, during

this highly unprecedented time of quarantine, they are overwhelmed by the need to support their families, and such a commitment is beyond their coping capabilities. Moreover, during the relative isolation, it is women who are more likely to not only take care of their work responsibilities, but also take care of the children and home (Minello, 2020).

Limitations

Although the present study contributes to a better understanding of the relationship between the presence of others and perceived stress during the COVID-19 pandemic, it is not without limitations. First, in order to reach out to participants that are currently under lockdown, it was necessary to use self-reports and to make use of the individuals' internet access, although it might limit our findings to a population that is wealthier and has a higher educational background than the general population. Moreover, perceived stress level was tested using only a single self-reported measure (10-item Perceived Stress Scale), which warrants some caution. Future studies should also include other measures of stress to expand our knowledge of various aspects of well-being during the pandemic.

Second, it would not have been possible to use an experimental design, so all our findings are correlative, and we cannot put forward causal relationships. Shortly before the lockdown, people might have chosen to move away from their families because they work in health care and did not want to infect their family members. People that lived on their own before the pandemic might have agreed to isolate with others to combat their loneliness or to help with care work in the family. Those examples are likely rare and might only mildly affect our findings. Even though we were not able to control for confounding variables, some pre-existing factors, such as age and gender, may at least indicate a direction of effect.

Third, longitudinal effects of the pandemic were not measured. We present the data of the first week when the COVIDiSTRESS Global Survey went online, and participants were only allowed to participate once. It would be beneficial for future studies to measure the long-term effects and the development of stress within a sample.

Fourth, the pandemic had been spreading in countries and areas at various rates during data collection. Therefore, people from different countries and different regions within a country possibly were under different levels of threat as well as different time spans of exposure. It is important for future studies to further investigate whether there are dose-response relationships between stress and the level of threat in the given countries.

CONCLUSIONS

The present study contributes to a better understanding of the relationship between the presence of others and perceived stress during the COVID-19 lockdown. Moreover, our results add to the limited literature on people during the pandemic. These insights highlight the need to focus on neglected groups (i.e. women, younger, single people, with children, and with lower education status) both in research and in public health interventions, as they may be especially susceptible to experiencing elevated levels of stress, with their psychological well-being being compromised.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

REFERENCES

- Abidin, R.R. (1995). *Manual for the Parenting Stress Index*. Odessa, FL: Psychological Assessment Resources.
- Angeles, L. (2010). Children and life satisfaction. *Journal of Happiness Studies*, *11*, 523–538. <https://doi.org/10.1007/s10902-009-9168-z>.
- Archer, J.A., Lim, Z.M.T., Teh, H.C., Chang, W.C., & Chen, S.H.A. (2015). The effect of age on the relationship between stress, well-being and health in a Singaporean sample. *Ageing International*, *40*(4), 413–425. <https://doi.org/10.1007/s12126-015-9225-3>.
- Archuleta, K.L., Britt, S.L., Tonn, T.J., & Grable, J.E. (2011). Financial satisfaction and financial stressors in marital satisfaction. *Psychological Reports*, *108*(2), 563–576. <https://doi.org/10.2466/07.21.PR0.108.2.563-576>.
- Bergdahl, J., & Bergdahl, M. (2002). Perceived stress in adults: Prevalence and association of depression, anxiety and medication in a Swedish population. *Stress and Health*, *18*(5), 235–241. <https://doi.org/10.1002/smi.946>.
- Bodenmann, G. (2005). Dyadic coping and its significance for marital functioning. In T.A. Revenson, K. Kayser, & G. Bodenmann (Eds.), *Couples coping with stress: Emerging perspectives on dyadic coping* (pp. 33–49). Washington, DC: American Psychological Association. <https://doi.org/10.1037/11031-002>.
- Braithwaite, S.R., Delevi, R., & Fincham, F.D. (2010). Romantic relationships and the physical and mental health of college students. *Personal Relationships*, *17*(1), 1–12. <https://doi.org/10.1111/j.1475-6811.2010.01248.x>.
- Chen, F., Curran, P.J., Bollen, K.A., Kirby, J., & Paxton, P. (2008). An empirical evaluation of the use of fixed cutoff points in RMSEA test statistic in structural equation models. *Sociological Methods & Research*, *36*(4), 462–494. <https://doi.org/10.1177/0049124108314720>.
- Cheung, G.W., & Rensvold, R.B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling: A Multidisciplinary Journal*, *9*(2), 233–255. https://doi.org/10.1207/S15328007SEM0902_5.

- Chin, B., Murphy, M.L., Janicki-Deverts, D., & Cohen, S. (2017). Marital status as a predictor of diurnal salivary cortisol levels and slopes in a community sample of healthy adults. *Psychoneuroendocrinology*, *78*, 68–75. <https://doi.org/10.1016/j.psyneuen.2017.01.016>.
- Chun, C.A., Moos, R.H., & Cronkite, R.C. (2006). Culture: A fundamental context for the stress and coping paradigm. In P.T.P. Wong & L.C.J. Wong (Eds.), *Handbook of multicultural perspectives on stress and coping* (pp. 29–53). Boston, MA: Springer.
- Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior*, *24*(4), 385–396. <https://doi.org/10.2307/2136404>.
- Cohen, S., & Williamson, G. (1988). Perceived stress in a probability sample of the United States. In S. Spacapan & S. Oskamp (Eds.), *Social psychology of health* (pp. 31–67). Thousand Oaks, CA: Sage.
- Cohen, S., & Wills, T.A. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin*, *98*(2), 310–357. <https://doi.org/10.1037/0033-2909.98.2.310>.
- COVIDiSTRESS Global Survey Research Network (2020). COVIDiSTRESS global survey [Data set, pre-registration, and full project]. <https://doi.org/10.17605/OSF.IO/Z39US>.
- Dar, A.W. (2017). Cross cultural understanding of stress and coping mechanisms. *International Journal of Research in Engineering, IT and Social Sciences*, *7*(10), 75–80. https://www.researchgate.net/publication/331372626_Cross_Cultural_Understanding_of_Stress_and_Coping_Mechanisms.
- De Vaus, D.A., Lixia, Q. & Australian Institute of Family Studies (2015). Living alone and personal wellbeing. Melbourne: Australian Institute of Family Studies. Retrieved 15 April 2020, from: <http://nla.gov.au/nla.obj-400677505>.
- Epstein, Y.M. (1981). Crowding stress and human behavior. *Journal of Social Issues*, *37* (1), 126–144. <https://doi.org/10.1111/j.1540-4560.1981.tb01060.x>.
- Feizi, A., Aliyari, R., & Roohafza, H. (2012). Association of perceived stress with stressful life events, lifestyle and sociodemographic factors: A large-scale community-based study using logistic quantile regression. *Computational and Mathematical Methods in Medicine*, *2012*, 151865. doi: 10.1155/2012/15186.
- Frackowiak, T., Oleszkiewicz, A., Butovskaya, M., Groyecka, A., Karwowski, M., Kowal, M., & Sorokowski, P. (2020). Subjective happiness among Polish and Hadza people. *Frontiers in Psychology*, *11*, 1173. <https://doi.org/10.3389/fpsyg.2020.01173>.
- Fuller, T.D., Edwards, J.N., Vorakitphokatorn, S., & Sermsri, S. (1996). Chronic stress and psychological well-being: Evidence from Thailand on household crowding. *Social Science & Medicine*, *42*(2), 265–280. [https://doi.org/10.1016/0277-9536\(95\)00089-5](https://doi.org/10.1016/0277-9536(95)00089-5).
- Gao, W., Ping, S., & Liu, X. (2019). Gender differences in depression, anxiety, and stress among college students: A longitudinal study from China. *Journal of Affective Disorders*, *263*, 292–300. <https://doi.org/10.1016/j.jad.2019.11.121>.
- Google (2020, 5 August). COVID-19 community mobility reports. <https://www.google.com/covid19/mobility/>.
- Gottlieb, B.H., & Wagner, F. (1991). Stress and support processes in close relationships. In J. Eckenrode (Ed.), *The social context of coping* (pp. 165–188). New York: Plenum. https://doi.org/10.1007/978-1-4899-3740-7_8.

- Haskett, M.E., Ahern, L.S., Ward, C.S., & Allaire, J.C. (2006). Factor structure and validity of the parenting stress index-short form. *Journal of Clinical Child and Adolescent Psychology*, 35, 302–312. https://doi.org/10.1207/s15374424jccp3502_14.
- Helms, H.M., Supple, A.J., Su, J., Rodriguez, Y., Cavanaugh, A.M., & Hengstebeck, N.D. (2014). Economic pressure, cultural adaptation stress, and marital quality among Mexican-origin couples. *Journal of Family Psychology*, 28(1), 77–87. <https://doi.org/10.1037/a0035738>.
- Hofstede, G. (2001). *Culture's consequences: Comparing values, behaviors, institutions, and organizations across nations*. Thousand Oaks, CA: Sage Publications.
- Hofstede, G., Hofstede, G.J., & Minkov, M. (2010). *Cultures and organizations – Software of the mind* (3rd edn.). New York: McGraw-Hill. <https://doi.org/10.1111/j.1530-0277.2008.00679.x>.
- Hu, L.T., & Bentler, P.M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, 6(1), 1–55. <https://doi.org/10.1080/10705519909540118>.
- Hudson, S.A., & O'Regan, J. (1994). Stress and the graduate psychology student. *Journal of Clinical Psychology*, 50(6), 973–977. [https://doi.org/10.1002/1097-4679\(199411\)50:6<973::AID-JCLP2270500623>3.0.CO;2-Q](https://doi.org/10.1002/1097-4679(199411)50:6<973::AID-JCLP2270500623>3.0.CO;2-Q).
- Huppert, F.A. (2009). Psychological well-being: Evidence regarding its causes and consequences. *Applied Psychology: Health and Well-Being*, 1(2), 137–164. <https://doi.org/10.1111/j.1758-0854.2009.01008.x>.
- Jacob, L., Haro, J.M., & Koyanagi, A. (2019). Relationship between living alone and common mental disorders in the 1993, 2000 and 2007 National Psychiatric Morbidity Surveys. *PLoS ONE*, 14(5), e0215182. <https://doi.org/10.1371/journal.pone.0215182>.
- Jorgensen, T.D., Pornprasertmanit, S., Schoemann, A.M., & Rosseel, Y. (2019). *semTools: Useful tools for structural equation modeling*. R package version 0.5-2. <https://CRAN.R-project.org/package=semTools>.
- Karowski, M., Kowal, M., Groyecka, A., Białek, M., Lebuda, I., Sorokowska, A., & Sorokowski, P. (2020). When in danger, turn right: Does Covid-19 threat promote social conservatism and right-wing presidential candidates? *Human Ethology*, 35, 37–48. <https://doi.org/10.22330/he/35/037-048>.
- Kiecolt-Glaser, J.K., & Newton, T.L. (2001). Marriage and health: His and hers. *Psychological Bulletin*, 127(4), 472–503. <https://doi.org/10.1037/0033-2909.127.4.472>.
- Kim, H.S., Sherman, D.K., & Taylor, S.E. (2008). Culture and social support. *American Psychologist*, 63(6), 518–526. <https://doi.org/10.1037/0003-066X>.
- Kowal, M., Sorokowski, P., Sorokowska, A., Dobrowolska, M., Pisanski, K., Oleszkiewicz, A., . . . Zupančič, M. (2020). Reasons for Facebook usage: Data from 46 countries. *Frontiers in Psychology*, 11, 711. <https://doi.org/10.3389/fpsyg.2020.00711>.
- Kyprianides, A., & Easterbrook, M.J. (2020). Social factors boost well-being behind bars: The importance of individual and group ties for prisoner well-being. *Applied Psychology: Health and Well-Being*, 12(1), 7–29. <https://doi.org/10.1111/aphw.12171>.
- Lee, K.S., & Ono, H. (2012). Marriage, cohabitation, and happiness: A cross-national analysis of 27 countries. *Journal of Marriage and Family*, 74(5), 953–972. <https://doi.org/10.1111/j.1741-3737.2012.01001.x>.

- Li, J.B., Yang, A., Dou, K., Wang, L.-X., Zhang, M.-C., & Lin, X. (2020). Chinese public's knowledge, perceived severity, and perceived controllability of the COVID-19 and their associations with emotional and behavioural reactions, social participation, and precautionary behaviour: A national survey. *PsyArXiv*, <https://doi.org/10.31234/osf.io/5tmsh>.
- Limcaoco, R.S.G., Mateos, M.E., Fernandez, M.J., & Roncero, C. (2020). Anxiety, worry and perceived stress in the world due to the COVID-19 pandemic. *medRxiv*. doi: <https://doi.org/10.1101/2020.04.03.20043992>.
- Merz, C.A., Meuwly, N., Randall, A.K., & Bodenmann, G. (2014). Engaging in dyadic coping: Buffering the impact of everyday stress on prospective relationship satisfaction. *Family Science*, 5(1), 30–37. <https://doi.org/10.1080/19424620.2014.927385>.
- Minello, A. (2020). The pandemic and the female academic. *Nature*. <https://doi.org/10.1038/d41586-020-01135-9>.
- Mroczek, D.K., & Kolarz, C.M. (1998). The effect of age on positive and negative affect: A developmental perspective on happiness. *Journal of Personality and Social Psychology*, 75(5), 1333–1349. <https://doi.org/10.1037//0022-3514.75.5.1333>.
- Oarga, C., Stavrova, O., & Fetchenhauer, D. (2015). When and why is helping others good for well-being? The role of belief in reciprocity and conformity to society's expectations. *European Journal of Social Psychology*, 45(2), 242–254. <https://doi.org/10.1002/ejsp.2092>.
- Ordiozola-González, P., Planchuelo-Gómez, Á., Irurtia-Muñiz, M.J., & de Luis-García, R. (2020). Psychological symptoms of the outbreak of the COVID-19 crisis and confinement in the population of Spain. *PsyArXiv*. <https://doi.org/10.31234/osf.io/mq4fg>.
- Persike, M., & Seiffge-Krenke, I. (2012). Competence in coping with stress in adolescents from three regions of the world. *Journal of Youth and Adolescence*, 41(7), 863–879. <https://doi.org/10.1007/s10964-011-9719-6>.
- Radloff, R.W., & Helmreich, R. (1968). *Groups under stress: Psychological research in Sealab II*. New York: Appleton-Century-Crofts.
- Raftery, A.E. (1999). Bayes factors and BIC: Comment on “A critique of the Bayesian information criterion for model selection”. *Sociological Methods & Research*, 27(3), 411–427. <https://doi.org/10.1177/0049124199027003005>.
- Roberti, J.W., Harrington, L.N., & Storch, E.A. (2006). Further psychometric support for the 10-item version of the Perceived Stress Scale. *Journal of College Counseling*, 9(2), 135–147. <https://doi.org/10.1002/j.2161-1882.2006.tb00100.x>.
- Roberts, N.A., & Levenson, R.W. (2001). The remains of the workday: Impact of job stress and exhaustion on marital interaction in police couples. *Journal of Marriage and Family*, 63(4), 1052–1067. <https://doi.org/10.1111/j.1741-3737.2001.01052.x>.
- Rosseel, Y. (2012). Lavaan: An R package for structural equation modeling and more. Version 0.5–12 (BETA). *Journal of Statistical Software*, 48(2), 1–36. <https://doi.org/10.18637/jss.v048.i02>.
- Schwartz, S.H. (2009). Culture matters: National value cultures, sources and consequences. In C.-Y. Chiu, Y.Y. Hong, S. Shavitt, & R.S. Wyer Jr. (Eds.), *Understanding culture: Theory, research and application* (pp. 127–150). New York: Psychology Press.

- Sim, K., Huak Chan, Y., Chong, P.N., Chua, H.C., & Wen Soon, S. (2010). Psychosocial and coping responses within the community health care setting towards a national outbreak of an infectious disease. *Journal of Psychosomatic Research*, *68*(2), 195–202. <https://doi.org/10.1016/j.jpsychores.2009.04.004>.
- Sisca, S.S. (1985). Love deprivation and blood pressure levels among a college population: A preliminary investigation. *Psychology: A Quarterly Journal of Human Behavior*, *22*, 63–70.
- Sorokowski, P., Groyecka, A., Kowal, M., Sorokowska, A., Białek, M., Lebuda, I., . . . Karwowski, M. (2020). Can information about pandemics increase negative attitudes toward foreign groups? A case of COVID-19 outbreak. *Sustainability*, *12*(12), 4912. <https://doi.org/10.3390/su12124912>.
- Sorokowski, P., Kowal, M., & Sorokowska, A. (2019). Religious affiliation and marital satisfaction: Commonalities among Christians, Muslims, and atheists. *Frontiers in Psychology*, *10*, 2798. <https://doi.org/10.3389/fpsyg.2019.02798>.
- Stanca, L. (2012). Suffer the little children: Measuring the effects of parenthood on well-being worldwide. *Journal of Economic Behavior & Organization*, *81*(3), 742–750. <https://doi.org/10.1016/j.jebo.2010.12.019>.
- Stein, A., Krebs, G., Richter, L., Tomkins, A., Rochat, T., & Bennish, M.L. (2005). Babies of a pandemic. *Archives of Disease in Childhood*, *90*, 116–118. <https://doi.org/10.1136/adc.2004.049361>.
- Stone, A.A., Schwartz, J.E., Broderick, J.E., & Deaton, A. (2010). A snapshot of the age distribution of psychological well-being in the United States. *Proceedings of the National Academy of Sciences, USA*, *107*(22), 9985–9990. <https://doi.org/10.1073/pnas.1003744107>.
- Tay, L., Tan, K., Diener, E., & Gonzalez, E. (2013). Social relations, health behaviors, and health outcomes: A survey and synthesis. *Applied Psychology: Health and Well-Being*, *5*(1), 28–78. <https://doi.org/10.1111/aphw.12000>.
- 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. <https://doi.org/10.1186/1471-2458-8-347>.
- Tian, F., Li, H., Tian, S., Yang, J., Shao, J., & Tian, C. (2020). Psychological symptoms of ordinary Chinese citizens based on SCL-90 during the level I emergency response to COVID-19. *Psychiatry Research*, *288*, 112992. <https://doi.org/10.1016/j.psychres.2020.112992>.
- Tigani, X., Artemiadis, A.K., Alexopoulos, E.C., Chrousos, G.P., & Darviri, C. (2011). Gender differences in Greek centenarians. A cross-sectional nation-wide study, examining multiple socio-demographic and personality factors and health locus of control. *BMC Geriatrics*, *11*(1), <https://doi.org/10.1186/1471-2318-11-87>.
- Triandis, H.C., McCusker, C., & Hui, C.H. (1990). Multimethod probes of individualism and collectivism. *Journal of Personality and Social Psychology*, *59*(5), 1006–1020. <https://doi.org/10.1037/0022-3514.59.5.1006>.
- Vermeulen, L.P. (1977). Small-group behaviour in long-term isolation. *South African Journal of Sociology*, *15*, 35–40. <https://doi.org/10.1080/02580144.1977.10429245>.
- Waite, L.J., & Gallagher, M. (2001). *The case for marriage: Why married people are happier, healthier, and better off financially*. New York: Doubleday.

- Wang, C., Pan, R., Wan, X., Tan, Y., Xu, L., Ho, C.S., & Ho, R.C. (2020). Immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease (COVID-19) epidemic among the general population in China. *International Journal of Environmental Research and Public Health*, 17(5), 1729. <https://doi.org/10.3390/ijerph17051729>.
- World Health Organization (2020a). Report of the WHO-China joint mission on Coronavirus Disease 2019 (COVID-19). https://www.who.int/docs/default-source/coronavirus/who-china-joint-mission-on-covid-19---final-report-1100hr-28feb2020-11mar-up-date.pdf?sfvrsn=1a13fda0_2&download=true.
- World Health Organization (2020b). Coronavirus disease (COVID-2019) situation reports. Retrieved 10 June 2020, from: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports>.
- Worldometer (2020). Countries in the world by population (2020). Retrieved 10 June 2020, from: <https://www.worldometers.info/world-population/population-by-country/>.

SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of the article.

Table S1. Descriptive statistics of gender, marital status, age, the number of adults and children under 12 individuals were staying with during the data collection, and country's score on Hofstede individualism scale.

Table S2. Means, standard deviations and Cronbach's alphas of the Perceived Stress Scale across countries.

Table S3. Results of a Multilevel Model, With Participants Nested Within Countries, and Random Effects for Both Intercepts and Slopes for age, gender, isolation, and marital status with variables in a raw form.

Table S4. Responses on the question: 'What best describes your current situation?', with respect to countries.

Table S5. The number of citizens across countries and the number of confirmed cases across days of data collection (with an early launch in Denmark – March 28 and 29).

Table S6. The number of participants with the given education level (the highest completed education) with respect to countries.

Figure S1. Three scatter plots, depicting relationships between perceived stress and the number of people (A), children (B), and adults (C) an individual was staying with during the relative isolation.