ELSEVIER

Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Short communication

Psychological distress associated with the second COVID-19 wave: Prospective evidence from the UK Household Longitudinal Study

Michael Daly [a,*], Eric Robinson [b]

[a] Department of Psychology, Maynooth University, Co. Kildare, Ireland
[b] Institute of Population Health Sciences, University of Liverpool, Liverpool, United Kingdom

ABSTRACT

Background: In late 2020 a second wave of COVID-19 infections occurred in many countries and resulted in a national lockdown in the UK including stay at home orders and school closures. This study aimed to compare the prevalence of psychological distress before and during the second COVID-19 wave in the UK.
Methods: This study drew on data from 10,657 participants from the nationally representative probability-based UK Household Longitudinal Study (UKHLS). The 12-item General Health Questionnaire (GHQ-12) assessment measure was used to detect the proportion of UK adults experiencing clinically significant psychological distress. Changes in distress levels associated with the second pandemic wave were examined between September 2020 and January 2021 using logistic regression and linear fixed-effects regression models.
Results: Longitudinal analyses showed that the prevalence of clinically significant distress rose by 5.8% (95% CI: 4.4–7.2) from 21.3% in September 2020 to 27.1% in January 2021, compared with a 2019 pre-pandemic estimate of 21% in this cohort. Fixed effects analyses confirmed that the second COVID-19 wave was associated with a significant within-person increase in distress (d = 0.15, p < .001). Increases were particularly pronounced among those with school-age children in the home.
Limitations: A non-specific measure of mental health symptoms was utilized and it was not possible to separate the potential impact of the pandemic from other changes occurring in tandem within the study period.
Conclusion: Clinically significant distress rose during the second wave of the COVID-19 pandemic and reached levels similar to those observed in the immediate aftermath of the first pandemic wave.

1. Introduction

A recent meta-analysis of longitudinal studies has shown that there was an increase in mental health symptoms during the first wave of the COVID-19 pandemic (March–April 2020) followed by a decline in symptoms to pre-pandemic levels by the summer of 2020 (Robinson et al., 2021). Similarly, in the UK the prevalence of general mental distress rose substantially and remained elevated in the early stages of the pandemic (April–June 2020) (Burdett et al., 2021; Daly et al., 2021; O'Connor et al., 2021; Pierce et al., 2020) before declining to pre-pandemic levels (July–September 2020) in a large nationally representative cohort study (Daly and Robinson, 2021a).

A decline in mental health symptoms in the months following the pandemic outbreak has been identified in other large-scale studies (Fancourt et al., 2021; Daly and Robinson, 2021b; Hyland et al., 2021a; Pierce et al., 2021). This decrease in distress has been attributed to a

variety of potential influences. For instance, people may have psychologically adapted to the demands of the pandemic or felt less distress due to reduced health-related anxieties and financial worries as the severity of the pandemic eased. It is also possible that a decline in enforced isolation following the easing of lockdown restrictions may have alleviated psychological distress (Fancourt et al., 2021; Robinson and Daly, 2021).

However, during late 2020/early 2021 there was a 'second wave' of COVID-19 infections in many countries and in the UK this resulted in a national social lockdown. Because the population had lived with and adapted to the pandemic over several months at this stage, mental health may have been resilient during the second wave. However, similar to the first wave of the pandemic, it is also feasible that the rapid rise in recorded deaths per day and the reintroduction of stringent national lockdown measures, including the closure of schools (Cheng et al., 2021), could have led to a rise in distress.

This study aimed to estimate changes in psychological distress from September 2020 to late-January 2021 in the UK population using data from the UK Household Longitudinal Study (UKHLS). This study also aimed to decipher whether changes in distress levels over this period differed as a function of a set of demographic characteristics (age, sex, race/ethnicity, educational attainment, have school-aged children) and COVID-19 risk factors (in at-risk patient group, probable COVID-19 infection).

2. Methods

2.1. Study sample

Participants were drawn from the UKHLS, a nationally representative probability-based longitudinal study of UK community dwelling adults aged 18 and over (Institute for Social and Economic Research, 2020). Data has been collected continuously since January 2009 and 18,539 participants provided distress data in 2019 immediately prior to the pandemic. During the pandemic distress data was collected from the UKHLS sample on eight occasions using online surveys completed by participants on the last week of each month in April (N = 16,051), May (N = 14,442), June (N = 13,730), July (N = 13,395), September (N = 12,419), and November 2020 (N = 11,677) and in January (N = 11,536) and March 2021 (N = 12,239). In this study, we first examine the overall time trend in clinically significant distress from 2019 to March 2021 across all nine waves of survey data available in the UKHLS (N = 19,966 participants, Observations = 124,028).

Next, to estimate within-person changes in distress during the second wave of the pandemic we compared distress levels assessed between September 24 and October 1, 2020 with distress levels assessed between January 27 and February 3, 2021. This comparison was chosen as the September 2020 assessment was immediately prior to the second COVID-19 wave and the January 2021 assessment took place one month after the reintroduction of national lockdown restrictions in England from January 6th 2021 and a week after the UK 7-day rolling average of COVID-19 related deaths peaked during the second wave on January 19 2021 (Public Health England, n.d.). At the point of assessment in January 2021 restrictions in place included stay at home orders, working from home and closure of schools and all non-essential retail.

Of 11,536 adults who provided distress data as part of the January 2021 survey wave 11,097 (96%) provided complete covariate data. Distress data from September 2020 was available for 9977 participants and missing baseline data was imputed using distress data from the preceding wave (July) for a further 680 participants to give a final sample size of 10,657. July baseline data was used in 6.3% of cases to maximise the sample size and because prior analyses had shown that distress levels at this time were highly similar to those observed in September 2020, the baseline time-point utilized for the majority of participants (see Fig. 1). In total, 96% of eligible participants from the January 2021 wave had distress data from prior to the second COVID-19 wave.

This study was performed in accordance with the Declaration of Helsinki and informed consent was obtained from all participants. Ethics approval for this secondary data analysis was waived by Maynooth University Social Research Ethics Sub-Committee.

2.2. Measures

2.2.1. Psychological distress

Participants completed the General Health Questionnaire-12 (GHQ-12), a well-validated measure of general mental distress (Goldberg et al., 1997). The scale is comprised of items assessing depressive symptoms, sleep difficulties, and feelings of strain and loss of confidence. Participants rate how often they have experienced each symptom in the past few weeks. Scores are dichotomized following a standard scoring system to produce a symptom score (ranging from 0 to 12) and scores of 4 or greater are indicative of the presence of significant levels of distress or probable non-psychotic psychiatric cases (Goldberg et al., 1997), termed 'clinically significant psychological distress' (Daly and Robinson, 2021a; Pierce et al., 2020).
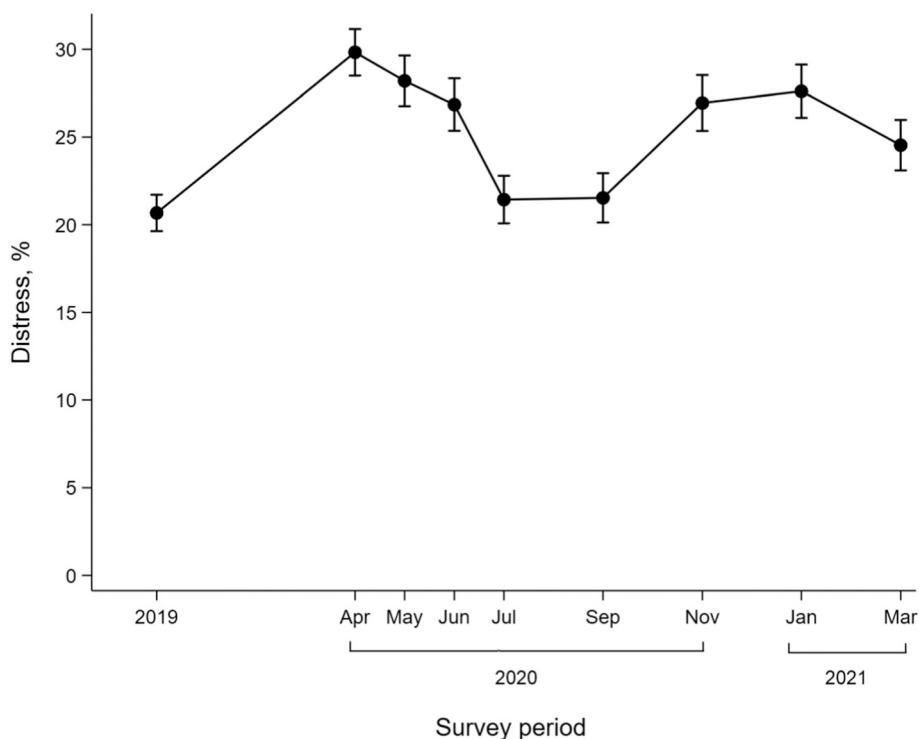

Fig. 1. Estimated percentage of UK adults reporting clinically significant psychological distress in 2019 and throughout the COVID-19 pandemic from April 2020 to March 2021 (n = 19,966, observations = 124,028). Percentages and 95% CIs from weighted analyses are plotted.

2.2.2. Covariates

The January 2021 survey wave included information of participants' age (grouped into 16–39, 40–59, 60+ years), sex (male, female), race/ethnicity (White, non-White including Black, Asian, and other ethnicities), whether there were children of school-going age (4–18 years) in the home, whether the participant was a National Health Service (NHS) shielded patient, and whether the participant reported testing positive for COVID-19 or experienced symptoms of COVID-19 between November and January 2021. Socioeconomic status was gauged using participants' highest educational qualification (no degree vs. degree) reported in 2017–2019.

2.3. Statistical analysis

Temporal trends in distress can be examined in the UKHLS using repeated cross-sectional or longitudinal analyses (e.g. Pierce et al., 2020). Repeated cross-sectional analyses utilize all distress assessments collected at each time-point to examine changes in prevalence levels using cross-sectional survey weights to account for unequal selection probabilities and differential nonresponse and facilitate population inferences (ISER, 2020). In this study, we first carried out repeated cross-sectional analysis of distress levels using logistic regression analysis followed by the Stata margins postestimation command (Long and Freese, 2014). This allowed changes in the average predicted probability of clinically significant distress to be estimated across nine waves of the UKHLS conducted between 2019 and March 2021. The Stata lincom command was then used to estimate changes in the predicted probability of distress from before to during the second COVID-19 wave. All predicted probabilities were multiplied by 100 to represent percentage point changes.

Next, longitudinal analyses were carried out because it is possible that changes in the sample composition over time, which could be correlated with the severity of the pandemic, may not be fully accounted for by the UKHLS survey weights. By examining changes in the distress levels of the same participants over time it is possible to ensure that patterns of change cannot be attributable to changes in the characteristics of the sample. Specifically, the longitudinal analysis was restricted to participants with data available both immediately prior to and during the second pandemic wave and this sample was used to estimate longitudinal changes in distress levels between September 2020 and January 2021. In addition, changes in distress across population sub-groups were examined. Finally, within-person changes in the number of symptoms reported by participants were estimated using fixed-effects regression.

3. Results

The estimated percentage of UK adults experiencing clinically significant distress from 2019 to March 2021 is displayed in Fig. 1. There was a substantial rise in distress in April 2020 following the first wave of the pandemic, from 20.7% to 29.8% after which the percentage of the sample reporting significant distress levels declined to approximately pre-pandemic levels between July (21.4%) and September (21.5%), as has been previously reported (Daly and Robinson, 2021a; Pierce et al., 2020). Our repeated cross-sectional analyses showed that distress levels then increased significantly by 6.1% (95% CI: 4.1–8.1, p < .001) from 21.5% in September to 27.6% by the end of January 2021. After this point, there was evidence of a significant decline in distress of 3.1% (95% CI: 1.0–5.1, p < .01) by the end of March 2021.

We then used longitudinal analyses to further probe the increase in distress observed during the second COVID-19 wave. These analyses confirmed that the prevalence of clinically significant psychological distress increased by 5.8% (95% CI: 4.4–7.2, p < .001) from 21.3% in September 2020 to 27.1% in January 2021 (effect size estimate: d = 0.18) among participants with data available before and during the second wave (Table 1). Fixed-effects regression analyses showed that a

statistically significant 0.51 point (95% CI: 0.40–0.63, p < .001) within-person increase in the number of symptoms experienced from 2.10 to 2.61 occurred during this period (d = 0.15). All demographic groups examined experienced a statistically significant increase in clinically significant distress during the second COVID-19 wave (see Table 1), with the exception of non-White participants and NHS shielded patients, which may be due to the small number of participants (<10% of sample) for these sub-groups.

Interaction tests showed that the differences between demographic groups in the changes in distress experienced from September 2020 to January 2021 were not statistically significant with the exception of the interaction between having school-aged children in the home and study wave. This interaction showed that those with school-aged children experienced an 11% increase in clinically significant distress. This

Table 1
Longitudinal changes in the prevalence of clinically significant psychological distress in the UK Household Longitudinal Study during the second wave of the COVID-19 pandemic from September 2020 to January 2021 (n = 10,657).

Demographic characteristic	%	September 2020 survey wave	January 2021 survey wave	Change from Sep. 2020 to Jan. 2021
		% (95% CI)	% (95% CI)	% (95% CI)
Overall sample	–	21.3 (19.9–22.7)	27.1 (25.6–28.6)	5.8*** (4.4–7.2)
Age group				
18–39 years	28.5	26.0 (22.7–29.4)	32.0 (28.4–35.7)	6.0** (2.5–9.5)
40–59 years	35.3	22.3 (20.1–24.6)	27.6 (25.3–29.9)	5.3*** (3.3–7.3)
60+ years	36.2	16.5 (14.7–18.3)	22.6 (20.3–24.9)	6.1*** (3.9–8.3)
Sex				
Male	47.0	16.5 (14.3–18.6)	20.3 (18.2–22.4)	3.9*** (2.0–5.7)
Female	53.0	25.5 (23.7–27.4)	33.0 (31.0–35.1)	7.5*** (5.3–9.7)
Race/ethnicity				
White	92.3	21.4 (20.0–22.9)	27.3 (25.8–28.9)	5.9*** (4.5–7.3)
Non-White	7.7	19.6 (13.6–25.7)	23.8 (17.3–30.3)	4.2 (−2.6–10.9)
Educational attainment				
Degree	42.3	22.8 (21.0–24.7)	29.7 (27.7–31.6)	6.8*** (5.0–8.6)
No degree	57.7	20.1 (18.0–22.2)	25.2 (23.0–27.3)	5.1*** (3.0–7.1)
Children (4–18 years)				
Present	21.1	20.9 (17.8–24.0)	31.9 (28.6–35.3)	11.0*** (7.9–14.1)
Not present	78.9	21.4 (19.7–23.0)	25.8 (24.0–27.4)	4.4*** (2.8–6.0)
Shielded patient[c]				
Yes	6.0	26.7 (19.6–33.9)	28.6 (21.5–35.8)	1.9 (−5.5–9.3)
No	94.0	20.9 (19.4–22.4)	27.0 (25.4–28.5)	6.0*** (4.6–7.5)
COVID-19 status				
Reported positive test	3.9	20.7 (12.1–29.3)	30.0 (21.0–38.9)	9.2* (1.9–16.5)
Reported symptoms	4.5	28.7 (21.9–35.4)	37.0 (30.0–44.1)	8.3* (1.1–15.5)
No positive test or symptoms reported	91.6	20.9 (19.4–22.4)	26.5 (24.9–28.0)	5.5*** (4.0–7.0)

Note: Analyses are weighted. Estimates are from marginal effects calculated after logistic regression with clustered standard errors.
* p < .05.
** p < .01.
*** p < .001.

increase was statistically significantly larger than the 4.4% increase experienced by other groups (difference = 6.6%, 95% CI: 3.1–10.2, p < .001).

4. Discussion

In the present study of a nationally representative longitudinal cohort of UK adults, both repeated cross-sectional and longitudinal analyses showed that the proportion of participants reporting high levels of recent distress increased by approximately 6 percentage points during the second major wave of the COVID-19 pandemic. Specifically, we observed an increase in distress to 27% in January 2021, compared to 21% when measured among the same participants in September 2020. The elevated distress levels observed during January 2021 were comparable to those observed during the outbreak of the pandemic in April 2020 and higher than pre-pandemic levels in this cohort (21% in 2019). Therefore, the COVID-19 second wave and associated restrictions in the UK appear were associated with a similar level of psychological distress as was observed during the pandemic first wave.

The magnitude of the changes in distress observed in the present study (d = 0.15–0.18) was modest and in line with the results of meta-analyses that found a significant but statistically small increase in mental health symptoms during the first wave of the pandemic (Prati and Mancini, 2021; Robinson et al., 2021). Further, in line with research examining changes in mental health during the first wave of the pandemic (Daly et al., 2021; Daly and Robinson, 2021b; Prati, 2021), there was consistent evidence that most population demographics experienced an increase in distress.

Parents of school-aged children experienced a particularly pronounced increase in distress. This likely reflects the competing time demands of work, home schooling, and childcare responsibilities as was observed in the first pandemic wave (Cheng et al., 2021). Although not significantly different, females experienced an increase in distress that was almost twice as large as the increase experienced by males. Evidence from the first wave of the pandemic suggests that women may be particularly likely to experience an increase in distress during the national lockdown because they shoulder an unequal share of caring and household responsibilities and experience larger increases in feelings of loneliness than men (Cheng et al., 2021; Etheridge and Spantig, 2020).

The present findings suggest that increases in distress were not limited to the first wave of the pandemic and highlight the need for continuous monitoring of the mental health burden associated with pandemic severity and restrictions. The findings also provide evidence that adaptation may have occurred following the second pandemic wave with distress levels dropping by 3% by the end of March 2021. One question that remains is whether the rise in psychological distress led to more severe mental health consequences such as increases in suicidal behaviors. An examination of data from 21 middle-to-high income countries showed that suicide trends were unchanged following the emergence of the pandemic despite a rise in distress at this time (Pirkis et al., 2021; Robinson et al., 2021). As such, existing research suggests that the uptick in distress in the community during the second major wave of the pandemic in the UK is likely to be transitory and may not translate to a rise in suicide levels. However, this may be an optimistic scenario and further investigation of the impact of the COVID-19 pandemic beyond the initial wave is needed.

Strengths of the present research include the use of a large nationally representative cohort study with high frequency assessment allowing changes in distress during the second wave of the pandemic to be quantified. The GHQ-12 is a measure of non-specific symptoms and because there is evidence that changes in mental health during the pandemic may be symptom specific (Robinson et al., 2021), it will be important to examine how symptoms of individual disorder types have changed as a result of the second wave of the pandemic. In addition, the observational nature of this study means it is not possible to attribute the rise in distress observed between September and the end of January

specifically to the pandemic. One concern is the potential role of seasonality in impacting psychological distress levels. However, prior analyses of approximately 300,000 observations from the UKHLS sample from 2009 to 2019 found little evidence for seasonality in mental health problems as gauged using the GHQ-12 (Daly et al., 2021). For example, distress levels in January were just 0.5% above September levels and did not differ significantly when contrasted. Finally, while demographic factors that may moderate changes in distress were examined in this study, the possibility of unique trajectories of distress and adjustment across the course of the pandemic was not examined. For example, prior research has identified divergent patterns of distress whereby some participants are 'resilient' and others experience deterioration or recovery in psychological distress during the pandemic (Hyland et al., 2021b; Piece et al., 2021).

In conclusion, this nationally representative longitudinal study found that clinically significant distress rose during the second wave of the COVID-19 pandemic reaching levels comparable to those observed immediately following the first pandemic wave.

Ethical standards

The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008.

CRediT authorship contribution statement

The study was designed by all authors. MD analysed the data. The manuscript was drafted by MD and ER. All authors critically revised the manuscript and agree to be accountable for all aspects of the work.

Conflict of interest

All authors report no conflicts of interest. ER has previously received funding from the American Beverage Association and Unilever for projects unrelated to the present research.

References

Burdett, A., Davillas, A., Etheridge, B., 2021. Weather, mental health, and mobility during the first wave of the COVID-19 pandemic. Health Econ. 30, 2296–2306.

Cheng, Z., Mendolia, S., Paloyo, A.R., Savage, D.A., Tani, M., 2021. Working parents, financial insecurity, and childcare: mental health in the time of COVID-19 in the UK. Rev. Econ. Househ. 19, 123–144.

Daly, M., Robinson, E., 2021a. Longitudinal changes in psychological distress in the UK from 2019 to September 2020 during the COVID-19 pandemic: evidence from a large nationally representative study. Psychiatry Res. 300, 113920.

Daly, M., Robinson, E., 2021b. Psychological distress and adaptation to the COVID-19 crisis in the United States. J. Psychiatr. Res. 136, 603–609.

Daly, M., Sutin, A.R., Robinson, E., 2021. Longitudinal changes in mental health and the COVID-19 pandemic: evidence from the UK household longitudinal study. Psychol. Med. https://doi.org/10.1017/S0033291720004432.

Etheridge, B., Spantig, L., 2020. The gender gap in mental well-being during the COVID-19 outbreak: evidence from the UK (No. 2020-08). In: ISER Working Paper Series.

Fancourt, D., Steptoe, A., Bu, F., 2021. Trajectories of anxiety and depressive symptoms during enforced isolation due to COVID-19 in England: a longitudinal observational study. Lancet Psychiatry 8, 141–149.

Goldberg, D.P., Gater, R., Sartorius, N., Ustun, T.B., Piccinelli, M., Gureje, O., Rutter, C., 1997. The validity of two versions of the GHQ in the WHO study of mental illness in general health care. Psychol. Med. 27, 191–197.

Hyland, P., Vallières, F., McBride, O., Murphy, J., Shevlin, M., Bentall, R.P., Butter, S., Hartman, T.K., Karatzias, T., MacLachlan, M., Maguire, R., McHugh Power, J., Spikol, E., Daly, M., 2021a. Mental health of adults in Ireland during the first year of the COVID-19 pandemic: results from a nationally representative, longitudinal study. Psychol. Med. https://doi.org/10.1017/S0033291721004360.

Hyland, P., Vallières, F., Daly, M., Butter, S., Bentall, R.P., Fox, R., Karatzias, T., MacLachlan, M., McBride, O., Murphy, J., Murphy, D., 2021b. Trajectories of change in internalizing symptoms during the COVID-19 pandemic: a longitudinal population-based study. J. Affect. Disord. 295, 1024–1031.

Institute for Social and Economic Research (ISER), 2021. Understanding Society COVID-19 User Guide: Version 10.0. University of Essex, Colchester from. https://www.understandingsociety.ac.uk/sites/default/files/downloads/documentation/covid-19/user-guides/covid-19-user-guide.pdf. (Accessed 11 May 2022).

Long, J.S., Freese, J., 2014. Regression Models for Categorical Dependent Variables Using Stata. Stata Press, College Station, TX.

O'Connor, R.C., Wetherall, K., Cleare, S., McClelland, H., Melson, A.J., Niedzwiedz, C.L., O'Carroll, R.E., O'Connor, D.B., Platt, S., Scowcroft, E., Watson, B., 2021. Mental health and well-being during the COVID-19 pandemic: longitudinal analyses of adults in the UK COVID-19 Mental Health & Wellbeing study. Br. J. Psychiatry 218, 326–333.

Pierce, M., Hope, H., Ford, T., Hatch, S., Hotopf, M., John, A., Kontopantelis, E., Webb, R., Wessely, S., McManus, S., Abel, K.M., 2020. Mental health before and during the COVID-19 pandemic: a longitudinal probability sample survey of the UK population. Lancet Psychiatry 7, 883–892.

Pierce, M., McManus, S., Hope, H., Hotopf, M., Ford, T., Hatch, S.L., John, A., Kontopantelis, E., Webb, R.T., Wessely, S., Abel, K.M., 2021. Mental health responses to the COVID-19 pandemic: a latent class trajectory analysis using longitudinal UK data. Lancet Psychiatry 8, 610–619.

Prati, G., 2021. Mental health and its psychosocial predictors during national quarantine in Italy against the coronavirus disease 2019 (COVID-19). Anxiety Stress Coping. 34, 145–156.

Prati, G., Mancini, A.D., 2021. The psychological impact of COVID-19 pandemic lockdowns: a review and meta-analysis of longitudinal studies and natural experiments. Psychol. Med. 51, 201–211.

Public Health England (PHE). Deaths within 28 days of positive test by date of death. Accessed 11 May 2022 from. https://coronavirus.data.gov.uk/details/deaths.

Robinson, E., Daly, M., 2021. Explaining the rise and fall of psychological distress during the COVID-19 crisis in the United States: longitudinal evidence from the understanding America study. Br. J. Health Psychol. 26, 570–587.

Robinson, E., Sutin, A.R., Daly, M., Jones, A., 2021. A systematic review and meta-analysis of longitudinal cohort studies comparing mental health before versus during the COVID-19 pandemic. J. Affect. Disord. 296, 567–576.