Internalising and Externalising Symptoms Before and During the Initial COVID-19 Lockdown in the UK and Turkey: A Cross-cultural Examination

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Abstract

Background: The COVID-19 pandemic has had a profound effect on the mental health and wellbeing of children and young people. Culture can influence emotional and behavioural responses to the pandemic and its consequences, but research is primarily focused on single country experiences. The study examined differences in caregiver worry of infection and experience with the confinement during the initial lockdown and their impact on children's internalising and externalising symptoms across two culturally different countries which were severely affected by the pandemic: UK and Turkey.

Method: Participants were 1849 caregivers with children between 5 and 12 years old in the UK (n = 995) and Turkey (n = 854) who completed a 20-min electronic survey on child and family wellbeing distributed via social networks during the initial phase of the COVID-19 lockdown (July and August 2020).

Findings: Worry of infection was higher amongst caregivers in the Turkish sample and it independently predicted change in children's internalising symptoms in the Turkish sample only. Caregivers in the Turkish sample reported more difficulty with family coexistence during the lockdown, but regressions analysis showed that difficulty with coexistence independently predicted change in children's externalising and internalising symptoms before and during the lockdown in both samples. The study revealed cross-cultural differences in the predictors of change in children's internalising and externalising symptoms before and during the initial national COVID-19 lockdown.

Introduction

The outbreak of COVID-19 saw a worldwide implementation of fierce social distancing measures including national lockdown and self-isolation. The United Kingdom (UK) and Turkey were amongst the most seriously affected countries worldwide (Worldometer Statistics, 2020). The COVID-19 lockdown has had an unprecedented impact on the psychological wellbeing of children and young people in both countries (Adıbelli & Sümen, 2020; Creswell et al., 2021; Panchal et al., 2021). Because different countries reacted differently to the lockdown, cross-country generalisations about its impact should be avoided and more research on country-specific factors that may have influenced its effect is required to fully understand it (Fernandez Ruiz, 2021; Maaravi et al., 2021; San et al., 2021). Cultural factors can shape emotional and behavioural reactions to the consequences of the pandemic (Burkova et al., 2021). Western European cultures are known to promote individualist values of independence and self-reliance whereas the collectivist values of interdependence, compliance, and inhibition dominate in non-Western European cultures (Green et al., 2005). Children are influenced by families which are nested within wider sociocultural systems of influence (Prime et al., 2020). The cross-cultural examination of emotional reactions to the lockdown within the family context can help understand better child wellbeing and family life during the lockdown and reveal determinants of child and family wellbeing that are context specific. Compared with the UK culture, which is more individualistic, the Turkish culture is relatively collectivist (Hofstede et al., 2005). The two countries offer a natural experiment to examine cultural variability in caregiver response to the COVID-19 pandemic and coping with the lockdown and their impact on child psychological adjustment during and before the lockdown.

Worry of COVID-19 infection was a pandemic related challenge which while it encouraged adoption of preventive measures in some countries (Harper et al., 2020; Yıldırım et al., 2021), it was also found to be associated with psychological distress (Fitzpatrick et al., 2020; Kayis et al., 2021; Satici et al., 2020a). Previous research demonstrated that intolerance of uncertainty interferes with how humans appreciate the impact of an imminent threat including illness related threat (Taha et al., 2014). Threatening conditions induce worry which may lead to psychological stress (Nabi & Myrick, 2019; Witte & Allen, 2000). Additionally, there is a tendency for collectivism to be associated with less tolerance to uncertainty (Hofstede et al., 2005). Therefore, it is plausible that Turkish caregivers are at a higher risk of worry of infection compared to caregivers in less collectivist contexts. Findings from two surveys carried out in Turkey link worry of COVID-19 with worry of uncertainty (Satici et al., 2020b; Pak et al., 2021). Additionally, a large survey of 15–25-year-olds found that worry of infection was higher in Turkey compared to migrant and non-migrant Austrians (Akkaya-Kalayci et al., 2020). However, to our best of our knowledge we are not aware of studies which have compared worry of infection in caregivers and its impact on children's emotions and behaviour across cultures.

Families in several European countries (Italy, Spain, and Belgium; Orgilés et al., 2020; Stassart et al., 2021) and the UK (Morgül et al., 2020) struggled to cope with the co-existence imposed by the confinement. In the UK, the families who struggled most were more likely to report that their children's behaviour and emotional state had changed for the worse since the lockdown had started (Morgül et al., 2020). Currently, we do not have research on how caregivers in collectivist contexts cope with the prolonged coexistence that was brough upon them and whether they differed in their response from caregivers in individualist societies.

The present study

To understand better cultural influences on the impact of the COVID-19 pandemic and the lockdown on children's psychological outcomes we compared caregiver worry of infection and family co-existence difficulty between UK and Turkey and examined their effect on children's emotional states and behaviour. Because caregiver mental health (Brown et al., 2020; Li & Zhou, 2021; Saddik et al., 2021; Westrupp et al., 2021), parenting stress (Babore et al., 2021; Brown et al., 2020; Lee et al., 2021; Spinelli et al., 2021; Provenzi et al., 2021; Cohodes et al., 2021), child emotional and behavioural difficulties (Raw et al., 2021), and risk of infection (Yıldırım et al., 2021; Yıldırım & Güler, 2021; 2020; Xin et al., 2020; Kim et al., 2020; Zhou et al., 2020) have been consistently associated with poor social and emotional wellbeing during the lockdown across different countries, the examination accounted for their associated effects.

Methods

Participants and Procedures

Participant characteristics are presented in Table 1. A total of 1849 caregivers between 18 to 61 years old participated in the present study of which 995 were living in the UK (Mage = 39.16 years, SD = 5.62) and 854 in Turkey (Mage = 38.25 years, SD = 4.73). In the UK sample, caregivers were mostly of White ethnic
background (91.9%), and in the Turkish sample of Turkish ethnic background (90.4%). Across both samples most caregivers were married (n_{uk}=738, 74.2%; n_{tr}=811, 95.0%), in employment (n_{uk}=724, 72.8%; n_{tr}=496, 58.1%), and had at least a university degree (n_{uk}=760, 76.4%; n_{tr}=665, 77.9%). Children were (n_{boys,uk}= 546, 54.9%; n_{boys,tr}= 423, 49.5%) between 5 to 12 years old (M_{age,uk} = 7.48 years; SD=2.05; M_{age,tr} = 7.86 years; SD=2.24). In the Turkish sample, most children were attending independent schools (49.1%) whereas in the UK sample the majority was attending state schools (89.5%). Using snow-ball sampling, caregivers in the UK and Turkey were invited to complete a 20-min electronic survey on child and family wellbeing distributed via social networks (e.g., Facebook, Instagram), e-mail, and messaging groups (e.g., Whatsapp) between the 14th of July 2020 and the 14th of August 2020. Survey development details can be found in Morgül et al. (2020). The study was approved by the University of Roehampton Research Ethics Committee (PSYC 20/367).

Measures

**Caregiver worry of infection and family coexistence difficulty:** A total infection worry score was calculated by adding all four items (range: 4 - 20). Internal reliability of the total infection worry scores for each sample was good (Cronbach's $\alpha = .87_{\text{UK}}; .91_{\text{TR}}$). Caregivers indicated how difficult co-existence was on a 5-point rating scale (1=very easy - 5=very difficult). Caregivers answered four questions about worry of getting infected (e.g., Have you ever worried about being infected with COVID-19 during the recent coronavirus outbreak period?) using a five-point rating scale (1 = never thought about it - 5 = worried about it all the time).

**Change in the child emotional state (internalising symptoms) and behaviour (externalising symptoms) before and during the lockdown:** Caregivers indicate how much they thought their children's emotional state and behaviour changed during the lockdown by rating 23 emotional and behavioural symptom items on a five-point scale (1 = much less compared to before quarantine; 2 = somewhat less compared to before quarantine; 3 = stayed the same; 4 = somewhat more compared to before quarantine; 5 = much more compared to before quarantine) (Morgül et al., 2020).

We used exploratory (EFA) and confirmatory factor analyses (CFA) in line with Worthington and Whittaker (2006) to create a total internalising and externalising score, to assess children's total emotional and behaviour change. Each sample was randomly divided into two equal sub-samples. For each sample, we tested the factor structure on the first sub-sample using EFA and then replicated the structure in the second sub-sample using CFA (n_{EFA,uk}= 507, n_{EFA,tr}= 438; n_{CFA,uk}= 488, n_{CFA,tr}= 416). EFA was conducted using a principal axis factoring analysis on the first sub-sample to investigate the underlying factor structure of the 23 items. In both countries, the Kaiser-Meyer-Olkin (KMO$_{UK} = .93$; KMO$_{TR} = .93$) measure of sampling adequacy was above the commonly recommended value of .60 and the Bartlett's test of sphericity was significant suggesting that the sample were appropriate for the factor analysis (Henson and Roberts, 2006). Preliminary correlation analysis showed that majority of the correlation coefficients of the items My child has no appetite, My child eats a lot, and My child is quiet were lower than the suggested minimum level of .30 (Table 2a & Table 2b) (Tabachnick & Fidell, 2007). Therefore, these three items were not used further in the analysis. The remaining 20 items were subjected to oblique promax rotation, since the factors were assumed to be correlated (Costello & Osborne, 2005). The items having factor loadings greater than .32 were retained in the factor structure (Tabachnick & Fidell, 2007; Worthington & Whittaker, 2005). Item communalities were above the accepted value of .40 (range .45 to .85) (Osborne et al., 2008). The number of retained factors was based the Kaiser's criterion (eigenvalues > 1.0) and inspection of the Cattell's scree test (Tabachnick & Fidell, 2007). The EFA revealed 11 items with high loadings across both factors (range .52 -.98) and samples explaining 69.2% and 68.6% of the total variance, in the UK and Turkey, respectively (Table 3). The high factor loadings, communalities, and sample size corroborate the robustness of the EFA (Osborne & Costello, 2004).

CIFA was conducted on the second sub-sample to identify the fit between our model based on the EFA results and the data of our second sub-sample. Various indices were used as standard measures of fit in CFA including the root mean squared error approximation (RMSEA), minimum discrepancy per degree of freedom (CMIN/DF), goodness-of-fit index (GFI), adjusted goodness-of-fit index (AGFI), normed fit index (NFI), the Tucker–Lewis Index (TLI) and comparative fit index (CFI). In general, threshold values of RMSEA less than .05 suggest “good” fit (Browne & Cudeck, 1992), values between .05 and .10 suggest “acceptable” fit (Browne & Cudeck, 1992; MacCallum et al., 1996), and values lower than .10 suggest “bad” fit (Browne & Cudeck, 1992). CMIN/DF < 3 indicates an "acceptable" fit between hypothetical model and sample data (Kline, 2015) and CMIN/DF<5 indicating a "reasonable" fit (Marsh & Hocevar, 1985). GFI, AGFI, NFI, TLI and CFI > .9 indicate "good" levels of fit between data and model with more liberal criteria of .85 < GFI, NFI < 9 and .8 < AGFI < .9 indicating an acceptable model (Bentler, 1990; Cole, 1987; Marsh et al., 1988). In the CFA, a two-factor model based on data from 11 items showed an acceptable model fit in both countries (UK Sample: CMIN/DF = 3.62, GFI = .95, AGFI = .92, NFI = .96, TLI = .96, CFI = .97, RMSEA = .07; TR Sample: CMIN/DF = 4.48, GFI = .92, AGFI = .88, NFI = .93, TLI = .93, CFI = .95, RMSEA = .09).

According to broadband dimensions of internalising and externalising difficulties in children and young people (Achenbach et al., 2016), items loaded in Factor 1 reflected externalising symptoms and items in Factor 2 reflected internalising symptoms (Table 2). Therefore, they were summed up to create a total change score in internalising (Cronbach's $\alpha = .88_{\text{UK}}; .90_{\text{TR}}$) and externalising symptoms (Cronbach’s $\alpha = .92_{\text{UK}}; .89_{\text{TR}}$) before and during the lockdown. To examine the proportion of children whose emotions and behaviours changed, a categorical variable was created based on the child’s score (no change score = 1-3; change = score 4 - 5).

**Covariates**

**Sociodemographic Information and Perceived COVID-19 Infection Risk:** The first part of the survey included children's and families' sociodemographic characteristics (e.g., participant age, marital status, education level, ethnicity and child age, gender, school type, and questions about housing conditions (e.g., outdoor access, number of rooms and number of people living in at home during quarantine). Finally, caregivers indicated their COVID-19 risk status on a single multiple-choice question of four options (1= low risk: I do not know anyone who belongs to a risk group or There are friends/family being at-risk group, but not living with them; 2= high risk: I belong to an at-risk group or People belonging to an at-risk group live with me).
Predictors of Perceived Change in Children’s Internalising and Externalising Symptoms Before and During the Lockdown by Country

Their children were more argumentative, angry, and irritable than before the quarantine (Table 4). Caregivers in Turkey to report change in children’s externalising behaviour, around one in two caregivers across both samples (range: 48% - 57%) reported that no significant differences across countries in the overall level of internalising behaviour change, except for children in the UK sample being more restless, and nearly one in two caregivers across both samples (range: 40% - 57%) reported significant change in children internalising behaviours. Nonetheless, there were high levels of internal consistency reliability were detected in both samples (Cronbach’s α = .88 unuk, .83 TR).

Translation of Instruments

The Turkish versions of the SDQ and DASS-21 are publicly available at https://www.sdqinfo.org/py/sdqinfo/b0.py and https://toad.hallekisi.net/olcek/depresyon-anksiyet-stres-21-olcegi, respectively. The remaining instruments were translated into Turkish from the original language (English) by the first author who is a native Turkish speaker and fluent in English, and they were checked for accuracy in meaning and cultural sensitivity by a translator who is a native English speaker and fluent in Turkish. Discrepancies were discussed and resolved by joint agreement of both translators.

Data Analysis

Statistical analyses were performed using the IBM SPSS 26 (Statistical Package for the Social Sciences) and AMOS 18 (Analysis of Moment Structures). Because of some item-level missing data in the PCEBQ (≤5% of values were missing across 23 items), multiple imputation was performed using the Markov Chain Monte Carlo procedure in SPSS (Graham, 2012). Imputation of missing values was only done for variables in the PCEBQ. A preliminary screening of the data revealed no issues with multicollinearity, outliers, and normality (Tabachnick & Fidell, 2007). No collinearity was detected via variance inflation factor (VIF < 5) (Becker et al., 2015). The outliers were tested, and no extreme values were identified, thereby no case was removed from the sample. To check for the assumptions of normality, skewness and kurtosis values were calculated for each of the variables of interest. Except for the kurtosis and skewness value of outdoor access, which is considered acceptable according to Hair et al. (2010) and Byrne (2010), none of the variables presented extreme skewness and kurtosis values falling outside the proposed threshold of ±2, suggesting a normal distribution for the variables of interest (George & Mallery, 2010).

To compare variables across samples we used one-way analysis of variance (ANOVA) and independent groups t-tests for continuous variables, and Chi-squared tests for categorical variables. Differences were considered statistically significant at p < .05. Pearson correlations were calculated to analyse the relationship between the study variables. Hierarchical multiple regression analyses were used to identify the psychosocial predictors of immediate changes in children’s externalising and internalising symptoms during the lockdown across both samples.

Results

Between-country Differences in Participant Characteristics

Differences are presented in Table 1. Compared to the caregivers in the Turkish sample, caregivers in the UK sample were older, and more likely to have a job, be lone/never married, belong to a small household (1-2 members), and live in houses with fewer rooms. No significant differences were found in level of education. Compared to children in the Turkish sample, children in the UK sample were older, more likely to be boys, and attend state schools. Children in the UK sample were more likely to experience behaviour and emotional difficulties than children in the Turkish sample. Additionally, caregivers in the UK sample reported more stress related to their parenting role. Caregivers in the Turkish sample were more likely to belong to a high-risk group for COVID-19 infection and worry about getting infected, but less likely to have trouble with co-existence than caregivers in the UK sample. The proportion of caregivers who were married and had a higher education in the study samples was higher than in the national population. The Turkish sample had a higher proportion of caregivers in employment and whose children attended private schools than the national population.

Nearly one in two caregivers across both samples (range: 40% - 57%) reported significant change in children internalising behaviours. Nonetheless, there were no significant differences across countries in the overall level of internalising behaviour change, except for children in the UK sample being more restless, and children in the Turkish sample being more anxious than before the quarantine (Table 4). Although caregivers in UK were overall slightly more likely than caregivers in Turkey to report change in children’s externalising behaviour, around one in two caregivers across both samples (range: 48% - 57%) reported that their children were more argumentative, angry, and irritable than before the quarantine (Table 4).

Predictors of Perceived Change in Children’s Internalising and Externalising Symptoms Before and During the Lockdown by Country

The analysis showed significant and consistent correlates of psychological change across both samples with the following variables (Table 5). Increased change in internalising and externalising behaviour was associated with increased levels of family co-existence difficulty (Int: tUK = .40, tTR = .24; Ext: tUK = .44, tTR = .30), child emotional and behavioural difficulties (Int: tUK = .41; tTR = .26; Ext: tUK = .46, tTR = .31), caregiver mental health (Int: tUK = .25, tTR = .19; Ext: tUK = .36, tTR = .23) and parenting stress (Int: tUK = .26, tTR = .12; Ext: tUK = .35, tTR = .25).
The analysis showed significant but weak correlates of change in child internalising and externalising behaviour which were country specific. In the UK sample, more change in both internalising and externalising behaviour was associated with no higher education ($r_{\text{UK}} = -.12$, $r_{\text{Ext}} = .10$) and ethnic minority background ($r_{\text{Int}} = .07$, $r_{\text{Ext}} = .09$). Additionally, externalising behaviour was associated with caregiver lone/never married ($r_{\text{UK}} = -.07$) and caregiver young age ($r_{\text{UK}} = -.07$). In the Turkish sample, more change in both internalising and externalising behaviour was associated with older age in children ($r_{\text{TR}} = .10$), more change in internalising behaviour was associated with higher infection worry ($r_{\text{TR}} = .10$), and more change in externalising behaviour with lack of outdoor access ($r_{\text{TR}} = -.07$).

To identify the impact of coexistence and worry of infection on children's internalising and externalising behaviour during the lockdown two hierarchical multiple regressions were conducted for each sample. Variables were included in the regressions if they were significantly associated (Table 5) with either type of symptom change in either country. Because employment status, child gender, household number of rooms and members were not significantly associated with either type of symptom in any country, they were not included in the regressions. We entered the sociodemographic variables in the first step, caregiver mental health and parenting stress variables in the second step, child emotional and behavioural difficulties in the third step, and caregiver response to COVID-19 pandemic variables in the fourth step.

Table 6 presents the results of the contribution of worry of infection and coexistence difficulty to children's internalising behaviour change score before and during the lockdown across the two samples. Sociodemographic variables including infection risk (Step 1) explained a very small proportion of the variance (UK: 2.0%; TR: 2.0%) across both samples. Caregiver mental health (Step 2) explained 10% and 6% of the variance in the UK and Turkish sample, respectively, even after controlling for the effects of sociodemographic variables and infection risk. Child behavioural and emotional difficulties (Step 3) explained 17% and 7% of the variance in the UK and Turkish sample, respectively, even after controlling for the effects of sociodemographic variables and infection risk, caregiver mental health and parenting stress. Higher parenting-related stress was a significant predictor only in the UK sample. In the fourth step, more family co-existence difficulty predicted more change in internalising symptoms across both samples even after controlling for sociodemographic variables, child and caregiver mental health, and parenting stress. Higher worry of infection was a significant predictor only in the Turkish sample, even after controlling for the effects of perceived infection risk. The final model explained 23% and 11% of the variance in the UK and Turkish sample, respectively.

Table 7 presents the contribution of worry of infection and family coexistence in children's externalising behaviour change score across the two samples. Sociodemographic variables (Step 1) explained a small proportion (2%) of the variance in the UK sample, whereas it did not significantly contribute to the TR sample. In the second step, higher caregiver mental health and parenting stress significantly predicted more change in children's externalising symptoms across both samples and explained 16% and 8% of the variance in the UK and Turkish sample, respectively, even after controlling for the effects of sociodemographic variables. In the third step, higher child social and emotional difficulties significantly predicted more change in children's externalising symptoms across both samples and explained 23% and 12% of the variance in the UK and Turkish sample, respectively, even after controlling for the effects of sociodemographic variables, caregiver mental health and parenting stress. In the fourth step, more family co-existence difficulty predicted more change across both samples even after controlling for sociodemographic variables, child and caregiver mental health, and parenting stress. The final model explained 29% and 16% of the variance in the UK and Turkish sample, respectively.

**Discussion**

Nearly half of the parents across both samples reported that the children's internalising and externalising behaviour changed significantly during the lockdown. This finding is in line with international literature which showed that children's mental health and wellbeing got significantly worse during the lockdown (Christner et al., 2021; Feinberg et al., 2021). The children in the UK sample were overall slightly more impacted as their externalising mean score was somewhat higher, and more caregivers in the UK than in Turkey reported change across all externalising symptoms. Previous research on the prevalence of childhood mental health problems across countries in Europe found that behaviour problems were less likely to be reported in Turkey (Husky et al., 2018; Kovess-Masfety, 2016). Hence, the differences may reflect genuine prevalence rates. Nevertheless, the range of the percentage of parents reporting change in how much children were irritable, argumentative, and angry was reflecting approximately one in two caregivers across both samples. This finding shows that the behaviours that were a major cause of concern for caregivers during the lockdown across both cultures were the same and suggest that culture did not influence the type of challenging behaviour caregivers had to grapple with during the lockdown. Although, frustration as an emotional response to the lockdown has been reported often in western and non-western samples (Fernandez Ruiz, 2021; Tiwari et al., 2021) the proportion of caregivers who reported frustration in the UK sample was double the proportion of Turkish caregivers. The difference could reflect differences in the conceptual understanding of the term 'frustration', but further research is required to verify this assumption.

Worry of COVID-19 infection was an independent predictor of children's internalising behaviour change before and during the lockdown in the Turkish sample. To our knowledge, our study is the first to reveal an association between worry of COVID-19 infection and change in children's outcomes during the pandemic. Previous research by Hofstede et al., (2005) has linked collectivism with less tolerance to uncertainty. Combined with the uncertainty created by the fast spread of the infection and public handling of the crisis during the initial period of the pandemic in Turkey (Pak et al., 2021; San et al., 2021) caregivers in Turkey may have experienced higher levels of worry of COVID-19 infection than in the UK. Together with research that shows that worry of COVID-19 infection is related to poor psychological wellbeing (Fitzpatrick et al., 2020; Kayis et al., 2021; Satici et al., 2020a) our findings propose that public health strategies should aim to reduce worry and social panic in the face of imminent crisis. In line with Huang et al., (2020) collectivism on its own is enough to encourage uptake of preventive practices as high worry of COVID-19 infection may even reduce preventive behaviour.

Caregivers in the Turkish sample reported significantly less difficulty with the confinement which can be attributed to its collectivist orientation that values interdependence and close-knit family ties (Kuşdil & Kağıtçobaşı, 2000). Because interdependence in the family unit cultivates a sense of belongingness and purpose (Hofstede, 2001) spending time with the family during the lockdown may have not influenced families in collectivist societies as dramatically as in individualistic societies. Additionally, because collectivism promotes a strong sense of responsibility for the community and maintenance of social order it
encourages high adherence to prevention measures (Cukur et al., 2004; Germani et al., 2020; Huang et al., 2020; Maaravi et al., 2021). The lockdown was one of the many measures that countries imposed to mitigate the spread of the virus. Families in collectivist cultures may have perceived the confinement yet another prevention strategy to adhere to and as a result were more tolerant to its impact. Finally, collectivist child socialisation goals aim to promote obedience (Louie et al., 2015) may translate to more manageable child behaviour. Indeed, the rates of externalising behaviour were lower in the Turkish sample. Nevertheless, it made a unique contribution to the prediction of change in internalising and externalising behaviour change across both the Turkish and UK sample suggesting that collectivism may not buffer the harmful effects of the confinement.

On a final note, although it was not an aim of our study, we found that parenting stress predicted internalising difficulties in the UK sample only. Parenting stress during the pandemic was associated with a range of social and emotional symptoms in a cross-sectional study of a large sample of caregivers in Turkey (Büber & Terzioglu, 2021). However, an earlier study of Turkish pre-schoolers found weak direct and indirect effects of parenting stress on internalising symptoms (Yavuz et al., 2017). The differential impact of parenting stress could be explained by cultural differences. Collectivist culture prioritises group over individual harmony and child socialisation goals tend to promote restrain and inhibition (Chen-Bouck et al., 2019; Louie et al., 2015). Therefore, within a collectivist context, internalising behaviour as a response to the stresses of the lockdown could have been potentially perceived as adaptive and by extension acceptable if it reflects social sensitivity and the dominant public emotional response. In this context, caregivers in Turkey may have not felt that they were burdened by the demands of parenting a child with internalising behaviour. However, more research is required to validate this hypothesis.

Limitations

The cross-sectional design did not allow to examine the long-term impact of the quarantine in children’s internalising and externalising behaviour change. Additionally, changes in children’s symptoms were based only on perceived parental report. Majority of participants were female university graduates. Additionally, half of the Turkish children were primarily attending private schools, which is not representative of the national population. Therefore, generalisation of the findings should be approached with caution. The study did not use any measures to examine collectivism vs individualism, and tolerance of uncertainty. Replication studies should include a longitudinal design, multi-informant methods of assessing children’s emotional stated and behaviour and measures that capture cultural orientation.

Declarations

Conflict of interest: the authors report not conflict of interest

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References

Achenbach, T. M., Ivanova, M. Y., Rescorla, L. A., Turner, L. V., & Althoff, R. R. (2016). Internalizing/externalizing problems: Review and recommendations for clinical and research applications. *Journal of the American Academy of Child & Adolescent Psychiatry, 55*(8), 647–656.

Adibelli, D., & Sümen, A. (2020). The effect of the coronavirus (COVID-19) pandemic on health-related quality of life in children. *Children and Youth Services Review, 119*, 105595.

Akkaya-Kalayci, T., Kothgassner, O. D., Wenzel, T., Goreis, A., Chen, A., Ceri, V., & Özlü-Erkilic, Z. (2020). The impact of the COVID-19 pandemic on mental health and psychological well-being of young people living in Austria and Turkey: a multicenter study. *International Journal of Environmental Research and Public Health, 17*(23), 9111.

Babore, A., Trumello, C., Lombardi, L., Candelori, C., Chirumbolo, A., Cattelino, E., … Morelli, M. (2021). Mothers’ and Children’s Mental Health During the COVID-19 Pandemic Lockdown: The Mediating Role of Parenting Stress. *Child Psychiatry & Human Development, 1–13.*

Becker, J. M., Ringle, C. M., Sarstedt, M., & Vöckner, F. (2015). How collinearity affects mixture regression results. *Marketing Letters, 26*(4), 643–659.

Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychological bulletin, 107*(2), 238.

Berry, J. O., & Jones, W. H. (1995). Parental Stress Scale (PSS).

Brown, S. M., Doom, J. R., Lechuga-Peña, S., Watamura, S. E., & Koppels, T. (2020). Stress and parenting during the global COVID-19 pandemic. *Child abuse & neglect, 110*, 104699.

Browne, M. W., & Cudeck, R. (1992). Alternative ways of assessing model fit. *Sociological methods & research, 21*(2), 230–258.

Burkova, V. N., Butovskaya, M. L., Randall, A. K., Fedenok, J. N., Ahmadi, K., Alghraibeh, A. M., … Zinurova, R. I. (2021). Predictors of anxiety in the COVID-19 pandemic from a global perspective: Data from 23 countries. *Sustainability, 13*(7), 4017.

Büber, A., & Akta Terzioglu, M. (2021). Caregiver's reports of their children's psychological symptoms after the start of the COVID-19 pandemic and caregiver's perceived stress in Turkey. *Nordic Journal of Psychiatry, 1–10.*

Byrne, B. M. (2010). *Structural Equation Modeling with AMOS.* New York: Routledge Taylor & Francis Group.
Chen-Bouck, L., Patterson, M. M., & Chen, J. (2019). Relations of collectivism socialization goals and training beliefs to Chinese parenting. *Journal of Cross-Cultural Psychology, 50*(3), 396–418.

Christner, N., Essler, S., Hazzam, A., & Paulus, M. (2021). Children's psychological well-being and problem behavior during the COVID-19 pandemic: An online study during the lockdown period in Germany. *PLOS ONE, 16*(6), e0253473.

Cohodes, E. M., McCauley, S., & Gee, D. G. (2021). Parental buffering of stress in the time of COVID-19: family-level factors may moderate the association between pandemic-related stress and youth symptomatology. *Research on Child and Adolescent Psychopathology, 1–14.*

Cole, D. A. (1987). Utility of confirmatory factor analysis in test validation research. *Journal of consulting and clinical psychology, 55*(4), 584.

Costello, A. B., & Osborne, J. (2005). Best practices in exploratory factor analysis: Four recommendations for getting the most from your analysis. *Practical assessment, research, and evaluation, 10*(1), 7.

Creswell, C., Shum, A., Pearcey, S., Skripkauskaite, S., Patalay, P., & Waite, P. (2021). Young people's mental health during the COVID-19 pandemic. *The Lancet Child & Adolescent Health, 5*(8), 535–537.

Cukur, C. S., De Guzman, M. R. T., & Carlo, G. (2004). Religiosity, values, and horizontal and vertical individualism—Collectivism: A study of Turkey, the United States, and the Philippines. *The Journal of social psychology, 144*(6), 613–634.

Feinberg, M. E., A Mogle, J., Lee, J. K., Tornello, S. L., Hostetler, M. L., Cifelli, J. A., ... Hotez, E. (2021). Impact of the COVID-19 Pandemic on Parent, Child, and Family Functioning. *Family Process.*

Fernandez Ruiz, M. R. (2021). Pandemic natives, pandemic immigrants: Effects of COVID-19 confinement on the wellbeing of children in preschool education. *European Early Childhood Education Research Journal, 1–13.*

Fitzpatrick, K. M., Harris, C., & Drawwe, G. (2020). Fear of COVID-19 and the mental health consequences in America. *Psychological trauma: theory, research, practice, and policy, 12*(S1), S17.

Germani, A., Buratta, L., Delvecchio, E., Gizi, G., & Mazzeschi, C. (2020). Anxiety severity, perceived risk of COVID-19 and individual functioning in emerging adults facing the pandemic. *Frontiers in Psychology, 11.*

Goodman, R. (2001). Psychometric properties of the strengths and difficulties questionnaire. *Journal of the American Academy of Child & Adolescent Psychiatry, 40*(11), 1337–1345.

Henson, R. K., & Roberts, J. K. (2006). Use of exploratory factor analysis in published research: Common errors and some comment on improved practice. *Educational and Psychological measurement, 66*(3), 393–416.

Hofstede, G. (2001). *Culture’s consequences: Comparing values, behaviours, institutions and organizations across nations.* Sage publications.

Hofstede, G., Hofstede, G. J., & Minkov, M. (2005). *Cultures and organizations: Software of the mind* (2). New York: McGraw-Hill.

Huang, F., Ding, H., Liu, Z., Wu, P., Zhu, M., Li, A., & Zhu, T. (2020). How fear and collectivism influence public's preventive intention towards COVID-19 infection: a study based on big data from the social media. *BMC Public Health, 20*(1), 1–9.

Husky, M. M., Boyd, A., Bitfoi, A., Carta, M. G., Chan-Chee, C., Goelitz, D., ... Kovess-Masfety, V. (2018). Self-reported mental health in children ages 6–12 years across eight European countries. *European child & adolescent psychiatry, 27*(6), 785–795.

Kayis, A. R., Satici, B., Deniz, M. E., Satici, S. A., & Griffiths, M. D. (2021). Fear of COVID-19, loneliness, smartphone addiction, and mental wellbeing among the Turkish general population: a serial mediation model. *Behaviour & Information Technology, 1–13.*

Kim, A. W., Nyengerai, T., & Mendenhall, E. (2020). Evaluating the mental health impacts of the COVID-19 pandemic: perceived risk of COVID-19 infection and childhood trauma predict adult depressive symptoms in urban South Africa. *Psychological Medicine, 1–13.*

Kline, R. B. (2015). *Principles and practice of structural equation modeling.* Guilford publications.
Kovess-Masfety, V., Husky, M. M., Keyes, K., Hamilton, A., Pez, O., Bitfoi, A., ... Mihova, Z. (2016). Comparing the prevalence of mental health problems in children 6–11 across Europe. *Social psychiatry and psychiatric epidemiology, 51*(8), 1093–1103.

Kuşçcl, M. E., & Kağıtçibaş, Ç. (2000). Value orientations of Turkish teachers and Schwartz’ theory of values. *Türk Psikoloji Dergisi, 15*, 59–80.

Lee, S. A., Jobe, M. C., & Mathis, A. A. (2021). Mental health characteristics associated with dysfunctional coronavirus anxiety. *Psychological medicine, 51*(8), 1403–1404.

Li, X., & Zhou, S. (2021). Parental worry, family-based disaster education and children's internalizing and externalizing problems during the COVID-19 pandemic. *Psychological trauma: theory, research, practice, and policy."

Loure, J. Y., Wang, S. W., Fung, J., & Lau, A. (2015). Children's emotional expressivity and teacher perceptions of social competence: A cross-cultural comparison. *International Journal of Behavioral Development, 39*(6), 497–507.

Lovibond, P. F., & Lovibond, S. H. (1995). The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behaviour research and therapy, 33*(3), 335–343.

Maaravi, Y., Levy, A., Gur, T., Confino, D., & Segal, S. (2021). "The tragedy of the commons": How individualism and collectivism affected the spread of the COVID-19 pandemic. *Frontiers in Public Health, 9*, 37.

MacCallum, R. C., Browne, M. W., & Sugawara, H. M. (1996). Power analysis and determination of sample size for covariance structure modeling. *Psychological methods, 1*(2), 130.

Mahmud, S., Mohsin, M., Khan, I. A., Mian, A. U., & Zaman, M. A. (2021). Knowledge, beliefs, attitudes and perceived risk about COVID-19 vaccine and determinants of COVID-19 vaccine acceptance in Bangladesh. *PloS one, 16*(9), e0257096.

Marsh, H. W., & Hocevar, D. (1985). Application of confirmatory factor analysis to the study of self-concept: First-and higher order factor models and their invariance across groups. *Psychological bulletin, 97*(3), 562.

Marsh, H. W., Balla, J. R., & McDonald, R. P. (1988). Goodness-of-fit indexes in confirmatory factor analysis: The effect of sample size. *Psychological bulletin, 103*(3), 391.

Melis Yavuz, H., Selcuk, B., Corapci, F., & Aksan, N. (2017). Role of temperament, parenting behaviors, and stress on Turkish preschoolers' internalizing symptoms. *Social Development, 26*(1), 109–128.

Morgül, E., Kalitšsoglou, A., & Essau, C. A. E. (2020). Psychological effects of the COVID-19 lockdown on children and families in the UK. *Revista de Psicología Clínica con Niños y Adolescentes, 7*(3), 42–48.

Motta Zanin, G., Gentile, E., Parisi, A., & Spasiano, D. (2020). A preliminary evaluation of the public risk perception related to the COVID-19 health emergency in Italy. *International journal of environmental research and public health, 17*(9), 3024.

Nabi, R. L., & Myrick, J. G. (2019). Uplifting fear appeals: Considering the role of hope in fear-based persuasive messages. *Health Communication, 34*(4), 463–474.

Orgilés, M., Morales, A., Delvecchio, E., Mazzeschi, C., & Espada, J. P. (2020). Immediate psychological effects of the COVID-19 quarantine in youth from Italy and Spain. *Frontiers in Psychology, 11*, 2986.

Osborne, J. W., & Costello, A. B. (2004). Sample size and subject to item ratio in principal components analysis. *Practical Assessment, Research, and Evaluation, 9*(1), 11.

Osborne, J. W., Costello, A. B., & Kellow, J. T. (2008). Exploratory factor analysis (EFA) is rightly described as both an art and a science, whereresearchers follow a series of ana-lytic steps involving judgments more reminiscent of qualitative inquiry, an interesting irony given the mathematical sophistication underlying EFA models'. *Best Practices in Quantitative Methods, 86*.

Pak, H., Süsen, Y., Nazlıgül, M. D., & Griffiths, M. (2021). The Mediating Effects of Fear of COVID-19 and depression on the association between intolerance of uncertainty and emotional eating during the COVID-19 Pandemic in Turkey. *International Journal of Mental Health and Addiction, 1*, 1–15.

Panchal, U., Salazar de Pablo, G., Franco, M., Moreno, C., Parrallada, M., Arango, C., & Fusar-Poli, P. (2021). The impact of COVID-19 lockdown on child and adolescent mental health: Systematic review. *European child & adolescent psychiatry, 1–27.*

Prime, H., Wade, M., & Browne, D. T. (2020). Risk and resilience in family well-being during the COVID-19 pandemic. *American Psychologist, 75*(5), 631.

Provenzi, L., Grumi, S., Altieri, L., Bensi, G., Bertazzoli, E., Biasucci, G., ... MOM-COPE Study Group. (2021). Prenatal maternal stress during the COVID-19 pandemic and infant regulatory capacity at 3 months: A longitudinal study. *Development and Psychopathology, 1–9.*

Raw, J., Waite, P., Pearcey, S., Shum, A., Patalay, P. & Creswell, C. (2021). Examining changes in parent-reported child and adolescent mental health throughout the UK’s first COVID-19 national lockdown. *Journal of Child & Adolescent Psychiatry, 62*(12), 1391–1401.
Saddik, B., Hussein, A., Albanna, A., Elbarazi, I., Al-Shujairi, A., Temsah, M. H., … Halwani, R. (2021). The psychological impact of the COVID-19 pandemic on adults and children in the United Arab Emirates: a nationwide cross-sectional study. *BMC psychiatry*, 21(1), 1–18.

San, S., Bastug, M. F., & Basli, H. (2021). Crisis management in authoritarian regimes: A comparative study of COVID-19 responses in Turkey and Iran. *Global Public Health*, 16(4), 485–501.

Satici, B., Gocet-Tekin, E., Deniz, M. E., & Satici, S. A. (2020a). Adaptation of the Fear of COVID-19 Scale: Its association with psychological distress and life satisfaction in Turkey. *International journal of mental health and addiction*, 1–9.

Satici, B., Saricali, M., Satici, S. A., & Griffiths, M. D. (2020b). Intolerance of uncertainty and mental wellbeing: serial mediation by rumination and fear of COVID-19. *International journal of mental health and addiction*, 1.

Spinelli, M., Lionetti, F., Setti, A., & Fasolo, M. (2020). Parenting Stress During the COVID-19 Outbreak: Socioeconomic and Environmental Risk Factors and Implications for Children Emotion Regulation. *Family process*.

Stassart, C., Wagener, A., & Etienne, A. M. (2021). Parents' Perceived Impact of the Societal Lockdown of COVID-19 on Family Well-Being and on the Emotional and Behavioural State of Walloon Belgian Children Aged 4 to 13 Years: An Exploratory Study. *Psychologica Belgica*, 61(1), 186.

Tabachnick, B. G., Fidell, L. S., & Ullman, J. B. (2007). *Using multivariate statistics* (Vol. 5, pp. 481–498). Boston, MA: Pearson.

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.

Tiwari, G. K., Singh, A. K., Parihar, P., Pandey, R., Sharma, D. N., & Rai, P. K. (2021). Understanding the perceived psychological distress and health outcomes of children during COVID-19 pandemic. *The Educational and Developmental Psychologist*, 1–12.

Westrupp, E. M., Stokes, M. A., Fuller-Tyszkiewicz, M., Berkowitz, T. S., Capic, T., Khor, S., … Hutchinson, D. (2021). Subjective wellbeing in parents during the COVID-19 pandemic in Australia. *Journal of Psychosomatic Research*, 145, 110482.

Wise, T., Zbozinek, T. D., Michelini, G., Hagan, C. C., & Mobbs, D. (2020). Changes in risk perception and self-reported protective behaviour during the first week of the COVID-19 pandemic in the United States. *Royal Society open science*, 7(9), 200742.

Witte, K., & Allen, M. (2000). A meta-analysis of fear appeals: Implications for effective public health campaigns. *Health education & behavior*, 27(5), 591–615.

Worldometer. (2020). Total Coronavirus Cases in the World. Retrieved from: https://www.worldometers.info/coronavirus/

Worthington, R. L., & Whittaker, T. A. (2006). Scale development research: A content analysis and recommendations for best practices. *The counselling psychologist*, 34(6), 806–838.

Xin, M., Luo, S., She, R., Yu, Y., Li, L., Wang, S., … Lau, J. T. F. (2020). Negative cognitive and psychological correlates of mandatory quarantine during the initial COVID-19 outbreak in China. *American Psychologist*, 75(5), 607.

Yıldırım, M., & Güler, A. (2021). Positivity explains how COVID-19 perceived risk increases death distress and reduces happiness. *Personality and Individual Differences*, 168, 110347.

Yıldırım, M., Geçer, E., & Akgül, Ö. (2021). The impacts of vulnerability, perceived risk, and fear on preventive behaviours against COVID-19. *Psychology, health & medicine*, 26(1), 35–43.

Zhou, Y., MacGeorge, E. L., & Myrick, J. G. (2020). Mental health and its predictors during the early months of the COVID-19 pandemic experience in the United States. *International journal of environmental research and public health*, 17(17), 6315.

**Tables**

**Table 1**

*Between-country Differences by Participant Characteristics*
### Sociodemographics

|                          | UK (n=995) | Turkey (n=854) | Test | National Statistics\(^{1}\) |
|--------------------------|------------|----------------|------|-----------------------------|
| Mother\(^{a}\)           | 982 (98.7) | 848 (99.3)     | 1.65 |                             |
| Married \(^{b}\)         | 738 (74.2) | 811 (95.0)     | 146.19** | 50.2 | 75.5                       |
| Higher education \(^{c}\) | 760 (76.4) | 665 (77.9)     | .28  | 42  | 43.4                       |
| In employment \(^{d}\)   | 724 (72.8) | 496 (58.1)     | 24.05** | 75.2 | 45.8                       |
| Boys                     | 546 (54.9) | 423 (49.5)     | 5.33* | 75.2 | 45.8                       |
| State School \(^{e}\)    | 891 (89.5) | 403 (47.2)     | 405.6*** | 91 | 94.8                       |

### Housing Conditions

|                          | f (%)     | f (%)     | \(\chi^2\) |
|--------------------------|-----------|-----------|-------------|
| Small family \(^{f}\)   | 57 (5.7)  | 17 (2.0)  | 29.23***    |
| Few rooms \(^{g}\)      | 54 (5.4)  | 9 (1.1)   | 222.73***   |
| Outdoor access \(^{h}\) | 914 (91.9)| 777 (91.0)| .45         |

### Mental health and wellbeing

|                          | f (%)     | f (%)     | \(\chi^2\) |
|--------------------------|-----------|-----------|-------------|
| Caregiver mental health (DASS) | 15.00 (11.84) | 15.63 (10.29) | -1.22       |
| Parenting stress (PSS)    | 42.71 (10.1)| 40.17 (8.8) | 5.80***     |
| Strengths and difficulties (SDQ) | 12.87 (7.2) | 10.92 (5.2) | 6.75***     |

### Response to COVID-19 and infection risk

|                          | f (%)     | f (%)     | \(\chi^2\) |
|--------------------------|-----------|-----------|-------------|
| Co-existence difficulty  | 3.19 (1.1) | 2.93 (1.2) | 4.97***     |
| Infection worry          | 12.11 (3.3)| 13.90 (3.1)| 11.83***    |
| Low infection risk group \(^{i}\) | 798 (80.2) | 637 (74.6) | 8.33**      |

**Note:**

\(^{a}\) Mother/Father vs caregiver/step-parent.

\(^{b}\) Married vs widowed/divorced/separated/never married.

\(^{c}\) No qualifications vs non-higher education (up to high school at 16 years and college education) or higher education/postgraduate.

\(^{d}\) In employment vs not in employment/lost job due to COVID-19

\(^{e}\) State school vs independent school

\(^{f}\) Small family (1 or 2 members) vs medium (3 or 4 members) or large (more than 5 members)

\(^{g}\) Fewer rooms (1 or 2 rooms) vs average (3 or 4 rooms) or more (equal or more than 5 rooms)

\(^{h}\) Outdoor access vs. no outdoor access

\(^{i}\) Low-risk (not know anyone at risk/household member not at risk) vs high-risk (I am at risk/member of household at risk).

\(^{1}\) UK stats: https://www.ons.gov.uk/; Turkish stats: https://www.tuik.gov.tr/Home/Index

\(^{*}\) \(p < .05\), \(^{**}\) \(p < .01\), \(^{***}\) \(p < .001\).
**Table 2b**

Correlations Between the Internalising and Externalising Symptom Items in the Turkish Sample

|          | 1     | 2     | 3     | 4     | 5     | 6     | 7     | 8     | 9     | 10    | 11    | 12    | 13    | 14    | 15    | 16    | 17    |
|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1. Worried |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| 2. Restless | .51** |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| 3. Anxious  | .69** | .62** |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| 4. Sad      | .50** | .53** | .62** |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| 5. Nightmares| .29** | .29** | .39** | .41** |       |       |       |       |       |       |       |       |       |       |       |       |       |
| 6. Reluctant| .39** | .47** | .48** | .53** | .33** |       |       |       |       |       |       |       |       |       |       |       |       |
| 7. Lonely   | .35** | .45** | .45** | .52** | .31** | .46** |       |       |       |       |       |       |       |       |       |       |       |
| 8. Uneasy   | .52** | .57** | .66** | .59** | .40** | .59** | .55** |       |       |       |       |       |       |       |       |       |       |
| 9. Nervous  | .55** | .48** | .70** | .56** | .41** | .53** | .49** | .76** |       |       |       |       |       |       |       |       |       |
| 10. Argue   | .38** | .49** | .46** | .50** | .26** | .51** | .42** | .54** | .48** |       |       |       |       |       |       |       |       |
| 11. Quiet   | .19** | .21** | .26** | .28** | .26** | .31** | .24** | .30** | .32** | .16** |       |       |       |       |       |       |       |
| 12. Cries easily | .38** | .43** | .45** | .51** | .32** | .43** | .39** | .54** | .51** | .52** | .28** |       |       |       |       |       |       |
| 13. Angry   | .44** | .53** | .52** | .53** | .33** | .50** | .42** | .58** | .51** | .75** | .19** | .63** |       |       |       |       |       |
| 14. Frustrated | .48** | .56** | .56** | .57** | .35** | .54** | .45** | .62** | .55** | .67** | .23** | .62** | .80** |       |       |       |       |
| 15. Bored   | .34** | .44** | .38** | .45** | .21** | .42** | .50** | .46** | .40** | .50** | .22** | .41** | .46** | .51** |       |       |       |
| 16. Irritable | .44** | .57** | .52** | .57** | .32** | .54** | .45** | .59** | .50** | .71** | .22** | .59** | .75** | .75** | .59** |       |       |
| 17. No appetite | .07* | .04  | .08* | .08* | .05  | .03  | .05  | .10** | .12** | -.01 | .19** | .07* | .07* | .06  | .06  | .06  | .07* |
| 18. Concent. diff. | .34** | .40** | .38** | .41** | .22** | .48** | .35** | .44** | .43** | .43** | .23** | .40** | .45** | .49** | .45** | .53** | .13** |
| 19. Afraid infect. | .46** | .23** | .44** | .31** | .22** | .23** | .28** | .36** | .41** | .19** | .18** | .26** | .26** | .26** | .22** | .22** | .12** |
| 20. Dependent | .35** | .35** | .40** | .33** | .28** | .33** | .32** | .40** | .42** | .30** | .19** | .37** | .37** | .39** | .31** | .38** | .11** |
| 21. Behavior. diff. | .34** | .47** | .46** | .43** | .32** | .43** | .35** | .51** | .46** | .55** | .21** | .48** | .61** | .58** | .39** | .60** | .09** |
| 22. Eats a lot | .02 | .08* | .08* | .08* | .06* | .11** | .08* | .11** | .10** | .16** | -.03 | .16** | .14** | .14** | .14** | .11** | -.39** |
| 23. Worry if we leave home | .30** | .25** | .36** | .24** | .32** | .23** | .19** | .32** | .37** | .21** | .17** | .29** | .29** | .28** | .14** | .25** | .07* |

*p < .05; **p < .01.
|   | Worried | Restless | Anxious | Sad | Nightmares | Reluctant | Lonely | Uneasy | Nervous | Argue | Quiet | Cries | No appetite | Concent. diff. | Afraid infect. | Dependent | Behavior, diff. | Eats a lot | Worry if we leave home |
|---|---------|----------|---------|-----|-----------|----------|--------|-------|--------|-------|-------|-------|------------|----------------|---------------|-----------|-------------|----------|-------------------|
| 1 | -       | .77**    | -       |     | -         | -        | .66**  | .63** | .60**  | .32** | .34** | .30** | .34**       | -.77**         | .66**         | .63**    | .60**       | .32**    | .34**          |
| 2 | .66**   | .71**    | -       | .77**| -         | -        | .60**  | .63** | .60**  | .34** | .48** | .77** | .71**       | -.77**         | .60**         | .63**    | .60**       | .34**    | .48**          |
| 3 | .60**   | .63**    | .60**   | .66**| .34**    | .49**    | .49**  | .44** | .44**  | .42** | .46** | .46** | .67**       | -.34**         | .44**         | .44**    | .44**       | .42**    | .46**          |
| 4 | .32**   | .34**    | .30**   | .34**| -.77**   | .42**    | .42**  | .44** | .44**  | .42** | .46** | .67** | -          | -.34**         | .44**         | .44**    | .44**       | .42**    | .46**          |
| 5 | .34**   | .37**    | .34**   | .34**| .34**    | .51**    | .51**  | .51** | .51**  | .42** | .46** | .67** | -          | -.34**         | .51**         | .51**    | .51**       | .42**    | .46**          |
| 6 | .69**   | .63**    | .62**   | .58**| .39**    | .56**    | .56**  | .59** | .59**  | .42** | .49** | .67** | -          | -.69**        | .56**         | .56**    | .59**       | .42**    | .49**          |
| 7 | .58**   | .60**    | .55**   | .60**| .43**    | .58**    | .58**  | .51** | .51**  | .49** | .48** | .65** | -          | -.58**        | .58**         | .58**    | .51**       | .49**    | .48**          |
| 8 | .43**   | .43**    | .37**   | .47**| .34**    | .51**    | .51**  | .42** | .42**  | .46** | .67** | -     | -          | -.43**        | .51**         | .51**    | .42**       | .46**    | .67**          |
| 9 | .43**   | .43**    | .37**   | .47**| .34**    | .51**    | .51**  | .42** | .42**  | .46** | .67** | -     | -          | -.43**        | .51**         | .51**    | .42**       | .46**    | .67**          |
| 10| .15**   | .18**    | .20**   | .20**| .26**    | .26**    | .26**  | .28** | .28**  | .28** | .20** | .18** | -          | -.15**        | .20**         | .20**    | .20**       | .28**    | .28**          |
| 11| .37**   | .35**    | .31**   | .39**| .30**    | .36**    | .32**  | .38** | .48**  | .54** | .31** | -     | -          | -.37**        | .31**         | .31**    | .31**       | .31**    | .31**          |
| 12| .47**   | .46**    | .42**   | .52**| .35**    | .49**    | .49**  | .69** | .74**  | .20** | .66** | -     | -          | -.47**        | .69**         | .74**    | .20**       | .66**    | .20**          |
| 13| .41**   | .43**    | .43**   | .49**| .33**    | .44**    | .46**  | .54** | .48**  | .52** | .29** | .46** | .57**       | -.41**        | .52**         | .52**    | .29**       | .46**    | .57**          |
| 14| .47**   | .43**    | .39**   | .43**| .23**    | .41**    | .45**  | .44** | .47**  | .40** | .12** | .32** | .42**       | -.47**        | .40**         | .40**    | .12**       | .32**    | .42**          |
| 15| .50**   | .51**    | .45**   | .53**| .38**    | .50**    | .42**  | .50** | .69**  | .71** | .20** | .56** | .75**       | -.50**        | .69**         | .71**    | .20**       | .56**    | .75**          |
| 16| .15**   | .13**    | .14**   | .12**| .18**    | .22**    | .21**  | .22** | .17**  | .23** | .31** | .26** | .20**       | -.15**        | .17**         | .23**    | .31**       | .26**    | .20**          |
| 17| .32**   | .34**    | .36**   | .34**| .32**    | .54**    | .35**  | .37** | .42**  | .44** | .23** | .39** | .46**       | -.32**        | .35**         | .37**    | .42**       | .44**    | .23**          |
| 18| .41**   | .41**    | .49**   | .33**| .24**    | .36**    | .26**  | .49** | .38**  | .33** | .28** | .23** | .33**       | -.41**        | .38**         | .33**    | .28**       | .23**    | .33**          |
| 19| .28**   | .32**    | .34**   | .32**| .33**    | .32**    | .33**  | .40** | .40**  | .39** | .26** | .37** | .41**       | -.28**        | .32**         | .33**    | .33**       | .40**    | .39**          |
| 20| .33**   | .37**    | .37**   | .35**| .36**    | .41**    | .35**  | .41** | .50**  | .56** | .31** | .50** | .55**       | -.33**        | .35**         | .35**    | .31**       | .50**    | .55**          |
| 21| .05     | .06**    | .08**   | .04**| .07**    | .10**    | .07**  | .07** | .08**  | .12** | .14** | .09** | .11**       | -.05         | .08**         | .07**    | .08**       | .12**    | .14**          |
| 22| .30**   | .34**    | .41**   | .29**| .31**    | .30**    | .25**  | .42** | .31**  | .31** | .29** | .27** | .31**       | -.30**        | .31**         | .31**    | .29**       | .27**    | .31**          |
| 23| .06     | .06**    | .08**   | .04**| .07**    | .10**    | .07**  | .07** | .08**  | .12** | .14** | .09** | .11**       | -.06         | .08**         | .07**    | .08**       | .12**    | .14**          |

*p < .05; **p < .01

Table 3

Factor Loadings
### Table 4

**Between-group Differences Caregivers’ Perception of Change in Children’s Internalising and Externalising Symptoms Before and During the Lockdown**

|                      | UK (n=995) | Turkey (n=854) | Test |
|----------------------|------------|----------------|------|
| **Internalising symptoms** |            |                |      |
| My child is worried  | 520 (52.3) | 467 (54.7)     | 1.08 |
| My child is restless | 529 (53.2) | 408 (47.8)     | 5.34*|
| My child is anxious  | 449 (45.1) | 445 (52.1)     | 8.97**|
| My child is sad      | 430 (43.2) | 363 (42.5)     | .095 |
| My child is uneasy   | 423 (42.5) | 343 (40.2)     | 1.045|
| **Total internalising symptoms change** | 17.40 (4.0) | 17.07 (3.9) | 1.81 |
| **Externalising symptoms** |            |                |      |
| My child argues with the rest of the family | 567 (57.0) | 401 (47.0) | 18.53***|
| My child cries easily | 377 (37.9) | 253 (29.6) | 13.97***|
| My child is angry    | 485 (48.7) | 391 (45.8)     | 1.61 |
| My child feels frustrated | 614 (61.7) | 287 (33.6) | 145.26****|
| My child is irritable | 569 (57.2) | 412 (48.2) | 14.76***|
| My child has behavioural problems | 262 (26.3) | 171 (20.0) | 10.20***|
| **Total externalising symptoms change** | 21.26 (4.6) | 20.00 (4.2) | 6.16***|

Note: Kaiser-Meyer-Olkin measure of sampling adequacy: (.96_{UK} & .95_{TR}; Bartlett’s test of sphericity p=.00 both for UK & TR factor loadings < .32 are suppressed)
Correlations Between Study Variables and Change in Children’s Internalising and Externalising Symptoms Before and During the Lockdown in the UK and Turkey

### Participants in the UK

|          | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|----------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|
| **Symptom Changes** |   |   |   |   |   |   |   |   |   |    |    |    |    |    |
| 1. Internalising symptoms | .73** | .01 | -.06* | -.12** | -.02 | .07* | .01 | .01 | -.03 | -.01 | -.06 | 27** | 26** |    |
| 2. Externalising symptoms | .64** | .07* | -.07* | -.10** | .00 | .09** | .01 | -.02 | -.05 | .00 | -.05 | 29** | 35** |    |

### Participants in Turkey

|          | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 |
|----------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| **Caregiver characteristics** |   |   |   |   |   |   |   |   |   |    |    |    |    |    |
| 3. Age  | .01 | -.05 | .07* | .27** | .07* | -.02 | .28** | .05 | .21** | .01 | .03 | -.14** | -.04 |    |
| 4. Marital status | -.09** | -.05 | .01 | .18** | .01 | .00 | .06 | .03 | .16** | .22** | .03 | -.13** | -.06* |    |
| 5. Education level | .02 | .01 | .10** | .01 | .13** | -.04 | -.09** | .03 | .12** | -.10** | -.03 | -.13** | .01 |    |
| 6. Employment status | -.04 | -.04 | .18** | .04 | .28** | -.05 | -.01 | -.01 | .03 | .06 | -.08* | .01 |    |    |
| 7. Ethnicity | -.01 | -.02 | .08* | .03 | .04 | .02 | -.02 | -.01 | .10** | .09** | .03 | .06 | .05 |    |

|          | 8  | 9  | 10 | 11 | 12 | 13 | 14 |
|----------|----|----|----|----|----|----|----|
| **Child characteristics** |   |   |   |   |   |   |    |
| 8. Age  | .10** | .02 | .38** | -.10** | -.08* | .02 | .01 | -.02 | .06 | .10** | .06 | .04 | .02 |
| 9. Gender | -.02 | .00 | .02 | -.04 | -.01 | -.01 | .03 | -.01 | -.02 | -.01 | -.01 | .03 | .01 |

|          | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
|----------|----|----|----|----|----|----|----|----|----|
| **Housing conditions** |   |   |   |   |   |   |    |    |    |
| 10. Number of rooms | .06 | .02 | .14** | .04 | .18** | .10** | -.01 | .12** | .04 | .29** | .33** | -.14** | -.06 |
| 11. Household members | .01 | .03 | .06 | .20** | -.08* | -.06 | .02 | .10** | .05 | .18** | -.12** | .02 | .06* |
| 12. Outdoor access | -.05 | -.07* | -.04 | .00 | .03 | .00 | -.03 | -.01 | -.01 | .18** | .07 | -.07* | -.05 |

|          | 13 | 14 | 15 | 16 | 17 | 18 |
|----------|----|----|----|----|----|----|
| **Mental health and wellbeing** |   |   |   |   |   |    |
| 13. DASS total | .19** | .22** | -.10** | -.07* | -.10** | -.14** | -.01 | -.02 | .03 | -.10** | .07* | -.02 | .53** |
| 14. Parenting role stress | .12** | .25** | -.16** | -.05 | .03 | -.09* | .03 | -.07* | -.01 | -.03 | .14** | -.04 | .47** |
| 15. SDQ Total | .22** | .31** | -.08* | -.10** | -.10** | -.11** | -.04 | .05 | -.16** | -.11** | .02 | -.06 | .39** | .42** |

|          | 16 | 17 | 18 |
|----------|----|----|----|
| **Response to COVID-19 and infection risk** |   |   |    |
| 16. Infection risk | .10** | .04 | .01 | -.07* | .05 | .11** | .03 | .03 | .04 | .04 | .11** | .03 | .10** | -.01 |
| 17. Infection worry | .14** | .05 | .03 | -.01 | -.01 | .01 | .00 | .05 | .05 | -.01 | -.04 | -.02 | .14** | .00 |
| 18. Co-existence difficulty | .24** | .30** | .00 | -.08* | -.02 | -.09* | .03 | .00 | .02 | -.02 | .11** | -.06 | .28** | .37** |
Table 6

Summary of Regression Analysis of Children’s Internalising Behaviour Change Before and During the Lockdown in the UK and Turkey

|                       | UK (n=995) | TR (n=854) |
|-----------------------|------------|------------|
|                       | B  | SE  | β  | R² | ΔR² | ΔF    | B  | SE  | β  | R² | ΔR² | ΔF    |
| **Step 1**            |    |     |    |    |     |       |    |     |    |    |     |       |
| Marital status       | -.40| .30 | -.04|    |     | 4.24  | -.13| .29 | -.01|    |     |       |
| Education level      | -.91| .29 | -.10|    |     |       | .30 | .32 | .03|    |     |       |
| Ethnicity            | .94 | .46 | .07|    |     |       | -.05| .45 | .00|    |     |       |
| Child age            | -.03| .06 | -.02|    |     |       | .17 | .06 | .10|    |     |       |
| Infection risk       | .47 | .33 | .05|    |     |       | .82 | .31 | .09|    |     |       |
| **Step 2**           |    |     |    |    |     |       |    |     |    |    |     |       |
| Marital status       | -.13| .29 | -.01|    |     | 47.23 | 1.10| .09 | .06|    |     | 15.80 |
| Education level      | -.85| .28 | -.09|    |     |       | .42 | .31 | .05|    |     |       |
| Ethnicity            | .62 | .44 | .05|    |     |       | -.04| .44 | .00|    |     |       |
| Child age            | -.05| .06 | -.03|    |     |       | .19 | .06 | .11|    |     |       |
| Infection risk       | .41 | .31 | .04|    |     |       | .68 | .30 | .08|    |     |       |
| DASS total           | .06 | .01 | .17|    |     |       | .06 | .02 | .17|    |     |       |
| Parenting stress     | .07 | .01 | .18|    |     |       | .02 | .02 | .04|    |     |       |
| **Step 3**           |    |     |    |    |     |       |    |     |    |    |     |       |
| Marital status       | .15 | .28 | .02|    |     | 76.74 | .88 | .62 | .05|    |     | 16.16 |
| Education level      | -.25| .28 | -.03|    |     |       | .53 | .31 | .06|    |     |       |
| Ethnicity            | .47 | .42 | .03|    |     |       | .00 | .44 | .00|    |     |       |
| Child age            | -.09| .06 | -.04|    |     |       | .17 | .06 | .10|    |     |       |
| Infection risk       | .15 | .30 | .02|    |     |       | .62 | .30 | .07|    |     |       |
| DASS total           | .03 | .01 | .10|    |     |       | .05 | .02 | .13|    |     |       |
| Parenting stress     | .02 | .02 | .05|    |     |       | -.01| .02 | .01|    |     |       |
| SDQ total            | .18 | .02 | .33|    |     |       | .11 | .03 | .15|    |     |       |
| **Step 4**           |    |     |    |    |     |       |    |     |    |    |     |       |
| Marital status       | .12 | .27 | .01|    |     | 35.04 | -.73| .61 | .04|    |     | 18.00 |
| Education level      | -.28| .27 | -.03|    |     |       | .54 | .31 | .06|    |     |       |
| Ethnicity            | .48 | .41 | .03|    |     |       | -.10| .43 | .01|    |     |       |
| Child age            | -.06| .06 | -.03|    |     |       | .16 | .06 | .09|    |     |       |
| Infection risk       | .14 | .30 | .01|    |     |       | .47 | .30 | .05|    |     |       |
| DASS total           | .02 | .01 | .07|    |     |       | .04 | .02 | .10|    |     |       |
| Parenting stress     | -.01| .02 | -.03|    |     |       | -.02| .02 | .05|    |     |       |
| SDQ total            | .15 | .02 | .27|    |     |       | .10 | .03 | .14|    |     |       |
| Infection worry      | .02 | .04 | .01|    |     |       | .11 | .04 | .09|    |     |       |
| Co-existence difficulty | .99 | .12 | .27|    |     |       | .61 | .12 | .18|    |     |       |

*p < .001, **p < .01, *p < .05 (2-tailed)
Table 7  
Summary of Regression Analysis of Children's Externalising Behaviour Change Before and During the Lockdown in the UK and Turkey

|                    | UK (n=995) | TR (n=854) |  |  |  |  |  |  |  |  |  |  |  |  |
|--------------------|------------|------------|---|---|---|---|---|---|---|---|---|---|---|---|
|                    | B | SE<sub>B</sub> | β | R<sup>2</sup> | ΔR<sup>2</sup> | ΔF | B | SE<sub>B</sub> | β | R<sup>2</sup> | ΔR<sup>2</sup> | ΔF |
| **Step 1**         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Caregiver age      | -.03 | .03 | -.04 |  .02 | .02 | 4.57 | -.05 | .03 | -.06 |  .01 | .01 | 1.69 |
| Marital status     | -.62 | .34 | -.06 |  -.77 | .35 | -.08* | -.74 | .69 | -.04 |  .21 | .34 | .02 |
| Education level    | -.77 | .35 | -.08* |  1.32 | .53 | .08* | .21 | .34 | .02 |  1.32 | .53 | .08* |
| Ethnicity          | 1.32 | .53 | .08* |  -.81 | .54 | -.05 |  1.32 | .53 | .08* |  -.81 | .54 | -.05 |
| Outdoor access     | -.81 | .54 | -.05 |  1.32 | .53 | .08* |  -.81 | .54 | -.05 |  1.32 | .53 | .08* |
| **Step 2**         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Caregiver age      | -.01 | .03 | -.01 |  -.01 | .03 | -.01 |  -.01 | .03 | -.01 |  -.01 | .03 | -.01 |
| Marital status     | -.31 | .32 | -.03 |  -.79 | .33 | -.08* |  -.79 | .33 | -.08* |  -.79 | .33 | -.08* |
| Education level    | -.31 | .32 | -.03 |  -.79 | .33 | -.08* |  -.79 | .33 | -.08* |  -.79 | .33 | -.08* |
| Ethnicity          | .94  | .50 | .06  |  .94  | .50 | .06  |  .94  | .50 | .06  |  .94  | .50 | .06  |
| Outdoor access     | -.46 | .51 | -.03 |  -.46 | .51 | -.03 |  -.46 | .51 | -.03 |  -.46 | .51 | -.03 |
| DASS total         | .05  | .01 | .12** |  .05  | .01 | .12** |  .05  | .01 | .12** |  .05  | .01 | .12** |
| Parenting stress   | .13  | .02 | .29*** |  .13  | .02 | .29*** |  .13  | .02 | .29*** |  .13  | .02 | .29*** |
| **Step 3**         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Caregiver age      | .00  | .03 | .00  |  .00  | .03 | .00  |  .00  | .03 | .00  |  .00  | .03 | .00  |
| Marital status     | .05  | .31 | .01  |  .05  | .31 | .01  |  .05  | .31 | .01  |  .05  | .31 | .01  |
| Education level    | -.06 | .32 | -.01 |  -.06 | .32 | -.01 |  -.06 | .32 | -.01 |  -.06 | .32 | -.01 |
| Ethnicity          | .75  | .47 | .05  |  .75  | .47 | .05  |  .75  | .47 | .05  |  .75  | .47 | .05  |
| Outdoor access     | -.69 | .48 | -.04 |  -.69 | .48 | -.04 |  -.69 | .48 | -.04 |  -.69 | .48 | -.04 |
| DASS total         | .02  | .01 | .05  |  .02  | .01 | .05  |  .02  | .01 | .05  |  .02  | .01 | .05  |
| Parenting stress   | .07  | .02 | .16*** |  .07  | .02 | .16*** |  .07  | .02 | .16*** |  .07  | .02 | .16*** |
| SDQ Total          | .22  | .02 | .35*** |  .22  | .02 | .35*** |  .22  | .02 | .35*** |  .22  | .02 | .35*** |
| **Step 4**         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Caregiver age      | -.01 | .02 | -.01 |  -.01 | .02 | -.01 |  -.01 | .02 | -.01 |  -.01 | .02 | -.01 |
| Marital status     | .03  | .30 | .00  |  .03  | .30 | .00  |  .03  | .30 | .00  |  .03  | .30 | .00  |
| Education level    | -.10 | .31 | -.01 |  -.10 | .31 | -.01 |  -.10 | .31 | -.01 |  -.10 | .31 | -.01 |
| Ethnicity          | .75  | .46 | .05  |  .75  | .46 | .05  |  .75  | .46 | .05  |  .75  | .46 | .05  |
| Outdoor access     | -.63 | .46 | -.04 |  -.63 | .46 | -.04 |  -.63 | .46 | -.04 |  -.63 | .46 | -.04 |
| DASS total         | .01  | .01 | .02  |  .01  | .01 | .02  |  .01  | .01 | .02  |  .01  | .01 | .02  |
| Parenting stress   | .03  | .02 | .07  |  .03  | .02 | .07  |  .03  | .02 | .07  |  .03  | .02 | .07  |
| SDQ Total          | .19  | .02 | .29*** |  .19  | .02 | .29*** |  .19  | .02 | .29*** |  .19  | .02 | .29*** |
| Co-existence difficulty | 1.20 | .13 | .29*** |  1.20 | .13 | .29*** |  1.20 | .13 | .29*** |  1.20 | .13 | .29*** |

***p < 0.001, **p < 0.01, *p < 0.05 (2-tailed).