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Parents and school-aged children's mental well-being after prolonged school closures and confinement during the COVID-19 pandemic in Mexico: a cross-sectional online survey study

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ABSTRACT

Objective This study aimed to determine parents' and school-aged children's mental well-being after experiencing confinement and prolonged school closures during the COVID-19 pandemic.

Design Using a cross-sectional design, an online survey was applied to parents of school-aged children inquiring about their mental well-being and COVID-19 pandemic changes in their home and working lives. To assess the presence of depression, anxiety and stress in parents, the participants responded to the Depression, Anxiety and Stress Scale - 21 scale. To assess psychosocial dysfunction and sleep disturbances in children, participants responded to the Pediatric Symptom Checklist and the Children Sleep Habits Questionnaire.

Results A total of 209 parents answered the questionnaire, most of them were female (87.1%) with a mean age of 40 years. The prevalence of anxiety, stress and parental depression symptoms were 35.9%, 28.2% and 25.4%, respectively. Children's mean age was 8.9 years, the prevalence of children's psychosocial dysfunction was 12%, while their sleep disturbance symptoms were 59.8%. 10.5% of children were suffering both outcomes. We found a bidirectional relationship between parents' and children's mental health outcomes. Parental depression symptoms were associated with experiencing COVID-19 infection within the household, having children with pre-existing medical diagnoses, children's psychosocial dysfunction and sleep disturbances. Children's psychosocial dysfunction was associated with parental depression and changes in their school routine. Children's sleep disturbances were associated with parental anxiety, younger age, increased use of electronic devices, night-time awakenings and shorter sleep time.

Conclusion Our results support the impact of long confinement and school closure due to the COVID-19 pandemic in Mexican children and parents' mental well-being. We advocate for specific mental health interventions tailored to respond to parents and children at risk of mental well-being distress.

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Isolation and social distancing measures directed to ameliorate the COVID-19 pandemic can represent a risk for the mental well-being of children and parents.

WHAT THIS STUDY ADDS

⇒ Long confinement during the COVID-19 pandemic is associated with deterioration in parents' and children's mental well-being.
⇒ Parental depression symptoms were associated with experiencing COVID-19 infection within the family and having children with sleep disturbances and pre-existing medical diagnoses.
⇒ Children's psychosocial dysfunction and sleep disturbance were associated with parental depression symptoms, changes in school routines and increased use of electronic devices.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ This study provides rationale for the development of specific mental health intervention tailored to respond to parents and children at risk of mental well-being distress.

INTRODUCTION

The COVID-19 pandemic has dramatically impacted life around the world. Globally, as the pandemic has unfolded, prevention strategies and social distancing interventions were established, including the closure of schools, offices, shops and recreational areas.[1] As a result of the established measures, the routines of families and children were seriously affected.[2 3]

Studies conducted at the beginning of the COVID-19 pandemic reported the detrimental effects of social distancing measures on parents' and children's mental health. In

the USA, it was found that one in four parents experienced worsening in their mental health, while one in seven children in their behavioural health.[4] In Hubei province in China, a prevalence of 22.6% for depressive symptoms and 18.9% for anxiety symptoms in elementary school students was observed.[5]

Other studies carried out in countries such as Australia and England reported an increase in the presentation of depressive symptoms,[6 7] as well as a lower rate of referral to mental health services in children and adolescents related to closure measures.[8]

Specifically, studies that have investigated the impact of school closures on children's well-being have found an increase in depressive symptoms and non-suicidal self-injury,[9] while others have discussed the importance of school structure for adolescents in regions such as sub-Saharan Africa, who may be more exposed to domestic abuse related to school closures.[10]

In Mexico, mandatory home confinement, social distancing and school closure were implemented in March 2020 and strictly lasted until August 2021.[11] The closure of schools, offices and recreational parks was established, as well as restrictions on supermarket hours. The Mexican Ministry of Public Education adopted homeschooling and broadcast its school programme through television, while most private schools adopted online classes. The end of the school closure was heterogeneous throughout the country, starting with the areas with the least risk of COVID-19 infection. By November 2021, most schools had partially returned to face-to-face activities. The implementation of these restrictive policies led to both parents and children being exposed to confinement and school closure for at least one continuous year.

The findings of studies carried out in other countries and the prolonged confinement and school closure policies established in Mexico, underline the need to enhance our knowledge of the effects of those measures on parents and children. This study aimed to determine parents' and children's mental well-being after experiencing prolonged school closure and confinement in Mexico during the COVID-19 pandemic.

METHODS

Study population and sample

We conducted a cross-sectional web-based study during the COVID-19 pandemic in Mexico from February to May 2021. After obtaining authorisation from group administrators, an open invitation for parents to participate was made through three active Facebook closed school groups. Participants were eligible for the study if they were aged 18 years or over, lived in Mexico during all the COVID-19 pandemic development, and were parents or guardians to a school-aged child (6–12 years). The exclusion criterion was an incompletely answered form. The minimum sample size required for the study was 200 (with a base proportion of 0.15, a confidence level of 95%, and a 5% margin of error). The total sample of the study included 209 predominantly middle-class Mexican parents, with a mean age of 40.2 years, 87.1% were female, 83.8% were married, 46.6% had a college degree and 72.3% were employed. Children's mean age was 8.91 years, 54.1% of them were females.

Rating instruments

We developed a questionnaire to assess sociodemographic information and changes within the family's house and working lives related to confinement due to the COVID-19 pandemic. The items included questions about parents' occupation, confinement status, working modality during the COVID-19 pandemic, perceived changes in time spent with their children and perceived difficulties to adjust to changes in their routine. They were also asked about their children's current state of activity, schooling and media use. Finally, they were asked to answer validated scales to assess their mental well-being.

To measure the presence and degree of depression, anxiety and stress symptoms in parents, the participants responded to the Depression, Anxiety and Stress Scale-21 (DASS-21). Its items are rated on a 4-point scale and are equally divided to form three subscales: stress, anxiety and depression. The total score for each subscale ranges from 0 to 21 and can rank the severity of symptoms as below the threshold, mild, moderate, severe and extremely severe. Scores ranging from 0 to 4 for depression, 0–4 for anxiety and 0–7 for stress are considered normal.[12]

To assess sleep, emotions and behaviour in children, the participants were asked to respond to the Children's Sleep Habits Questionnaire (CSHQ) and the Pediatric Symptom Checklist (PSC). The CSHQ is a 45-item parent-rated questionnaire designed to examine sleep behaviour in school-aged children. The CSHQ includes 33 scored questions rated on a 3-point scale according to the frequency of presentation (usually, sometimes or rarely). The total score ranges from 33 to 99, with higher scores representing more sleep disturbances. A score over 41 can indicate a paediatric sleep disorder.[13]

The PSC is a 35-item screening questionnaire, designed to be completed by parents, to identify school-age children with difficulties in psychosocial functioning. All 35 items are rated on a Likert scale from 0 to 2, which sums to a total score range from 0 to 70. The cut-off score of 28 or higher indicates psychosocial difficulties. The questionnaire also provides 3 subscale scores for attention symptoms (normal score under 7), internalising/anxiety/depression symptoms (normal score under 5), and externalising/conduct symptoms (normal score under 7).[14]

Data analysis

We made a description of parents' and children's sociodemographic characteristics using mean and ±SD for quantitative variables and frequencies for qualitative variables.

For parents' outcomes, binominal logistic regressions were performed to ascertain the effects of age, gender, marital status, education level, number of children, having children with medical diagnoses, confinement status, working modality, COVID-19 positive diagnoses and having children with psychosocial dysfunction and sleep disturbances on the likelihood that participants had depression, anxiety and stress.

For children's outcomes, binominal logistic regressions were performed to ascertain the effects of age, gender, confinement status, schooling modality, electronic device use, total sleep time, night-time awakenings, parental depression, stress and anxiety on the likelihood that participants had psychosocial dysfunction and sleep disturbances.

For each model, the variable selection was made based on hypotheses and substantive previous knowledge on the subject.[15] Linearity of the continuous variables with respect to the logit of the dependent variable was assessed via the Box-Tidwell procedure. A Bonferroni correction was applied using all terms in each model. All the logistic regression models were statistically significant. The data were analysed using SPSS V.20.0.

Patient and public involvement

No patients or members of the public were involved in the design of the study. After answering the questionnaire for the study, participants received feedback and contact information for specialised mental health attention if needed.

RESULTS

A total of 209 parents were recruited for the study. We found that 87.1% were female, 83.8% were married, 46.4% had a college degree and 52.6% had at least two children.

Parents reported experiencing drastic changes in both their activities and work routine. 93.3% of them were confined at home, only leaving for essential activities such as grocery shopping and face-to-face work. 45.9% described that just one person in the family was leaving the house regularly while other family members were mostly at home. 72.2% of parents were employed and 32.1% of them were working from home. 68.1% of parents reported that they were finding it hard to adapt to their routines.

Children's mean age was 8.91 years; 54.1% of them were female, 93.8% of them were at home-school modalities (online platform, TV, email) while only 2.4% were attending school face to face. The demographics are shown in Table 1.

According to their DASS-21 scores, 25.4% parents reported depression symptoms, 35.9% anxiety symptoms and 28.2% stress symptoms. 28.2% had multiple symptoms, with 14.3% scoring positive for at least two outcomes and 13.8% scoring positive for all three outcomes (depression, anxiety and stress). The prevalence of psychosocial

Table 1 Parents' and children's demographics

Parents' demographic characteristics	
Gender	
Female	87.1%
Male	12.9%
Age (years), mean (SD)	40.18 (6.54)
Marital status	
Single	5.7%
Married	83.8%
Divorced	9.6%
Widowed	1.0%
Parental education	
High school	6.7%
College	46.4%
Master's degree	43.1%
PhD	3.8%
Children living in the household	
One child	21.1%
Two children	52.6%
Three or more children	25.9%
Occupation	
Housewife	27.8%
Employee	72.2%
Confinement status	
Leaving the house just for essential activities (grocery shopping, pharmacy, work)	93.3%
Leaving the house regularly, not only for essential activities	6.7%
Working modality during COVID-19 pandemic	
Working from home	32.1%
Partial attendance (most days working from home)	17.2%
Face-to-face attendance	23%
COVID-19 confirmed cases within the family household	
Yes	35.9%
No	64.1%
Children's demographic characteristics	
Gender	
Female	54.1%
Male	45.9%
Age (years), mean (SD)	8.91 (2.297)
Medical diagnosis	
Asthma	2.4%
Allergic rhinitis	2.4%
Autism	1.4%

Continued

Table 1 Continued

Parents' demographic characteristics	
Congenital heart disease	1.0%
Attention-deficit hyperactivity disorder	1.0%
Epilepsy	0.5%
Children's confinement status	
Leaving the house	2.4%
Not leaving the house	97.6%
Children's school modality	
Online platform	92.9%
T.V.	3.8%
Partial attendance	1.9%
Face-to-face attendance	0.5%
Out of school	1.0%
Changes in electronic device use	
Same use	2.9%
Mild increase	23.4%
Significant increase	73.2%

Table 2 Parents' and children's mental health outcomes

Parents' DASS-21	
Depression symptoms, mean score (SD)	25.4%, 6.69 (6.95)
Depression severity	
Normal	74.6%
Mild	10%
Moderate	8.6%
Severe	4.3%
Extremely severe	2.4%
Anxiety symptoms, mean score (SD)	35.9%, 6.49 (6.82)
Anxiety severity	
Normal	64.1%
Mild	11.5%
Moderate	15.8%
Severe	2.4%
Extremely severe	6.2%
Stress symptoms, mean score (SD)	28.2%, 11.78 (7.86)
Stress severity	
Normal	71.8%
Mild	12.4%
Moderate	9.1%
Severe	4.3%
Extremely severe	2.4%
Children PSC and CHSQ	
PSC	
Mean score, (SD)	17.02, (8.75)
Psychosocial dysfunction (score >28)	12%
Attention symptoms	38.8%
Internalising symptoms	12%
Externalising symptoms	7.7%
CHSQ	
Mean score, (SD)	43.95, (7.45)
Sleep impairment (score >41)	59.8%

CSHQ, Children Sleep Habits Questionnaire; DASS-21, Depression, Anxiety and Stress Scale-21; PSC, Paediatric Symptom Checklist.

difficulties for children was 12% according to their PSC scores, 59.8% had sleep disturbances and 10.5% were experiencing both outcomes. Table 2 summarises parents' and children's findings.

Regarding parents' outcomes, being married (p=0.011, OR=6.571, 95% CI 1.536 to 28.107) and having children experiencing psychosocial dysfunction (p=0.016, OR=3.470, 95% CI 1.258 to 9.568) were related with higher odds of stress symptoms.

Being married (p=0.011, OR=6.555, 95% CI 1.530 to 28.082), having COVID-19 confirmed cases within the family household (p=0.039, OR=2.225, 95% CI 1.040 to 4.761) and having children with medical diagnoses (p=0.014, OR=4.879, 95% CI 1.373 to 17.330), psychosocial dysfunction (p=0.001, OR=6.496, 95% CI 2.146 to 19.663) and sleep disorders (p=0.005, OR=3.721, 95% CI 1.502 to 9.217) were related with depression symptoms.

Leaving the house just for essential activities (p=0.05 OR=3.665, 95% CI 0.998 to 13.455) and having children with sleep disturbances (p=0.001, OR=3.550, 95% CI 1.720 to 7.328) were associated with increased odds of anxiety symptoms.

Homeschooling and parental depression were associated with children's psychosocial dysfunction. Younger age, night awakenings, and the presence of parental anxiety were related to increased odds of having sleep disturbances, while longer total sleep time duration was associated with a reduction in the likelihood of sleep disturbances as shown in table 3.

DISCUSSION

Consistent with other studies' findings, our data support that the influence of confinement and social distancing on families' routines and mental well-being has been significant. Parents that participated in the study not only experienced drastic changes in their work and activities but also noted that they were experiencing anxiety, stress and depression symptoms. These findings agree with those reported by Cusinato *et al*, who documented increased levels of anxiety in parents and lower levels of well-being and perceived self-control, which could lead to risks in children's well-being.[16]

Being married was associated with stress and depression symptoms. This could be related to married life

Table 3 Logistic regression analysis of children's mental health outcomes

	Psychosocial dysfunction*				Sleep disturbances†			
Variable	P value	OR	95% CI for OR lower	Upper	P value	OR	95% CI for OR lower	Upper
Age	0.512	1.084	0.851	1.381	0.002	0.761	0.643	0.902
Gender	0.963	0.978	0.380	2.515	0.954	1.020	0.524	1.985
Homeschooling	0.042	1.291	1.010	1.649	0.157	0.167	0.014	1.986
Being confined at home	0.684	1.578	0.175	14.226	0.830	1.159	0.302	4.444
Increase in electronic device use	0.992	1.005	0.402	2.512	0.020	2.172	1.132	4.168
Total sleep time	0.661	0.897	0.550	1.461	0.002	0.572	0.400	0.818
Nighttime awakenings	0.928	1.003	0.942	1.067	0.012	1.086	1.018	1.159
Parental depression	0.024	3.519	1.184	10.459	0.067	0.423	0.169	1.060
Parental anxiety	0.447	1.597	0.478	5.337	0.040	2.406	1.043	5.550
Parental stress	0.317	1.940	0.529	7.113	0.911	0.945	0.350	2.548

*The logistic regression model was statistically significant, $\chi 2$ =25.421, p<0.04.
†The logistic regression model was statistically significant, $\chi 2$ =54.229, p<0.001.

roles and possible disproportionate caregiving distribution within the family household. Per the Organisation for Economic Co-Operation and Development during the COVID-19 pandemic, mothers were almost three times more likely than fathers to report that they took on most of the additional unpaid care work related to school closures and experienced stress.[17]

Considering most of the participants were mothers and almost half of them were working from home or with partial attendance, they may have experienced disproportionate burden during the pandemic as discussed by Douglas *et al*, who stated that mothers more often must manage their role as carers while being tasked with their children's education and of managing their employment duties.[18] Also, this could interact with their overall satisfaction with their partner's participation in caregiving, as Park *et al* found that women who reported dissatisfaction with their partner's participation in caregiving were more likely to report depressive symptoms.[19]

Leaving the house just for essential activities was associated with parents experiencing anxiety symptoms. This matches the finding reported in Italy, where a few days after the instalment of confinement measures, participants were experiencing lower psychological well-being, anxiety and depressive symptoms, perception of loss of control and less vitality.[20]

We evidenced an association between having COVID-19 confirmed cases within the household and depression symptoms. This was also similarly described by Coelho *et al* and could be related both to the burden related to the event and by the fear and uncertainty about the infection.[21]

Having children with any medical diagnoses was related to parents experiencing depression symptoms. This is consistent with previous literature, reporting that chronic health conditions in children can represent increased levels of stress in parents.[22] Within the pandemic context, health conditions among children making them more vulnerable to infectious consequences could also represent a sizeable source of concern for parents that may lead to depression symptoms.

After being in confinement and online home-schooling for over a year, 12% of children were experiencing psychosocial dysfunction; attention symptoms were the most prevalent, followed by internalising/anxiety-depression and externalising/conduct symptoms. These outcomes represent a significant rate increase compared with prepandemic estimated prevalence in the country,[23] but a slight decrease considering preliminary data of depression and anxiety symptoms reported at the beginnings of the pandemic in other countries.[24] The differences in prevalence could be partially related to the difference in time adjustment to both confinement and school modality and the period of the pandemic being studied.

Children home-school status did influence the presence of psychosocial dysfunction. This agrees with the finding reported by Pizarro-Ruiz and Ordóñez-Camblor, which showed changes in the mental health of children during the first 8–10 days of confinement, noting consequences of confinement on children in the affective and behavioural areas.[25] Additionally, 59.8% of children were experiencing sleep disturbances. Younger age, night awakenings, shorter total sleep time and increased use of electronic devices were significantly related to that outcome. This association is a finding also reported by MacKenzie *et al* study during the pandemic, which described that 40% of children were experiencing negative effects on their sleep approximately 5 months after the onset of the pandemic in Canada, also noting that those children were being more prone to demonstrate poorer physical and emotional well-being.[26]

Mental well-being in parents and children demonstrated bidirectional associations, such that parents' depression and anxiety affected children's psychosocial functioning and sleep, and having children experiencing psychosocial dysfunction and sleep disturbances were related to parental stress, anxiety and depression. A significant relationship between caregiver depression and stress symptoms with increased levels of psychosocial dysfunction among children, was also observed by Spencer *et al*,[27] suggesting that parents of children with better psychological adjustment experience fewer difficulties in their parental role, that could influence the presence of stress and mental health symptoms in them.

We consider the found associations within our data to be generalisable to our target population; however, the interpretation should be done considering certain limitations. First, the cross-sectional study design represents a short time-lapse of exploration, limiting the possibility to draw more robust conclusions and establish causality. Second, all data were obtained by parental report, leaving a need for direct children's assessment. Third, the use of Facebook groups could contribute to a selection bias, being not inclusive of parents that are not present on social media. Fourth, the open invitation for parents to participate could have drawn more concerned individuals about their children's mental health, influencing reported symptoms. Finally, the study sample did not include representation of vulnerable groups within the society, leaving the need for further exploration.

CONCLUSION

Prolonged school closures and confinement during the COVID-19 pandemic are having a remarkable impact on parents' and children's mental well-being. There is a need to further explore the long-term consequences for them and establish structured strategies to support families and children at higher risk.

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