

Greece

Email: antoniotheofilidis@outlook.com.gr

Received 18 June 2020; revised 6 August 2020;

accepted 12 August 2020.

Psychosocial consequences of COVID-19 in children, adolescents and young adults: A systematic review

doi:10.1111/pcn.13134

This Letter presents the main findings of a systematic review of 21 studies ($n = 33\,398$) on the psychosocial consequences of COVID-19 in children, adolescents, and young adults, following the PRISMA guidelines; the background, methods and results are presented as an online Supplement. According to our findings, excess worrying, irritability, home confinement, and fear of COVID-19 infection and transmission are associated with mild to severe anxiety symptoms during the COVID-19 epidemic.¹ Isolation could be a risk factor for deterioration in mental health, including depressive and anxiety symptoms, distress, fear, post-traumatic stress, and insomnia.²

Regarding anxiety disorders, the fear of COVID-19, widely known as ‘coronaphobia,’ has enhanced anxiety symptoms, with a further aggravating role mediated by isolation at home.² Individuals with anxiety disorders tend to be preoccupied with excessive hand-washing, extreme cautiousness, social distancing measures and unnecessary shopping.³ Furthermore, a strong correlation between family relations and fear of contracting COVID-19 was noted.⁴ Focusing especially on COVID-19-infected patients, they were also affected, expressing high anxiety levels, as reported in SARS and MERS patients in the past.⁵

Mild to moderate depressive symptoms were also often expressed,¹ similarly to those recorded in the SARS and MERS periods,⁶ but at a geographically larger extent. According to the findings, the situation imposed by social distancing and isolation has affected the emotional reaction of the public broadly, causing not only distress, but also frustration, irritability, hopelessness, little interest or pleasure in activities, reduction in outdoor activities, extensive mobile phone use, and negative emotions about COVID-19.^{1, 2, 7} Moreover, an increase in violence during the pandemic, especially in adolescents and young adults, has been reported in the USA.⁸

During the COVID-19 pandemic period, behavioral changes have also been identified in children and adolescents with autism spectrum disorder (ASD) and attention-deficit/hyperactivity disorder (ADHD). Children with ASD, monitored by their parents, more frequently failed to follow through simple instructions, lost their independence and communication skills, engaged in problematic interactions with their parents, and performed pranks for attention.⁹ A series of guidelines, techniques, and physical exercises have been promoted in order to help ASD children remain calm during the pandemic.⁹ Children with ADHD, on the other hand, have been reported by their parents as uncontrollably angry, and unable to stay focused and perform everyday routines.¹⁰ New guidelines have been established to help address the mental health issues of children, proposing that monitoring medication and maintaining a strict sleep schedule could be beneficial.^{10, 11} Although online therapy sessions have been available and are considered adequate, lack of face-to-face clinical evaluation has limited their effectiveness.¹²

Furthermore, according to our findings, children, adolescents, and young adults have stayed home, restricting their mobility to absolute necessity and practicing social distancing due to school and university closure.¹³ The loss of everyday peer-to-peer contact, uncertain academic career, and use of online learning have created a new reality also in education. Screen time, not only for educational purposes, but also leisure

activities, has increased, with excessive use of social media, online gaming, and watching movies being more frequent.¹³ Thus, physical activity has been minimized and physicians have suggested daily activities, such as aerobic, strength activities, or bone strengthening, in order to avoid consequences of inactivity.

Children and parents have experienced everyday challenges and one important finding was that parents seemed to be more anxiety-stricken than their children.⁴ Crucial efforts by parents have been made in introducing stress-relief activities, including reading and exercising, with online sources providing tips and activities. Also, parents of children with special needs have experienced more mood swings and excessive concern about the COVID-19 impact according to the main findings.⁴

The use of technology has made a significant impact in the well-being of individuals, with health workers (such as doctors, psychiatrists, psychologists, social workers, and others) being available through online services. Despite the limitations of no physical interaction, telehealth has been reported as effective in diminishing and managing emotional and anxiety symptoms, not only in youth, but also in parents.^{2, 4, 6, 13}

In conclusion, a deterioration in mental health is highlighted, encompassing anxiety and mood symptoms, and developmental, stressor-related, and eating disorders among children, adolescents, and young adults during the COVID-19 pandemic. The new reality in everyday life and education due to COVID-19 has burdened the existing conditions, especially in children with neurodevelopmental disorders, where an enhancement in dysfunctional behaviors has been noted. COVID-19 is a rapidly evolving scientific and social field; therefore, further results are anticipated to rapidly accumulate.

Disclosure statement

The authors declare no conflicts of interest.

References

1. Zhou S-J, Zhang L-G, Wang L-L *et al.* Prevalence and socio-demographic correlates of psychological health problems in Chinese adolescents during the outbreak of COVID-19. *Eur. Child Adolesc. Psychiatry* 2020; **29**: 749–758.
2. Brooks SK, Webster RK, Smith LE *et al.* The psychological impact of quarantine and how to reduce it: Rapid review of the evidence. *Lancet* 2020; **395**: 912–920.
3. Liang L, Ren H, Cao R *et al.* The effect of COVID-19 on youth mental health. *Psychiatry Q.* 2020; **91**: 841–852.
4. Asbury K, Fox L, Deniz E, Code A, Toseeb U. How is COVID-19 affecting the mental health of children with special educational needs and disabilities and their families? *PsyArXiv* 21 April 2020. <https://doi.org/10.31234/osf.io/sevyd>.
5. Kong X, Zheng K, Tang M *et al.* Prevalence and factors associated with depression and anxiety of hospitalized patients with COVID-19. *medRxiv* 5 April 2020. <https://doi.org/10.1101/2020.03.24.20043075>.
6. Rogers JP, Chesney E, Oliver D *et al.* Psychiatric and neuropsychiatric presentations associated with severe coronavirus infections: A systematic review and meta-analysis with comparison to the COVID-19 pandemic. *Lancet Psychiatry* 2020; **7**: 611–617.
7. Xie X, Xue Q, Zhou Y *et al.* Mental health status among children in home confinement during the coronavirus disease 2019 outbreak in Hubei province, China. *JAMA Pediatr.* 2020. <https://doi.org/10.1001/jamapediatrics.2020.1619>
8. Ragavan MI, Culyba AJ, Muhammad FL, Miller E. Supporting adolescents and young adults exposed to or experiencing violence during the COVID-19 pandemic. *J. Adolesc. Health* 2020; **67**: 18–20.
9. degli Espinosa F, Metko A, Raimondi M, Impenna M, Scognamiglio E. A model of support for families of children with autism living in the COVID-19 lockdown: Lessons from Italy. *Behav. Anal. Pract.* 2020. <https://doi.org/10.1007/s40617-020-00438-7>
10. Cortese S, Coghill D, Santosh P, Hollis C, Simonoff E, European ADHD Guidelines Group. Starting ADHD medications during the COVID-19 pandemic: Recommendations from the European ADHD Guidelines Group. *Lancet Child Adolesc. Health* 2020; **4**: e15.
11. Cortese S, Asherson P, Sonuga-Barke E *et al.* ADHD management during the COVID-19 pandemic: Guidance from the European ADHD Guidelines Group. *Lancet Child Adolesc. Health* 2020; **4**: 412–414.

12. Zhang J, Shuai L, Yu H *et al.* Acute stress, behavioural symptoms and mood states among school-age children with attention-deficit/hyperactive disorder during the COVID-19 outbreak. *Asian J. Psychiatr.* 2020; **51**: 102077.
13. Oosterhoff B, Palmer CA, Wilson J, Shook N. Adolescents' motivations to engage in social distancing during the COVID-19 pandemic: Associations with mental and social health. *J. Adolesc. Health* 2020; **67**: 179–185.

Supporting information

Additional Supporting Information may be found in the online version of this article at the publisher's web-site:

Background, Methods, Results, Tables and Figure (Background_Suppinfo.docx).

Appendix S1. Supporting information.

Androniki Stavridou, BSc, MSc,¹ Angeliki-Argyroula Stergiopoulou, BSc,¹ Eleni Panagouli, MD, PhD,^{1,2} Gerasimos Mesiris, BSc,¹ Athanasios Thirios, MD, MSc,¹ Theodoros Mouggiakos, MD,³ Theodore Troupis, MD, PhD,² Theodora Psaltopoulou, MD, PhD,^{1,4} Maria Tsolia, MD, PhD,¹ Theodoros N. Sergentanis, MD, PhD,^{1,4†} and Artemis Tsitsika, MD, PhD,^{1†}

¹Second Department of Pediatrics, "P. & A. Kyriakou" Children's Hospital, National and Kapodistrian University of Athens, ²Department of Anatomy, School of Medicine, National and Kapodistrian University of Athens, ³Psychiatric Clinic, P. Penteli, 414 Military Hospital of Athens, and ⁴Department of Clinical Therapeutics, "Alexandra" Hospital, School of Medicine, National and Kapodistrian University of Athens, Attica, Greece
Email: info@youth-health.gr

[†]The two senior authors contributed equally to this manuscript.
Received 30 June 2020; revised 3 August 2020;
accepted 17 August 2020.

Impact of the COVID-19 lockdown on antenatal mental health in Greece

doi:10.1111/pcn.13135

On 22 March 2020, a total lockdown was applied in Greece due to COVID-19. In this unprecedented situation, the psychological impact on the population, and especially on pregnant women, is largely unknown. Research at the time of previous similar epidemics (SARS and MERS) showed that pregnant women were more likely to be psychologically affected.^{1, 2}

Anxiety is prevalent in pregnancy; in a recent meta-analysis, the prevalence of self-reported anxiety symptoms was 18.2% in the first trimester, 19.1% in the second trimester, and 24.6% in the third trimester, and the overall prevalence for a clinical diagnosis of any anxiety disorder was 15.2%.³ Antenatal depression also affects up to 16% of the general pregnant population⁴ while epidemiological studies consistently demonstrate high rates of comorbidity between anxiety and depressive disorders.⁵ Studying antenatal mental health is of particular importance because of the potential negative consequences on perinatal outcomes,⁶ so we sought to assess anxiety and depressive symptoms in pregnant women living in the current quarantine conditions in Greece by applying the most

commonly used instruments for antenatal anxiety and depression: the State-Trait Anxiety Inventory (STAI) and the Edinburg Postnatal Depression Scale (EPDS).^{7–9}

All pregnant women who received routine antenatal care in a university clinic during the 6-week period of total lockdown were asked to complete the STAI and the EPDS. State (S)- and Trait (T)-anxiety scores are categorized as <36 (no anxiety), 36–45 (mild anxiety), 46–55 (moderate anxiety), 56–65 (high anxiety), and >65 (very high anxiety).⁷ A cut-off score of ≥46 was used to identify women with anxiety (moderate anxiety cut-off), while the EPDS cut-off score was ≥13; these were the dependent variables of interest.⁷ Associated risk factors with maternal anxiety and depression were also investigated in a multivariable logistic regression. The study protocol complied with all the relevant national regulations, conformed to the provisions of the Declaration of Helsinki, and was approved by the bioethics committee of the Aristotle University of Thessaloniki.

Overall, 269 women consented to participate in the survey; 27.5% ($n = 74$) were ≥ 35 years old, 55.8% ($n = 150$) were nulliparous, 94.4% ($n = 254$) reported spontaneous conception, 27.9% ($n = 75$) had been overweight before pregnancy, and 12.3% ($n = 33$) reported themselves as current smokers. Anxiety in pregnancy affected 37.5% of the participants (S-Anxiety), whereas 13.0% exhibited lifetime anxiety (T-Anxiety; $P < 0.001$). The median S-Anxiety value (transient, situational feelings at the moment; 42 [range: 24–67]) was higher than the median T-Anxiety value (general, ongoing feelings; 35 [range: 22–67]; $P < 0.001$), indicating a significant increase in anxiety levels during the lockdown.

For S-Anxiety, 21.6% of the women were classified as non-anxious, 40.9% had mild anxiety, 27.5% had moderate, 9.7% had high, and 0.3% had very high anxiety. Accordingly, for T-Anxiety, 52.4% were identified as non-anxious, 34.6% had mild anxiety, 10.8% had moderate, 1.9% had high, and 0.3% had very high anxiety. There were significant differences between the corresponding S- and T-Anxiety categories ($P < 0.001$). A moderate association was identified between the S- and T-Anxiety scores ($r = 0.549$; $P < 0.001$).

Based on the multivariable analysis, the first week following the lockdown was identified as an independent risk factor for S-Anxiety (odds ratio [OR]: 2.425; 95% confidence interval [CI]: 1.299–4.529). Moreover, the median S-Anxiety was significantly different among the study weeks ($P = 0.003$; Fig. 1). When assessing the individual STAI questions during Weeks 1, 3, and 6, we found that women had similar feelings of tension, strain, and confusion during the whole period. Moreover, during Week 6, they started feeling more frightened than before; accordingly, in Week 3 they felt more comfortable and relaxed than in Week 1, but this was reversed in Week 6 (Table S1). Finally, the third trimester of pregnancy was identified as an independent risk factor for anxiety in pregnancy in the multivariable analysis (OR: 1.913; 95%CI: 1.037–3.529).

Regarding antenatal depression, 215 women completed the EPDS and 14.9% ($n = 32$) were identified as depressed. Antenatal depression was associated with S-Anxiety ($P = 0.015$; OR: 2.570; 95%CI: 1.199–5.508) while, according to multivariable logistic regression, smoking was identified as an independent risk factor for antenatal depression during the lockdown (OR: 2.889; 95%CI: 1.028–8.118).

Concluding, the mass quarantine has negatively affected the anxiety levels of a large proportion of pregnant women (>50% at the first week of lockdown) in Greece, as they exhibited a significant increase in anxiety during the early stages of the lockdown. However, an encouraging aspect was that after the initial peak of anxiety levels during the first week, they then decreased, possibly due to the effective control of the disease in Greece. Similar studies may shed more light on the impact of the disease and the associated measures under less favorable conditions and hopefully serve as a guide for similar situations in the future.

Disclosure statement

The authors declare no conflicts of interest.