



## Response to: Child and family factors associated with child mental health and well-being during COVID-19 by McArthur et al.

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Received: 8 August 2022 / Accepted: 2 October 2022  
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To the Editor,

McArthur and colleagues' [1] paper was among the first to investigate the individual, environmental, and sociodemographic factors associated with children's mental health during the pandemic. The study's findings indicated that connectedness to caregivers was negatively associated with children's symptoms of anxiety and depression, and positively associated with their happiness. Moreover, children's anxiety symptoms were negatively associated with sleep, and both anxiety and depressive symptoms were positively associated with screen time. The authors are commended for having a large sample and including both maternal and child data. Furthermore, we applaud the authors' decision to study a current and relevant topic that has implications for children's development. However, several methodological issues raise concerns regarding the overall significance of the study's results, which we discuss in the following paragraphs.

Firstly, we believe that there are several problems with the researchers' definition of screen time and collection of screen time data. McArthur and colleagues [1] operationally defined screen time as "the duration of time [children] spent using electronic devices on a typical weekday and weekend day outside of schoolwork." (p. 4). However, this definition does not account for certain aspects of screen time that may have a positive impact. For example, they did not consider or control for screen time related to schoolwork, which may have occurred for some children during

the time of data collection (i.e., in July and August, when children may have been in summer school). The onset of the pandemic necessitated a shift to remote learning, which involves prolonged daily screen time. This time should be accounted for because it can exacerbate the negative effects of screen time on children's anxiety, depression, and happiness [2]. Therefore, controlling for children's screen time related to schoolwork may have changed the significance of the authors' results. Similarly, the researchers did not consider that children may have used screens for socialization. During the pandemic, many children used screens to stay connected with their friends [3]. Socialization on screens may have had a positive impact on children's mental health because it could have facilitated peer connectedness. The authors did not explore this interpretation and only focused on the negative implications of screen time. As a result, it seems as though screen time was perceived negatively in McArthur and colleagues' study. However, if screen time was predominantly used for academics and socialization, it may not have negatively impacted mental health and could possibly have had the opposite effect.

Moreover, the way in which screen time was measured raises questions about the accuracy of the findings. Children reported their own screen time via a single self-report measure. Previous research demonstrates that younger people make more errors when estimating their screen time and social media usage [4, 5]. As previous research shows that children may overestimate screen time when responding through self-reports [6], it is possible that the effect of screen time may be weaker than what was found. The researchers' findings indicate that children who reported higher screen time also reported higher anxiety and depressive symptoms. Despite this evidence, the authors reported small effect sizes (i.e.,  $\beta=0.11$ ,  $\beta=0.09$ ), and these effects may have been negligible if objective measures were used instead of subjective ones.

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Secondly, there was an absence of pre-pandemic measures which may have implications on the study's findings. For instance, the authors did not include any measure of screen time before the pandemic, even retrospectively. Therefore, although it is possible that children's screen time increased with the onset of the pandemic, there is no evidence to support this assumption, as children's screen time could have been very high already. To attribute the study's findings more directly to the pandemic, the authors could have included a measure that asked the participants about their pre-pandemic social behaviors and screen time (i.e., including for the purpose of connecting with others). Furthermore, participants' perceptions of the effects of the pandemic on their daily lives (e.g., anxiety felt due to the pandemic, adherence to public health guidelines) could have also been measured, due to their possible association with connectedness to others and the use of screen time [7]. These additional measures may have strengthened the authors' overall conclusions by showing a direct connection between the pandemic, children and family behaviors, and children's mental health.

Another factor that was not considered was the type of mental health services that children received prior to the pandemic. The strongest predictors of children's adverse mental health outcomes during the pandemic were their levels of anxiety and depressive symptoms prior to the pandemic. Although a relatively high proportion of children reported at-risk or clinical range mental health scores during the pandemic, it is difficult to attribute these results directly to the pandemic because there are no measures about previous mental health services. If participants' access and subsequent response to mental health services before and during the pandemic were compared, it would be clearer whether their poor mental health was a continuation of their prior struggles or if it could have been attributed to COVID-19.

In summary, identifying the predictors of children's well-being during the pandemic is important as evidence indicates that children's mental health declined during the pandemic [e.g., 8]. However, to gain deeper insight into the impact of the pandemic on children's mental health, it is necessary to develop a comprehensive strategy to evaluate children's screen time and to account for children's screen time and mental health services before the pandemic. We encourage authors in the field to consider the nuances in recent screen time research, as a number of current findings suggest that the association between screen time and mental health is complex and influenced by a multitude of factors [9].

**Author contributions** K.E. wrote the letter and incorporated feedback provided by co-authors. L.H., M.L., A.M., S.F., R.Q., and A.B. edited and provided feedback on drafts of the letter. All authors approved the final version of this letter.

**Funding** None.

## Declarations

**Conflict of interest** The authors have no conflict of interest to declare.

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