

# COVID-19 Lockdown in Spain: Psychological impact is greatest on younger and vulnerable children.

**Josep Matalí-Costa**

Hospital Sant Joan de Déu <https://orcid.org/0000-0002-1365-5837>

**Ester Camprodon-Rosanas** (✉ [ecamprodon@sjdhospitalbarcelona.org](mailto:ecamprodon@sjdhospitalbarcelona.org))

Hospital Sant Joan de Déu <https://orcid.org/0000-0003-0170-1717>

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## Research Article

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# COVID-19 Lockdown in Spain: Psychological impact is greatest on younger and vulnerable children.

## Authors:

Josep Matalí-Costa, PhD<sup>1,2</sup>, Ester Camprodon-Rosanas, PhD<sup>1,2</sup>

## Institutional affiliation, email and ORCID iD

1. Children and Adolescent Mental Health Research Group, Institut de Recerca Sant Joan de Déu, Barcelona, Spain

2. Child and Adolescent Psychiatry Hospital Sant Joan de Déu, Barcelona, Spain.

Josep Matalí-Costa

ORCID: 0000-0002-1365-5837

Email: [jmatali@sjdhospitalbarcelona.org](mailto:jmatali@sjdhospitalbarcelona.org)

Ester Camprodon-Rosanas (corresponding author)

ORCID: 0000-0003-017-1717

Email: [ecamprodon@sjdhospitalbarcelona.org](mailto:ecamprodon@sjdhospitalbarcelona.org)

## Abstract

In 2020, quarantine home confinement measures were implemented in Spain to control a pandemic for the first time. The objective of this study is to assess both the psychological and social impact of that “lockdown” on different age groups of children and adolescents, and also the different strategies adopted by families in that situation. We collected data via an online questionnaire answered by 850 participants, parents of young people aged between 4 and 18, between 24th April and 8th May 2020. Our results show that living in a home smaller than 80 m<sup>2</sup> is associated with an increased risk of presenting clinical symptoms of emotional or behavioural distress, with an odds ratio of 2.54 (95%CI: 1.07 - 6.02),  $p = 0.034$ ; while increased age is a predictor of better psychological functioning during lockdown: coefficient of 0.25 (95%CI: 0.07 - 0.41),  $p = 0.004$ . Moreover, age is also a marker of higher scores on the scale of psychological symptoms, with a coefficient of 0.02 (95%CI: 0.01 - 0.04),  $p = 0.005$ . To conclude, younger children present poorer behavioural and emotional functioning and more symptoms of emotional distress than adolescents during lockdown. Living in a small home is a risk factor for presenting clinical symptoms. These findings should be taken into consideration when planning for future home confinement episodes and when considering preventative strategies in the realm of mental healthcare.

**Keywords:** COVID-19, pandemic, quarantine, children, adolescents, mental health, psychological impact, psychosocial.

## Introduction

The SARS-CoV-2 coronavirus outbreak originated in the city of Wuhan, China, in December 2019. Due to the capacity of the virus to spread and infect many people, the World Health Organization declared the corresponding COVID-19 pandemic on 11th March 2020. As Orgilés et al. (2020) report, Spain is one of the countries that has been most affected by the pandemic. On 14th March 2020 the Spanish government decreed a State of Alarm and the home confinement, or “lockdown”, of the whole national population [1].

In general terms, this type of quarantine confinement consists of identifying people who may have been exposed to infection and restricting their movements, with the aim of reducing the risk of contagion for other people [2]. In Spain, as a consequence of the lockdown, schools throughout the country were closed. This meant that children and adolescents were suddenly deprived of the contact with peers and teachers that they usually experience, as well as having no extracurricular activities normally organised by their schools available to them, and they were obliged to stay at home. Moreover, the nature of the pandemic meant that many families also found themselves bereft of the support they typically receive from other sources (most notably, grandparents).

Spain has undergone one of the longest lockdowns of any European country. This may have important consequences since Brooks et al. (2020) [2] observed that the longer a period of home confinement lasts, the greater the resultant deterioration in mental health; specifically, increased post-traumatic stress symptoms, avoidance behaviour and anger. Those authors also point out that during lockdown families have to face other stress factors, such as the fear of infection, frustration and boredom, an inadequacy of supplies and a lack of clear and precise information. As the confinement lengthened, so the stressors also increased (possibly to include contagion, death of a family member, redundancy and the need to supervise children's schoolwork, as well as having to continue to live together in a reduced space). Consequently, children and adolescents who are at home with their families experience increased stress coupled with reductions in the support and resources necessary to cope with such a situation; all of which contributes to generating a risk for their mental health [3].

The COVID-19 pandemic is the first time that national quarantine measures have been implemented in Spain or in many other countries around the world, to control such a situation. We currently have little knowledge of the impact that the home confinement will have on physical and mental health and wellbeing. However, current scientific evidence shows that in such circumstances children are less active, spend more time in front of their screens, experience less regular sleep patterns, have a poorer diet, spend less time participating in outdoor activities and have far less interaction with their peers [4]. Furthermore, social isolation is a known risk factor for several mental disorders, including major depression and psychosis [5]. In children and adolescents, the longer exposure to these stressors lasts, the greater the risk that any detrimental psychological effects will also last for longer, including suffering from anxiety disorders such as panic disorder, obsessive-compulsive disorder, and post-traumatic stress disorder [3,4]. So, considering the possible negative effects of lockdown on the mental health of children and adolescents, especially those who are most vulnerable, and the characteristics of the pandemic, debate has emerged concerning whether it is beneficial in the long run to confine young people at all [3]. It has been argued that we should return to normal school life and educational activities progressively, but as soon as possible [6,7].

Orgilés et al. (2020) [1], carried out a study of a Spanish ( $n = 431$ ) and Italian ( $n = 712$ ) cohort of children and adolescents. They reported that 85.7% of parents had observed changes in the emotional status and behaviour of their children, with difficulty maintaining concentration being the most prevalent negative effect. In addition, 30% of parents stated that their children presented such symptoms as nervousness, irritability, restlessness, fatigue or a feeling of loneliness. Another finding of the study that we feel should be emphasised is that it confirmed that family routines change during lockdown, with more time in front of screens, less physical activity taking place and more time spent sleeping.

When considering negative effects on the mental health of young people, one of the most vulnerable groups consists of those who already suffer from a mental disorder [8]. Within this group, three different patterns of evolution have been reported at the clinical level. The first covers those whose mental health evolves well, with good support from their family, and who are able to continue well with their studies online without the danger of suffering from bullying or exclusion. The second pattern includes children who present moderate negative consequences of lockdown, with a reduced possibility of maintaining their educational progress or their previous social interaction and treatment. Meanwhile the third pattern reflects those who experience a worsening of their situation with an increase in negative interactions [3].

In addition to this, the COVID-19 pandemic threatens to disrupt the provision of mental health services. The rapid expansion of the epidemic forced professionals and the institutions they represent to rethink the provision of services and assistance. In response, policymakers, administrators and healthcare providers have taken bold steps towards enabling “telepsychiatry” to fill this sudden gap in care provision for our most vulnerable populations [9]. Through the use of telephone calls or videoconferences, many of the activities normally engaged in while physically present at a clinic have been maintained. Moreover, there has been a generalised feeling that this new model of care is here to stay, which has created a need to develop best practice guidelines, especially for adolescents [10].

All of this means that we now face a challenge that is still novel and largely unknown to us: how is the child and adolescent mental health network to respond to the psychological and social impact of lockdown on children and adolescents. In the light of this situation, the current study has two objectives. The first is to evaluate the psychological and social impact of lockdown on different age groups, while at the same time assessing the different strategies adopted by families to cope with this new situation. The second is to gauge concerns related to the mental health of young people in the post-lockdown period, and to appraise telemedicine as an additional tool for providing child and adolescent mental healthcare services. Through these goals, our study aims to respond to this new challenge we are facing.

## **Method**

### *Participants*

The participants in this study were residents in Spain who were the parents of children aged between 4 and 18 years ( $M = 8.3$ ;  $SD = 3.4$ ). Out of a total of 1,007 initial participants, the final valid sample consisted of 850. As not all respondents answered all the questions, the total number varies from one category to another and is indicated as appropriate in the results (Table 1 and 2). Responses from parents of children aged under 4 were excluded. A total of 90.4% of the respondents were mothers, 8.2% were fathers, and 1.4% were some other family member who lived with the child or adolescent.

## *Procedure*

As face-to-face meetings were not possible during lockdown, the participants were recruited via social media and communication networks, and we created a specific *ad hoc* online survey to distribute among them. Adopting a non-probabilistic snowball sampling strategy, we sent out the survey via a messaging service (WhatsApp™); we also used probabilistic methods to recruit participants via an announcement posted on the Hospital Sant Joan de Déu social media accounts (Twitter™ and Instagram™), and the hospital's *Faros* webpage (<https://faros.hsjdbcn.org/es>). The *Faros* web portal offers a space for the dissemination of knowledge on current issues in the field of child and youth mental health. It aims to be an important driver at different levels (political, social and cultural) towards improving the mental health of children and adolescents through the development of recommendations and proposals based on the dissemination of materials appropriate for different audiences. The hope is that through making the current best knowledge available to different audiences it will contribute to improving the wellbeing of children, adolescents and their families, and act as a support tool for parents and other professionals. The WhatsApp contact was initiated via our own personal contacts in the healthcare and other related professional sectors. All the participants responded anonymously.

We collected responses between April 24th and May 8th, when the whole of Spain was in lockdown. On April 27th, for the first time since the State of Alarm had been declared on 14th March, and on every subsequent day until it ended, children up to the age of six were allowed to leave their homes during the time slot from 12 noon to 2 pm; and those from six to 16 years old, between 4 pm and 6 pm. After 6 pm and up to 8 pm, adolescents aged over 16 could do go out with a self-certificate of responsibility and the consent of their parents. On May 8th, when we finished collecting responses, Spain continued to be in lockdown and the State of Alarm was in full effect.

The approval of the Ethics Board of the authors' institution was obtained for the research.

## *Instruments*

In accordance with the academic literature we reviewed on studies of the psychological impact of quarantine measures, we adapted questionnaires used in previous studies of populations that have experienced confinement [1].

Our survey consisted of four parts. The first collected sociodemographic data related to the participating parents and their children. The second concerned the relevant clinical data. To assess behavioural problems of children and adolescents, we used items adapted to Spanish from the PSC scale (Pediatric Symptom Checklist, Massachusetts General Hospital). The PSC is a questionnaire designed by Jellinek et al. (1988) to screen for emotional and behavioural problems in children and adolescents (4-16 years) [11]. It was designed for use by paediatricians and other healthcare professionals to improve recognition of psychosocial problems in young people in this age range. In total, it consists of 35 items to be answered by a parent or guardian; the items cover a wide range of emotional and behavioural problems that are common in young people. Each question elicits one of three possible answers: never, sometimes or frequently. The option "never" corresponds to a score of 0, "sometimes" to 1, and "frequently" to 2 points. The final result of the whole questionnaire is then obtained by summing the scores for all the items. For our present study, the possible responses to each item were adapted to a Likert-type scale in which the parents supplied information that completed the statement: "compared to before lockdown, my child is ....."; and the options were: "much worse" (1 point), "moderately worse" (2 points), "slightly worse" (3 points), "the same" (4 points), "slightly better" (5 points), "moderately better" (6 point) and "much better" (7 points).

Thus, higher scores on this scale indicate that a child/adolescent suffers fewer problems during lockdown. We calculated Cronbach's alpha for our study to be 0.958. For categorical study of the variables, we reclassified the previous scores of 1 to 3 as 1, indicating the group with poorer psychological functioning during lockdown; and from 4 to 7 as 0, indicating the group with similar or better psychological functioning. In addition, we added 3 novel items specific to a home confinement situation in order to generate information related to the behaviour of adolescents, these were: "runs away from home", "has problems with video games", "consumes drugs". We also collected information on the overall psychological functioning of the child/adolescent before and then during lockdown, graded on a Likert-type scale from 0 to 10, with higher scores indicating better psychological functioning. Again, for categorical analysis of this variable, scores from 0 to 4 were recoded as 1, indicating the group with poorer psychological functioning; and from 5 to 10 as 0: the group with better psychological functioning. The third part of our survey requested information regarding the habits of the young people during lockdown: daily routines, sport activities, continuing with social/family relationships (0 = no; 1 = yes); and also whether family relationships improved during lockdown. Finally, the fourth part gathered information on the concerns of parents related to the mental health of their children post-lockdown, the measures that parents would consider useful to reduce the consequences of the prolonged quarantine and also their assessment of the use of "telemedicine" as an additional tool for mental healthcare services.

### *Statistical analysis*

First, we analysed the statistics that described sociodemographics and other characteristics of interest in the study. We then performed bivariate analysis between the age groups to study emotional and behavioural symptoms, as well as overall psychological functioning. For categorical variables, a chi-square test ( $\chi^2$ ) was used; and ANOVA for continuous variables. When  $p < 0.05$ , the Bonferroni post-hoc correction was applied. Finally, we performed multivariate analysis with the variables for which  $p < 0.1$ . A logistic linear regression model was used for the dichotomous variables with the following model: house size (small = 1; medium/large = 0); age; PSC results in relation to the home confinement (equal or better = 0; worse = 1); and type of outdoor space (none or only a balcony = 0; terrace, garden or patio = 1). Similarly, a linear regression model for the continuous variables was applied with the following model: age, psychological functioning during confinement, loss of a relative (yes/no), current or past mental health treatment (yes/no), family income affected during lockdown (yes/no).

Statistical analysis was performed using Stata 12 software (Stata Corporation, College Station, Texas) [12].

### **Results:**

The average score from the emotional and behavioural questionnaire was 102.2 ( $SD = 3.1$ ) with scores ranging from 31 to 203. The mean psychological functioning score prior to lockdown was 6.0 ( $SD = 3.1$ ) and during the quarantine it was 5.1 ( $SD = 3.1$ ).

When we compared the effects on psychological functioning and the number of symptoms pre-lockdown and during the home confinement, at the sociodemographic level, we observed no differences related to the size of the population in the town where the subjects lived ( $p = 0.559$  and  $p = 0.075$ , respectively); nor were there any differences correlated with the number of people living together in the home ( $p = 0.407$  and  $p = 0.105$ ). In contrast, we did find statistically significant differences in the presence of symptoms in relation to the total area of the home ( $p = 0.88$  and  $p < 0.001$ ), as well as depending on

whether the housing had any outdoor space ( $p = 0.88$  and  $p < 0.001$ ); see Table 1. For the Bonferroni post-hoc correction applied to both these latter variables, the differences were established between living in a flat whose size was  $< 60 \text{ m}^2$  compared with living in one with an area of between 60 and  $80 \text{ m}^2$  ( $p < 0.001$ ), and also living in a flat  $< 60 \text{ m}^2$  versus living in one  $100\text{-}120 \text{ m}^2$  ( $p < 0.001$ ). Regarding outdoor space, the statistically significant differences were observed between having a terrace or a balcony ( $p = 0.043$ ); a terrace versus no outdoor space ( $p = 0.008$ ); a balcony versus a garden ( $p = 0.008$ ); a balcony versus a patio ( $p = 0.03$ ); and between having a garden and having no outdoor space ( $p = 0.002$ ).

When considering the habits and social consequences of lockdown, we observed no differences between pre-lockdown psychological functioning and that during the home confinement, or in the number of symptoms when studying: online contact with family and friends ( $p = 0.431$  and  $p = 0.242$ ); income affected by lockdown ( $p = 0.143$  and  $p = 0.222$ ); physical exercise ( $p = 0.975$  and  $p = 0.408$ ); or meditation ( $p = 0.381$  and  $p = 0.726$ ). Meanwhile, differences were observed in the level of psychological functioning when having to deal with the death of a family member ( $p = 0.038$ ), if they were in treatment for a mental health problem ( $p < 0.001$ ) and in the performing of daily routines during lockdown ( $p = 0.026$ ). In this last aspect, differences were also observed in the number of symptoms ( $p < 0.001$ ); see Table 2.

When studying the differences by age group, we saw that the younger the children were, the more symptoms were present (see Figure 1) and the poorer the psychological functioning became (see Figure 2); and these differences were statistically significant. When analysing each item by age group, we found statistically significant differences in the following symptoms: they become agitated and find it difficult to remain still ( $p < 0.001$ ); they have problems and argue with their parents ( $p = 0.001$ ); they are less interested in schoolwork ( $p < 0.001$ ); they do not become tired ( $p < 0.001$ ); they daydream frequently ( $p = 0.018$ ); they are easily distracted ( $p < 0.021$ ); they are frightened by novel situations ( $p = 0.040$ ); they do the homework set by the school ( $p < 0.001$ ); they have trouble maintaining their concentration ( $p = 0.015$ ); they are less concerned about their friends ( $p = 0.002$ ); they argue more with others ( $p < 0.001$ ); they are worried that their school grades will go down ( $p = 0.04$ ); they want to be close to their parents more than before ( $p < 0.001$ ); they think that they are bad ( $p = 0.020$ ); they frequently get hurt ( $p = 0.015$ ); they act as if they were younger than they are ( $p = 0.003$ ); they break the rules ( $p < 0.001$ ); and they are easily irritated by others ( $p < 0.001$ ) (see Supplementary Material, Table S1).

When studying the adolescents aged 14 to 18 years ( $n = 64$ , average age = 15.6,  $SD = 1.4$ ), their parents reported that 12.5% were worse off in relation to drug use than before lockdown; 26.5% had more problems with excessive use of video games as a result of the confinement; and 14.2% had eluded lockdown at some point by sneaking out from home.

In our multivariate analysis, we found that having a home with a total area of less than  $80 \text{ m}^2$  was associated with an increased risk of presenting more clinical symptoms of emotional and behavioural distress, with an OR of 2.54 (95% confidence interval (CI) = 1.07 - 6.02),  $p = 0.034$  (adjusted for death of a family member, routine, affected income, history of mental health treatment, age and size of the town where the subjects lived). In the linear regression analysis, age turned out to be a predictor of better psychological functioning during confinement with a coefficient of 0.25 (95%CI = 0.07 - 0.41),  $p = 0.004$  (model adjusted for total size of the home, age, death of a family member, routine, and current or past mental health treatment). The older the children/adolescents, the better they functioned psychologically during lockdown. In addition, age predicted higher scores on the symptom scale with a coefficient of 0.02

(95%CI = 0.01 - 0.04),  $p = 0.005$  (adjusted for age, current or past mental health treatment, affected income and death of a family member).

When studying the concerns that parents expressed regarding the different symptoms, we observed that they reported a high degree of concern that their children would develop increased fears, in 16.5% of cases; that they might have a traumatic experience, in 7.6% of cases; that they would become more moody, in 24%; and that they would become more aggressive in 18.8%. Meanwhile, in relation to the situation that they were experiencing, 7.2% of the parents expressed a belief that their children would need help from a mental health professional; while 24.6% saw this as a possibility. Furthermore, 6.3% of the parents said that they expected that they themselves would need help from a mental health professional, and 30.8% considered this to be a possibility.

Finally, in relation to telemedicine and mental healthcare, 71.6% of respondents stated that they thought that regular online visits at child/adolescent mental health centres would be useful, 59.2% considered an initial online visit would be useful, 58.3% considered online follow-up visits would be useful to monitor psychotropic drug use, and 46.6% considered it would be useful to hold online group therapy sessions.

### **Discussion:**

The aim of this research was to study the impact of lockdown on children and adolescents aged between 4 and 18, via an online survey answered by their parents or guardians. We also studied the concerns parents expressed about the impact of home confinement on their children, as well as whether they considered telematic measures to be a usefulness means of response during lockdown and possibly afterwards too. The data we collected show that home confinement has had an impact on the young population and our results thus support previous evidence that social isolation caused by the COVID-19 pandemic and lockdown affect the psychological wellbeing of children and adolescents [13]. Our main findings indicate that the lockdown has had the greatest impact on families living in small homes with no outdoor space, and that in general home confinement has affected young children more than adolescents. This has generated considerable concern for many parents who worry that both they and their children may need help from mental health professionals.

When we analyse the factors that have had the greatest influence on increased emotional distress, one of our first conclusions is that the lockdown has affected most those groups who were already vulnerable and had few resources at their disposal [8]. We have seen that living in poor conditions, and especially having to endure home confinement in a small flat with no or extremely reduced outdoor space, has worsened the lockdown experience and increased suffering. These results agree with those obtained by Orgilés et al. (2020) [1]: more psychological symptoms and more behavioural affectation are observed in Spanish than in Italian children. Those authors conclude that one of the reasons for the increased degree of affectation in young Spaniards is related to the characteristics of Spanish flats (fewer of them include a substantial outdoor space), as well as the fact that Italians have more possibilities of accessing parks and gardens.

At the same time, suffering a prior mental health disorder is a key factor in presenting more mental health problems during quarantine [8]. Furthermore, some studies suggest [1,2,8] that an additional risk factor is the difficulty that some young people experience of establishing routines during lockdown. This is especially true for patterns of behaviour related to access to telematic tools, and also to being in contact

with a parental level of education that is sufficient to accompany and assist children in academic tasks, as well as offering the possibility of search for leisure activities and routines in a confined situation. These factors are crucial for prevention. Such studies agree with the results we have obtained here, in which we observed that in families which had managed to maintain some type of routine, the children and adolescents showed better psychological functioning and exhibited fewer symptoms during lockdown. We consider the fact that we did not observe differences related to the impact of lockdown on family income is due to the specific moment when we carried out the study. However, from data on the social and psychological impact of previous economic crises and recessions, specifically that suffered in Spain in 2010 [14], we believe that in the short term, the psychological distress experienced by the most vulnerable groups will increase [8,14].

All of this leads us to consider that previous studies, and also the present one, can be of considerable help when it comes to designing strategies of planning for the demand that may emerge in reaction to a situation of generalised home confinement. Such strategies need to be aimed especially at the most vulnerable groups, and focus on preventing the disadvantages these groups already suffer from becoming worse [8].

Another factor that has had an impact on the suffering of children and adolescents, as expected, is the death of a family member during lockdown. Not being able to accompany the sick relative when they were admitted to hospital and, in many cases, not even being able to see them during the last days of their life, is an important factor in the suffering endured by children and adolescents [8]. In agreement with other authors, we consider that some of these young people may require professional attention to overcome these traumatic situations [8].

The few studies that have been published on the impact of confinement on the child and adolescent population do not address whether there are differences according to age group [13]. In contrast, in our study, we observed significant differences between the different age groups. Specifically, the youngest group of children (4-8 years) presented more problems than older adolescents did. The most common type of symptomatology we observed was adaptive, with predominance of anxiety and fear, and in many cases behavioural expressions of this in the form of irritability or restlessness. Our data thus provide important information on the significance of problems related to anxiety in this group of younger children, since previous studies which did not differentiate by age group showed a higher prevalence of depressive disorders [13]. A probable explanation of this type of expression of reduced wellbeing has to do with the children's understanding of what they are experiencing in a confined pandemic situation: the older the young person is, the greater their understanding of the reasons why the lockdown was necessary. These results could agree with previous studies which conclude that when confinement is voluntary and for reasons of solidarity (to avoid contagion), symptoms of anxiety and depression are fewer [2]. Such a level of understanding is more difficult to reach in younger children and consequently they express more discomfort in the form of anxiety and restlessness.

This has led to a high degree of parental concern regarding how to manage their children's behaviour and the possible future repercussions of lockdown. Although there are no conclusive data on what the real impact will be at the level of the onset of mental problems, and it is even difficult to start to predict these effects [1,8], it is clear that many parents consider that there is a high possibility that they themselves or their children will need professional help. This concern is consistent with studies which indicate that loneliness is associated with mental health problems that may present up to 9 years after the triggering event [13].

During lockdown, in attempts to maintain regular contact with patients, clinical assistance offered via telematic means has increased exponentially, through telephone calls, videoconferences and online groups. This means that mental health professionals have had to incorporate these methods into their practices and they appear to be useful tools that can be maintained in the future as an additional therapeutic option. Our study shows that parents evaluate this option positively and think that it is important for to have it available to them. However, despite this addition, mental health services may temporarily not be as widely available as they usually are and a lack of access to support services can be particularly harmful for vulnerable children or families who experience increased stress. Thus, school closures exacerbate inequities, disproportionately affecting already disadvantaged children [3,5]. Facing a possible increase in the demand for child and adolescent mental health services derived from the lockdown, the challenge is to develop mechanisms and prepare strategies that guarantee accessibility and which assess telemedicine as a tool that can be implemented in mental health services.

Our study suffered from numerous limitations. In the first place, it would have been interesting to collect data differentiated by sex, but this distinction was not included in the survey. Secondly, the people who responded to the survey probably have easy access to new technologies and a decent network connection, and they show a high degree of motivation when it comes to the mental health of their children. This would tend to exclude families in a more vulnerable socioeconomic position, who should also be evaluated. Thirdly, because it is an online survey with a large number of subjects, the children were not directly evaluated via a semi-structured interview to determine the presence of mental health problems or disorders: reports from parents are not as reliable. Fourthly, although the PSC scale was used as a base, the responses were modified on a specific *ad hoc* basis in order to provide us with information better suited to studying the reality of home confinement. However, at the time of the study, there were no validated tools to assess the mental health of children and adolescents in confined quarantine situations. It is also for this reason that we followed a similar structure in the evaluation to that of previous studies carried out in the Spanish population [1]. Finally, in relation to telematic assistance, more controlled and randomized studies are required to determine its efficacy.

Taking into account these limitations of this study, we still believe that the data obtained here allow us to conclude that the lockdown in the context of COVID-19 has been a stressor for children and adolescents, especially the youngest of them. This situation is most evident in more vulnerable families, specifically those that have been confined in small flats with no or very limited access to outdoor space. Faced with these facts, and especially considering possible future resurgent outbreaks, it is necessary to continue studying the impact of home confinement on the mental health of children and adolescents in the medium and long term. It is also necessary to design and develop useful and validated telematic tools for these situations and this population.

#### **Declaration of Conflicting Interests**

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

## References:

1. Orgilés M, Morales A, Delvecchio E, Mazzeschi C, Espada JP. Immediate psychological effects of the COVID-19 quarantine in youth from Italy and Spain [Internet]. PsyArXiv; 2020 Apr [cited 2020 Jul 3]. Available from: <https://osf.io/qaz9w>
2. Brooks SK, Webster RK, Smith LE, Woodland L, Wessely S, Greenberg N, et al. The psychological impact of quarantine and how to reduce it: rapid review of the evidence. *The Lancet*. 2020 Mar;395(10227):912–20.
3. Clemens V, Deschamps P, Fegert JM, Anagnostopoulos D, Bailey S, Doyle M, et al. Potential effects of “social” distancing measures and school lockdown on child and adolescent mental health. *Eur Child Adolesc Psychiatry*. 2020 Jun;29(6):739–42.
4. Wang G, Zhang Y, Zhao J, Zhang J, Jiang F. Mitigate the effects of home confinement on children during the COVID-19 outbreak. *The Lancet*. 2020 Mar;395(10228):945–7.
5. Fiorillo A, Gorwood P. The consequences of the COVID-19 pandemic on mental health and implications for clinical practice. *Eur Psychiatry* [Internet]. 2020 [cited 2020 Jul 3];63(1). Available from: [https://www.cambridge.org/core/product/identifier/S0924933820000358/type/journal\\_article](https://www.cambridge.org/core/product/identifier/S0924933820000358/type/journal_article)
6. Poletti M, Raballo A. Letter to the editor: Evidence on school closure and children’s social contact: useful for coronavirus disease (COVID-19)? *Eurosurveillance* [Internet]. 2020 Apr 30 [cited 2020 Jul 3];25(17). Available from: <https://www.eurosurveillance.org/content/10.2807/1560-7917.ES.2020.25.17.2000758>
7. Viner RM, Russell SJ, Croker H, Packer J, Ward J, Stansfield C, et al. School closure and management practices during coronavirus outbreaks including COVID-19: a rapid systematic review. *Lancet Child Adolesc Health*. 2020 May;4(5):397–404.
8. Fegert JM, Vitiello B, Plener PL, Clemens V. Challenges and burden of the Coronavirus 2019 (COVID-19) pandemic for child and adolescent mental health: a narrative review to highlight clinical and research needs in the acute phase and the long return to normality. *Child Adolesc Psychiatry Ment Health* [Internet]. 2020 Dec [cited 2020 Jul 3];14(1). Available from: <https://capmh.biomedcentral.com/articles/10.1186/s13034-020-00329-3>
9. Kannarkat JT, Smith NN, McLeod-Bryant SA. Mobilization of Telepsychiatry in Response to COVID-19—Moving Toward 21st Century Access to Care. *Adm Policy Ment Health Ment Health Serv Res*. 2020 Jul;47(4):489–91.
10. Barney A, Buckelew S, Mesheriakova V, Raymond-Flesch M. The COVID-19 Pandemic and Rapid Implementation of Adolescent and Young Adult Telemedicine: Challenges and Opportunities for Innovation. *J Adolesc Health* [Internet]. 2020 May [cited 2020 Jul 3]; Available from: <https://linkinghub.elsevier.com/retrieve/pii/S1054139X20302251>
11. Jellinek MS, Murphy JM, Robinson J, Feins A, Lamb S, Fenton T. Pediatric Symptom Checklist: Screening school-age children for psychosocial dysfunction. *J Pediatr*. 1988 Feb;112(2):201–9.
12. Stata Corp. *Stata Statistical Software: Release 12*. College Station, TX. 2011.
13. Loades ME, Chatburn E, Higson-Sweeney N, Reynolds S, Shafran R, Brigden A, et al. Rapid Systematic Review: The Impact of Social Isolation and Loneliness on the Mental Health of Children and Adolescents in the Context of COVID-19. *J Am Acad Child Adolesc Psychiatry* [Internet]. 2020 Jun [cited 2020 Jul 3]; Available from: <https://linkinghub.elsevier.com/retrieve/pii/S0890856720303373>
14. Salvador-Carulla L, Roca M. Mental health impact of the economic crisis in Spain. *Int Psychiatry Bull Board Int Aff R Coll Psychiatr*. 2013 Feb;10(1):8–10.

**Table and Figure Legends:**

Table 1. Sociodemographic characteristics, psychological functioning during lockdown, and emotional and behavioural symptoms. ( $n = 850$ )

Table 2. Social and economic consequences and habits during lockdown. ( $n = 850$ )

Figure 1. Emotional and behavioural symptoms by age group. *Mean (SD)*

Figure 2. Post-lockdown psychological functioning by age group. *Mean (SD)*

Supplementary Material

Table S1. Emotional and behavioural symptoms, by age groups. ( $n = 850$ )

Table 1. Sociodemographic characteristics, psychological functioning during lockdown, and emotional and behavioural symptoms. ( $n = 850$ )

	<i>n</i> (%)	Lockdown psychological functioning <i>M</i> ( <i>SD</i> )	<i>p</i>	Symptoms score <i>M</i> ( <i>SD</i> )	<i>p</i>
<b>Population of home town/city (<math>n = 847</math>)</b>					
< 1,000 people	31 (3.7)	4.8 (2.7)		108 (21)	
from 1,000 to 10,000 people	187 (22.1)	4.9 (3.2)		102 (21)	
from 10,000 to 100,000 people	300 (35.4)	5.0 (3.0)	0.559	100 (19)	0.075
> 100,000 people	329 (38.8)	5.3 (3.0)		104 (17)	
<b>Total area of home (m<sup>2</sup>) (<math>n = 750</math>)</b>					
< 60	46 (6.1)	4.6 (3.0)		87 (22)	
60 - 80	159 (21.2)	4.8 (3.1)		100 (20)	
80 - 100	228 (30.4)	5.1 (3.1)	0.088	101 (18)	< 0.001
100 - 120	135 (18.0)	4.9 (2.9)		104 (18)	
> 120	182 (24.3)	5.6 (3.0)		108 (16)	
<b>Total number of people living together during lockdown (<math>n = 849</math>)</b>					
2	53 (6.3)	4.7 (3.2)		98 (26)	
3	222 (26.1)	5.1 (2.9)	0.407	101 (18)	0.105
4 or more	574 (67.6)	5.0 (3.1)		102 (19)	
<b>Outdoor space at home (<math>n = 676</math>)</b>					
Terrace	231 (27.2)	5.2 (3.0)		104 (17)	
Balcony	311 (36.6)	5.0 (3.1)		99 (20)	
Garden	134 (15.8)	5.3 (3.1)		106 (18)	< 0.001
Patio	92 (10.8)	4.8 (3.0)		106 (17)	

None 81 (9.5) 5.0 (2.9) 95 (17)

Table 2. Social and economic consequences and habits during lockdown ( $n = 850$ )

	n (%)	Lockdown psychological functioning $M$ (SD)	$p$	Symptoms score $M$ (SD)	$p$
<b>Online contact with family/friends</b>					
Yes	841 (98.9)	5.10 (3.04)	0.431	102.28 (18.82)	0.242
No	8 (0.9)	4 (2.62)		92.25 (22.25)	
<b>Income affected by lockdown</b>					
Yes	386 (45.4)	5.05 (3.11)	0.143	101.33 (18.99)	0.222
No	464 (54.6)	5.12 (2.98)		102.81 (18.79)	
<b>Death of a family member</b>					
Yes	67 (7.9)	4.71 (3.35)	<b>0.038</b>	101.51 (19.24)	0.632
No	781 (91.9)	5.12 (3.02)		102.21 (18.88)	
<b>Mental health treatment (current or past)</b>					
Yes	724 (85.2)	4.05 (2.96)	<b>&lt; 0.001</b>	100.10 (22.16)	0.324
No	77 (9.1)	5.26 (3.03)		102.57 (18.36)	
<b>Routine</b>					
Yes, parents and children	629 (74.0)	5.25 (3.03)	<b>0.026</b>	104.40 (18.22)	<b>&lt; 0.001</b>
Only parents	70 (8.2)	4.16 (2.91)		93.34 (21.07)	
Only children	14 (1.6)	5.57 (2.87)		100 (14.88)	
No	131 (15.4)	4.85 (3.12)		95.95 (18.76)	
<b>Physical exercise</b>					
Yes	621 (73.1)	4.92 (3.10)	0.975	101.67 (24.06)	0.408
No	229 (26.9)	4.91 (3.02)		99.47 (17)	
<b>Meditation</b>					
Yes	149 (17.5)	4.95 (3.09)	0.381	101.60 (22.96)	0.726
No	515 (60.6)	5.20 (3.05)		102.30 (17.62)	

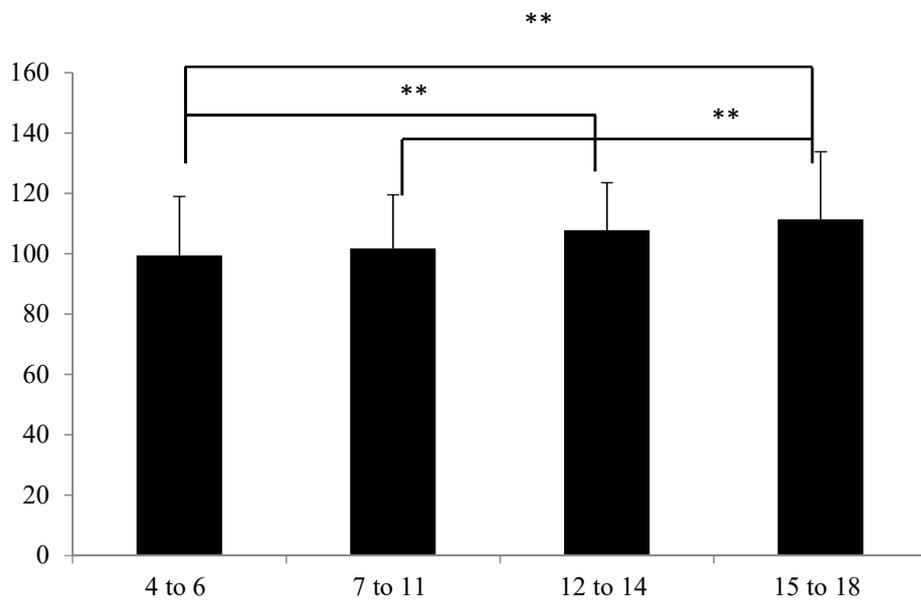


Figure 1. Emotional and behavioural symptoms by age group. *Mean (SD)*

Note: \*  $p < 0.05$ ; \*\*  $p < 0.001$

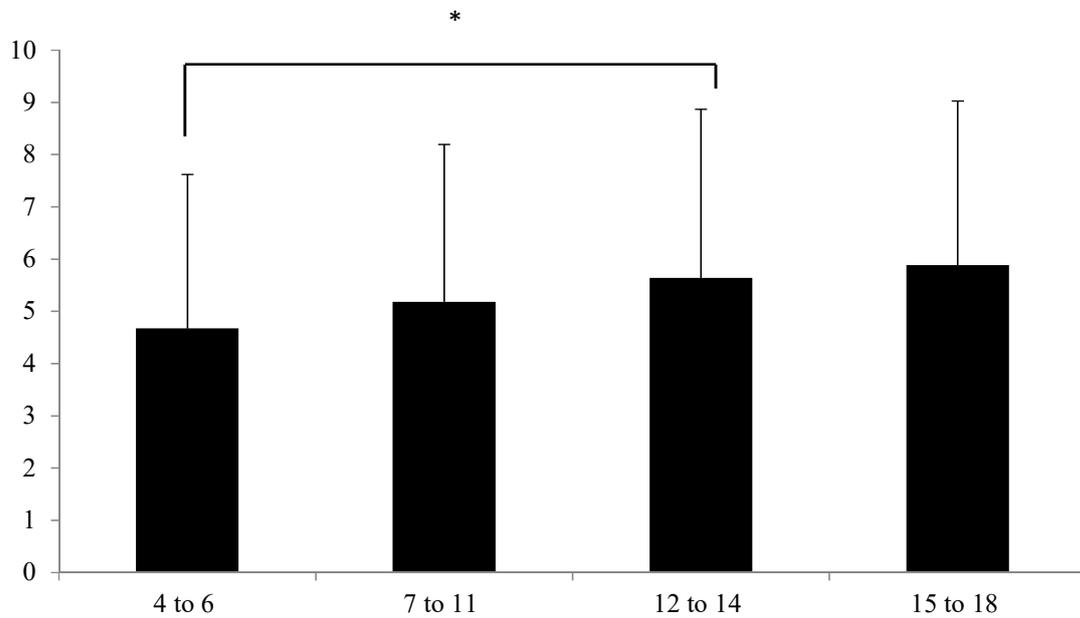


Figure 2. Post-lockdown psychological functioning by age group. *Mean (SD)*

Note: \*  $p < 0.05$ ; \*\*  $p < 0.001$

Table S1. Behavioral and emotional symptoms. Differences by age group. ( $n = 850$ )

Item	4-6 ages M (SD)	7-11 ages M(SD)	12-14 ages M(SD)	15-18 ages M(SD)	<i>p</i>
<b>Complains of aches and pains</b>	3.6 (0.98)	3.61 (0.89)	3.84 (1.16)	3.56 (1.09)	0.197
<b>Spends more time alone</b>	3.56 (1.45)	3.70 (1.26)	3.50 (1.54)	3.07 (1.61)	0.014
<b>Tires easily, has little energy</b>	3.41 (1.16)	3.35 (1.16)	3.40 (1.08)	3.36 (1.62)	0.907
<b>Fidgety, unable to sit still</b>	2.71 (1.24)	2.97 (1.19)	3.46 (1.01)	3.59 (1.09)	< <b>0.001</b>
<b>Has trouble with parents</b>	3.41 (1.19)	3.48 (1.09)	3.86 (1.09)	3.93 (1.49)	0.001
<b>Less interested in homework</b>	2.71 (1.22)	2.87 (1.27)	3.38 (1.33)	3.58 (1.56)	< <b>0.001</b>
<b>Acts as if driven by a motor</b>	3.09 (1.19)	3.40 (1.06)	3.78 (1.01)	3.85 (0.74)	< <b>0.001</b>
<b>Daydreams too much</b>	3.61 (0.95)	3.69 (0.89)	3.91 (0.81)	3.89 (0.89)	<b>0.018</b>
<b>Distracted easily</b>	3.06 (1.19)	3.17 (1.12)	3.34 (1.09)	3.53 (1.22)	<b>0.021</b>
<b>Is afraid of new situations</b>	3.27 (1.10)	3.31 (1.06)	3.61 (0.97)	3.70 (1.14)	<b>0.040</b>
<b>Feels sad, unhappy</b>	3.54 (1.14)	3.48 (1.04)	3.74 (0.11)	3.55 (1.32)	0.259
<b>Do the homeworks</b>	3.26 (1.22)	3.50 (1.18)	3.84 (1.18)	4.04 (1.34)	< <b>0.001</b>
<b>Feels hopeless</b>	3.89 (0.74)	3.88 (0.83)	3.87 (0.74)	3.72 (1.08)	0.545
<b>Has trouble concentrating</b>	3.16 (1.11)	3.13 (1.07)	3.42 (1.05)	3.54 (0.18)	<b>0.015</b>
<b>Less interested in friends</b>	3.20 (1.16)	3.50 (1.28)	3.57 (1.15)	3.69 (1.16)	<b>0.002</b>
<b>Fights with other</b>	3.14 (1.15)	3.37 (1.13)	3.63 (0.92)	3.68 (1.39)	< <b>0.001</b>
<b>Worried about his/her grades</b>	3.95 (0.68)	3.83 (0.92)	3.73 (0.97)	3.52 (1.38)	<b>0.004</b>
<b>Is down on him or herself</b>	3.65 (0.98)	3.59 (0.99)	3.85 (0.77)	3.77 (1.10)	0.110

(Continue)

Item	4-6 ages M (SD)	7-11 ages M(SD)	12-14 ages M(SD)	15-18 ages M(SD)	<i>p</i>
<b>Has trouble sleeping</b>	3.17 (1.24)	3.10 (1.16)	3.27 (1.14)	3.04 (1.45)	0.575
<b>Worries a lot</b>	3.47 (0.96)	3.43 (1.99)	3.58 (0.82)	3.44 (1.04)	0.645
<b>Wants to be with parents more than before</b>	2.96 (1.41)	3.29 (1.28)	3.80 (1.18)	3.75 (1.37)	<b>&lt; 0.001</b>
<b>Feels he or she is bad</b>	3.75 (0.89)	3.72 (0.97)	3.98 (0.63)	4.04 (1.04)	<b>0.020</b>
<b>Takes unnecessary risks</b>	3.84 (0.85)	3.93 (0.73)	3.97 (0.61)	4.12 (1.02)	0.097
<b>Gets hurt frequently</b>	3.88 (0.77)	3.98 (0.83)	3.98 (0.75)	4.28 (1.11)	<b>0.015</b>
<b>Visits the doctor with doctor finding nothing wrong</b>	3.66 (1.01)	3.61 (0.95)	3.70 (0.87)	3.96 (0.85)	0.104
<b>Seems to be having less fun</b>	3.47 (1.14)	3.45 (1.15)	3.52 (1.04)	3.37 (1.34)	0.891
<b>Acts younger than children his or her age</b>	3.39 (1.08)	3.60 (1.03)	3.67 (0.97)	3.88 (1.12)	<b>0.003</b>
<b>Does not listen to rules</b>	3.03 (1.21)	3.31 (1.09)	3.52 (0.91)	3.71 (1.16)	<b>&lt; 0.001</b>
<b>Does not show feelings</b>	3.87 (0.98)	3.77 (1.03)	3.70 (0.99)	3.58 (1.24)	0.179
<b>Does not understand other people's feelings</b>	3.73 (0.99)	3.83 (0.97)	3.73 (0.87)	3.73 (1.28)	0.569
<b>Teases others</b>	3.50 (1.04)	3.61 (1.03)	3.65 (0.98)	3.90 (1.24)	0.062
<b>Blames others for his or her troubles</b>	3.56 (1.07)	3.55 (1.07)	3.73 (0.80)	3.60 (1.30)	0.537
<b>Takes things that do not belong to him or her</b>	3.65 (0.98)	3.83 (0.83)	3.85 (0.69)	3.96 (1.03)	0.017
<b>Refuses to share</b>	3.64 (0.95)	3.74 (0.94)	3.85 (0.77)	3.84 (1.22)	0.166
<b>Is irritable with others</b>	2.97 (1.18)	3.28 (1.05)	3.43 (1.09)	3.59 (1.46)	<b>&lt; 0.001</b>

# Figures

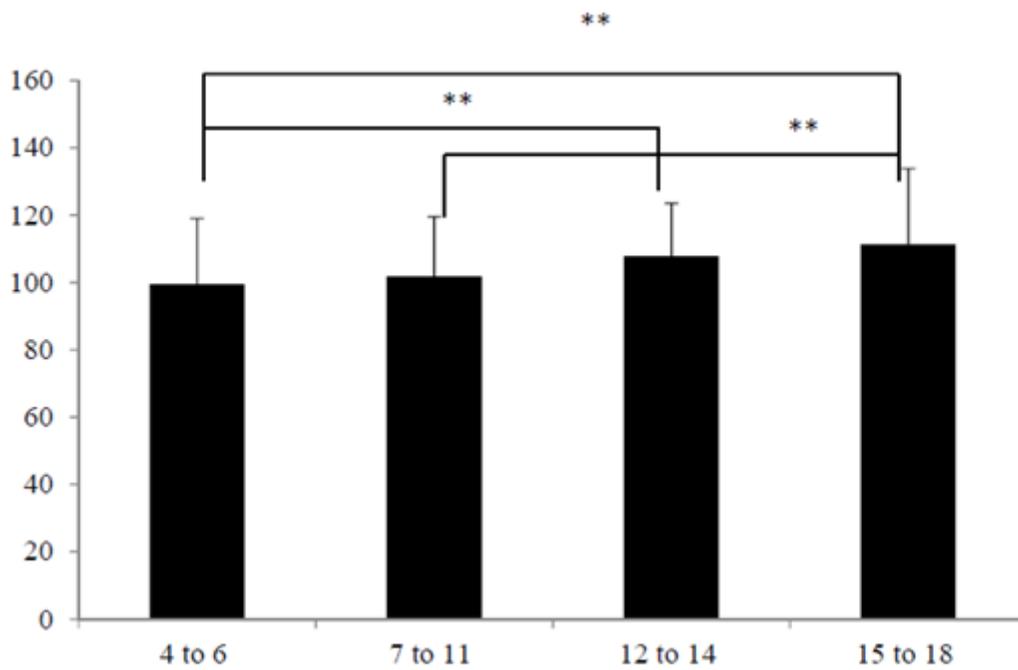


Figure 1

Emotional and behavioural symptoms by age group. Mean (SD) Note: \*  $p < 0.05$ ; \*\*  $p < 0.001$

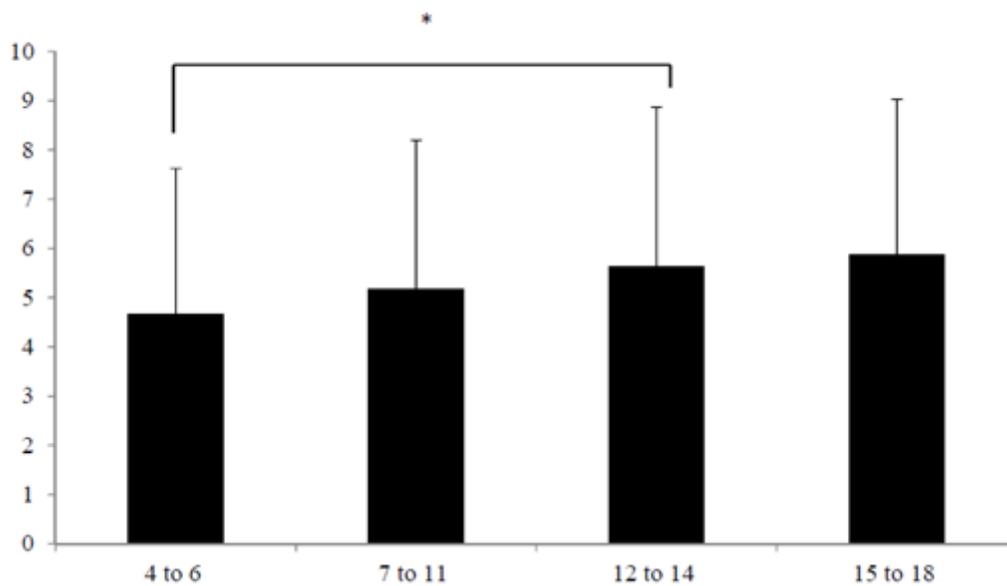


Figure 2

Post-lockdown psychological functioning by age group. Mean (SD) Note: \*  $p < 0.05$ ; \*\*  $p < 0.001$