ORIGINAL ARTICLE

Mental Health Impact of Coronavirus Disease 2019 Pandemic on Children with Psychiatric Disorder

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Abstract

Introduction: The first full lockdown due to the coronavirus pandemic in Portugal started in March 2020 and sent home every child, only to return to school in September the same year. Children are thought to cope harder with this pandemic, but little is known about those already struggling with psychiatric conditions.

Methods: We interviewed parents of 196 children in psychiatric follow-up in Clínica da Encarnação, a child psychiatry unit, Centro Hospitalar Universitário Lisboa Central, and reported their perception of the impact of the lockdown on the mental health of their children, as well as on their families.

Results: The parents reported a slight deterioration of their children condition and symptomatology, particularly irritability and anxiety. We identified several important fragility factors such as female gender, lower school grade, higher daily screen time, lower housing quality, parental precarious job situation, parental psychiatric disorder, pharmacologic treatment, and shorter follow-up time. We also found some resilience factors such as coronavirus disease 2019 cases in the family and school failure, as well as male gender and shorter daily screen time. The parents who reported a deterioration of familial conflicts also reported a worse lockdown impact on their children psychiatric condition.

Discussion: Our findings suggest a heterogeneous impact on these children's psychiatric symptomatology. Efforts should be made towards prevention along with interventions. The fragility and resilience factors identified should help direct these interventions.

Keywords: Child; Child Behavior/psychology; COVID-19/psychology; Mental Health; Mental Disorders/epidemiology; Pandemics; Portugal; Quarantine/psychology; Stress, Psychological/etiology; Surveys and Questionnaires

Keypoints

What is known:
- Little is known of the impact of the lockdown on children with psychiatric disorder.
- Children with psychiatric disorder are thought to have an increased vulnerability.

What is added:
- Children with psychiatric disorder might have worsened irritability and maintained the severity of other symptoms.
- Several potential fragility and resilience factors were identified.

Introduction

The coronavirus disease 2019 (COVID-19) outbreak emerged in Portugal in early March 2020, but a worldwide state of alarm had already been spreading for several weeks, with China reporting cases since December 2019.[1] Following the Italian struggle to cope with an out of hand rise in the infection rate, Portugal immediately launched severe containment measures to prevent the occurrence of the same. These measures included social distancing strategies along with a full lockdown. Schools and child facilities were closed, as in most public services, and children were sent home to be with their families. Due to lack of a previous sanitary lockdown experience, adults were facing enormous pressure, and their job situation was heterogeneous: unemployment, lay-off, rotating work schedule, working from home, or working normally whilst facing exposure

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to the virus and fearing the illness, either by contracting the disease or spreading it to loved ones. Anxiety and depression rates were predicted to rise as people faced such public health crisis.[2]

Children faced similar challenges as well, including staying at home, being closer to their families, and staying away from their schools and everything related to it (*eg* friends, teachers, learning, and playing). Schools restarted virtually after several weeks. The new learning method made a new challenge to families. Children are thought to have special vulnerabilities, depending on factors such as age, education, economic status, and pre-existing mental health condition.[3] Many studies have been performed on the impact of the pandemic on children.[4] But what about the mentally unhealthy children? It seems logical to suggest that, compared to adults, children probably struggle more to understand the pandemic, the lockdown, their new routine, and their parents fears.[5] These difficulties may tend to be even more intense in children with special needs. Several studies and reviews have suggested a relationship between children adaptation capabilities and family conflicts.[6,7] Some families of children with a psychiatric disorder are more prone to conflicts than otherwise. In addition, many therapy facilities as well as educational support centers were closed, which might have aggravated the condition of these children when schools reopened virtually. This is while children with special needs naturally face a greater challenge of struggling to do their work independently, relying less on family support or their routine educational help.[8] Children with psychiatric conditions also faced another adversity: their psychiatric follow-up had been compromised. The number of in-person consultations declined with the lockdown, as did the number of visits to the emergency units, probably reflecting parents fear of the virus and the early appeal of the government to reduce hospital admissions.[9]

This study mainly aimed to portray the lockdown impact on the psychiatric condition of children with ongoing follow-up at a child psychiatry unit and identify some potential fragility and resilience factors by correlating these factors with the perceived psychiatric impact.

Methods

Participants

This observational study was conducted among parents of children with active psychiatric follow-up prior to, during, and after the first lockdown due to the COVID-19 pandemic, at Clínica da Encarnação, a child and adolescent psychiatry unit at Hospital Dona Estefânia, in Lisbon, attending to children from 3 up to 12 years old.

Exclusion criteria were:

- Age 13 years and older on July 31st, 2020;
- Follow-up start after the onset of lockdown;
- Lack of co-habitation with the parent answering to the questionnaire through most of the lockdown;
- Inability to give consent or answer the questionnaire;
- The participant not being a parent of the child.

The procedure was finalized upon the reception of 196 responses.

Procedure

This cross-sectional study was conducted to explore how children with a psychiatric condition were coping with the pandemic. The questionnaires were conducted by child and adolescent psychiatry trainees. Participants were given no economic motivation, and oral consent was obtained by telephone before starting the questionnaire. The participants were assured that the data processing and presentations were anonymous and that they could, at any time, revoke their participation without consequences regarding the follow-up. Anonymity was kept to ensure data confidentiality.

The primary data were collected via a telephone questionnaire with a parent since personal contact had to be avoided to prevent unnecessary infection risks. This questionnaire was created specifically for this purpose and consisted of four parts:

- Socio-demographic: gender, age, place of birth and living, educational level, school failure;
- Household information: size and type of household, parental marital status, house size, changes in the household or residence, the history of COVID-19 cases in the close family members, conflicts variation in the household at the conjugal, fraternal, and intergenerational levels;
- Lifestyle information: hours of daily screen exposure;
- Psychiatric information: therapeutic support and whether it was discontinued during the pandemic or not, psychiatric follow-up time, current psychopharmacological treatment, whether a parent is followed-up in psychiatric consultation, whether the child needed to turn to the psychiatric emergency unit, parental perception of the variation of the psychiatric condition, and several symptoms, such as distractibility, irritability, isolation, fear, aggressiveness, sleep problems, sadness, nightmares, somatic complaints, separation difficulty, agitation, tantrums, anxiety, enuresis, encopresis, dysphoria, crying, tics, anhedonia, and eating problems.

Data were collected between September and December 2020.

Mental health impact assessment

Parents were asked to report their perception of symptomatic variation caused by the pandemic, compared with their previous routine. Each item had three possible answers that were scored from 0 to 2 (0 = deterioration, 1 = persistence, 2 = improvement) with higher levels indicating an improvement and lower levels indicating a deterioration. At the same time, if a sample scored a mean < 1, it would mean that this sample were perceived has having deteriorated, but improved if scored > 1. The mean impact (MI) was determined by subtracting one (persistence) from the mean result (μ-1). Mean difference (MD) was determined by calculating the difference between the two means (μ1-μ2).

Statistical analysis

Initially, descriptive statistics were performed to portray participants demographically. Secondly, two-tailed tests were conducted to determine statistical significance at the 5% level between the individual variables and the perception of variation. Data analysis was performed using IBM SPSS Statistics (version 26, Armonk, New York). Cohen d was posteriorly calculated to measure the effect size using Microsoft Excel 2016. Chi-square test was performed to assess categorical variables and Pearson chi-square was used as a correlation measure.

Results

Demographic assessment

The participants were in the age range of 3-12 years, with a mean ± standard deviation (SD) for age of 9.32 ± 2.27 years, and the majority of whom were male (72.5% boys and 27.5% girls). Almost all (91.8%) participants were born in Portugal, though 26% were from immigrant families. The vast majority lived in Lisbon or its suburbs. Nearly half of the participants had some sort of therapy in the community, 61.4% of whom discontinued therapy during the lockdown and were unable to resume it.

Psychiatric impact

Table 1 presents the perceived impact of symptomatic change on the psychiatric condition differentiated by symptoms. All items were perceived to have affected negatively, with anxiety, irritability, and agitation scoring the worst. On the other hand, elimination problems were perceived to have undergone the least variation.

Table 1. Absolute and relative frequency of the perceived symptomatic change

Variables	Mean impact*	Deterioration†	Persistence†	Improvement†
Whole condition	-0.07	67 (34.2)	75 (38.3)	54 (27.6)
Aggressiveness	-0.19	53 (27)	127 (64.5)	16 (8.2)
Agitation	-0.34	80 (40.8)	102 (52)	14 (7.1)
Anhedonia	-0.14	33 (16.8)	161 (82.1)	2 (1)
Anxiety	-0.38	88 (44.9)	95 (48.5)	13 (6.6)
Crying	-0.23	50 (25.5)	141 (71.9)	5 (2.6)
Distractibility	-0.19	55 (28.1)	123 (62.8)	18 (9.2)
Dysphoria	-0.14	31 (15.8)	162 (82.7)	3 (1.5)
Eating problems	-0.17	48 (24.5)	134 (68.4)	14 (70.1)
Encopresis	-0.02	4 (2)	192 (98)	0 (0)
Enuresis	-0.01	9 (4.6)	180 (91.8)	7 (3.6)
Fears	-0.19	49 (25)	135 (68.9)	12 (6.1)
Irritability	-0.35	94 (48)	77 (39.3)	25 (12.8)
Isolation	-0.11	39 (19.9)	139 (70.9)	18 (9.2)
Nightmares	-0.10	26 (13.3)	163 (83.2)	7 (3.6)
Sadness	-0.29	62 (31.6)	128 (65.3)	6 (3.1)
Separation difficulty	-0.22	46 (23.5)	147 (75)	3 (1.5)
Sleeping problems	-0.24	60 (30.6)	123 (62.8)	13 (6.6)
Somatic Complaints	-0.11	23 (11.7)	171 (87.2)	2 (1)
Tantrums	-0.24	58 (29.6)	127 (64.8)	11 (5.6)
Tics	-0.10	20 (10.2)	173 (88.3)	3 (1.5)

* mean impact = μ-1.
† n (%).

Socio-demographic factors

As presented in Table 2, boys seemed to have improved their psychiatric condition slightly (μ = 1.02), unlike girls who tended to deteriorate (μ = 0.7). In the same manner, girls scored significantly worse than boys on anxiety (MD = 0.24, *p* = 0.009, d = 0.4) and somatic complaints (MD = 0.22, *p* = 0.013, d = 0.47). Statistical differences were observed in terms of dysphoria and encopresis scores, although with small size effects.

Age also significantly affected the perceived impact on the children. Considering cut points between 8 and 10 years, being younger signified scoring worse on dysphoria (MD = 0.16, *p* = 0.028, d = 0.42), enuresis (MD = 0.17, *p* < 0.001, d = 0.59), fear (MD = 0.3, *p* = 0.002, d = 0.58), and nightmares (MD = 0.16, *p* = 0.006, d = 0.42). The opposite happened in the case of eating problems (Table 3), in which younger children were perceived to have improved slightly (μ = 1.02), as did the older ones in enuresis (μ = 1.04).

Children in lower school grades were perceived to have deteriorated in terms of dysphoria (MD = 0.2, *p* = 0.01, d = 0.52) and nightmares (MD = 0.15, *p* = 0.041, d = 0.4) more than those in more advanced grades, considering the third grade as a cut point. The perceived impact on eating problems varied differently by age. Children in upper grades might have slightly improved (μ = 1.04), as opposed to those in lower grades who were reported to have been significantly deteriorated (MD = 0.29, *p* = 0.001, d = 0.55). The same pattern was observed across most symptoms, but the differences were not statistically significant.

As presented in Table 4, children who failed the school year 2019-2020 were perceived to have deteriorated less than those who did not. This was statistically significant only in the state of agitation.

Lifestyle factors

The average time of daily screen exposure also changed the perceived impact on eating problems, as children with less screen time improved slightly (μ = 1.03), and those with daily screen time of more than two hours (school time excluded) might have deteriorated significantly (Table 5). The same tendency was observed across most symptoms, though to a statistically significant degree, except for isolation, which lacked a strong size effect (MD = 0.21, *p* = 0.031, d = 0.39).

Household factors

As presented in Table 6, housing quality significantly affected the perceived impact of the lockdown on enuresis. Setting a cut point at three rooms, it was found that children living in smaller houses might have deteriorated more in terms of agitation (MD = 0.28, *p* = 0.005, d = 0.47), sadness (MD = 0.17, *p* = 0.005, d = 0.55), and tantrums (MD = 0.4, *p* < 0.001, d = 0.77). Interestingly, they were reported to have improved in terms of tics, as opposed to those living in larger homes (MD = 0.14, *p* = 0.001, d = 0.43). Setting a cut point at five rooms (larger houses), it was found that children living in the most spacious houses improved considerably in terms of nightmares (MD = 0.31, *p* = 0.009, d = 0.79).

According to the parents, major household changes also made a difference in the symptomatology of children. Having someone abandoning or joining the household usually meant a worse perception of the impact on children mental health. As indicated in Table 7, this impact was found to be statistically significant in terms of sleep problems and crying.

The history of COVID-19 positive cases in the family also affected parents perception of the lockdown impact. Interestingly, it had only a statistically significant positive impact in terms of the isolation symptom (MD = 0.3, *p* = 0.024, d = 0.56).

Concerning parents marital status, we found very heterogeneous results without statistical significance.

Table 2. Pearson chi-square cross-table between variables of gender and perceived impact on the psychiatric condition

		Gender		
Impact on the whole condition		Male*	Female*	Total*
Deterioration	Count	45 (22.9)	22 (11.2)	67 (34.2)
	Expected count	48.3	18.4	67
Persistence	Count	49 (25)	26 (13.3)	75 (38.3)
	Expected count	54.1	20.6	75
Improvement	Count	48 (24.5)	6 (3.1)	54 (27.6)
	Expected count	38.9	14.8	54
Total	Count	142 (72.4)	54 (27.6)	196

* n (%).
Pearson chi-square 10.152, *p* = 0.006.

Table 3. Pearson chi-square cross-table between variables of age and perceived impact on eating problems

		Age		
Impact on eating problems		≥ 8 years*	> 8 years*	Total*
Deterioration	Count	6 (3.1)	42 (21.4)	48 (24.5)
	Expected count	13.2	34.8	48
Persistence	Count	41 (20.9)	93 (47.5)	134 (68.4)
	Expected count	36.9	9701	134
Improvement	Count	7 (3.6)	7 (3.6)	14 (7.1)
	Expected count	3.9	10.1	14
Total	Count	54 (2,,6)	142 (72.4)	196

* n (%).
Pearson chi-square 9.605, *p* = 0.008.

Parents status of employment also influenced their perception of the impact. Having one parent working from home did not have a significant perceived impact, but children with both parents in this situation were improved significantly in terms of anxiety, fears (MD = 0.31, p = 0.023, d = 0.59), separation difficulties (MD = 0.35, p = 0.014, d = 0.78), and tantrums (MD = 0.37, p = 0.011, d = 0.68), as presented in Table 8. Having one parent sent to lay-off did not affect the results, but having both might have had a very negative impact in terms of the children condition (MD = 0.52, p = 0.02, d = 0.67), irritability (MD = 0.45, p = 0.017, d = 0.65), and tantrums (MD = 0.57, p = 0.005, d = 1.07). Having one or both parents on a rotating work schedule had heterogeneous results, though without statistical significance, as was the case with unemployment.

Parents perceptions of the impact of lockdown on their families conflicts was very heterogeneous. Table 9 presents a slight improvement at the conjugal level (μ = 1.02), deterioration at the fraternal level (μ = 0.92), and an even worse deterioration at the intergenerational level (μ = 0.82).

Table 4. Pearson chi-square cross-table between variables of school year failure and perceived impact on agitation

		School year failure		
Impact on agitation		Yes*	No*	Total*
Deterioration	Count	3 (1.5)	77 (4.1)	80 (40.8)
	Expected count	8.6	71.4	80
Persistence	Count	14 (7.1)	88 (44.9)	102 (52)
	Expected count	10.9	91.1	102
Improvement	Count	4 (2)	10 (5.1)	14 (7.1)
	Expected count	1.5	12.5	14
Total	Count	21 (10.7)	175 (89.3)	196

* n (%).
Pearson chi-square 9.869, p = 0.008.

Table 5. Pearson chi-square cross-table between variables of daily screen time and perceived impact on the whole condition

		Daily screen time		
Impact on psychiatric condition		< 4 hours*	≥ 4 hours*	Total*
Deterioration	Count	5 (2.6)	62 (31.6)	67 (34.2)
	Expected count	9.9	57.1	67
Persistence	Count	11 (5.6)	64 (32.7)	75 (38.3)
	Expected count	11.1	63.9	75
Improvement	Count	13 (6.6)	41 (20.9)	54 (27.6)
	Expected count	8.0	46	54
Total	Count	104 (53.1)	92 (46.9)	196

* n (%).
Pearson chi-square 6.549, p = 0.038.

Table 6. Pearson chi-square cross-table between variables of house size and perceived impact on the enuresis

		House size		
Impact on enuresis		< 3 rooms*	≥ 3 rooms*	Total*
Deterioration	Count	5 (2.6)	4 (2)	9 (4.6)
	Expected count	5.5	3.5	9
Persistence	Count	114 (58.2)	66 (29.9)	180 (91.8)
	Expected count	109.3	70.7	180
Improvement	Count	0 (0)	7 (3.6)	7 (3.6)
	Expected count	4.3	2.8	7
Total	Count	119 (60.1)	77 (39.3)	196

* n (%).
Pearson chi-square 11.436, p = 0.003.

Table 7. Pearson chi-square cross-table between variables of household changes and perceived impact on sleep

		Major household changes		
Impact on sleep		No*	Yes*	Total*
Deterioration	Count	47 (24)	13 (6.6)	60 (30.6)
	Expected count	53	7	60
Persistence	Count	114 (58.2)	9 (4.6)	123 (62.8)
	Expected count	108.6	14.4	123
Improvement	Count	12 (6.1)	1 (0.5)	13 (6.6)
	Expected count	11.5	1.5	13
Total	Count	173 (88.3)	23 (11.7)	196

* n (%).
Pearson chi-square 8.237, p = 0.016.

Table 8. Pearson chi-square cross-table between variables of parents teleworking and perceived impact on anxiety

		Parents teleworking			
Impact on anxiety		None*	One*	Both*	Total*
Deterioration	Count	63 (32.1)	24 (12.2)	1 (0.5)	89 (45.4)
	Expected count	68.2	15.7	4	89
Persistence	Count	78 (39.8)	11 (5.6)	6 (30.6)	95 (48.5)
	Expected count	73.7	17	4.4	95
Improvement	Count	11 (5.6)	0 (0)	2 (1)	13 (6.7)
	Expected count	10.1	2.3	0.6	13
Total	Count	152 (77.6)	35 (17.9)	9 (4.6)	196

* n (%).
Pearson chi-square 915.729, p = 0.003.

Table 9. Absolute and relative frequency of the perceived impact on household conflicts

Household conflict variation	Perceived impact	n	%
At the conjugal level	Deterioration	11	5.6
	Persistence	171	87.2
	Improvement	14	7.1
At the fraternal level	Deterioration	32	16.3
	Persistence	146	74.5
	Improvement	18	9.2
At the intergenerational level	Deterioration	42	21.4
	Persistence	126	64.3
	Improvement	28	14.3

Table 10. Pearson chi-square cross-table between variables of conjugal conflicts and perceived impact on enuresis

		Variation of conjugal conflicts			
Impact on enuresis		Deterioration*	Persistence*	Improvement*	Total
Deterioration	Count	4 (2)	5 (2.6)	0 (0)	9 (4.6)
	Expected	0.5	7.9	0.6	9
Persistence	Count	7 (3.6)	159 (8.1)	14 (7.1)	180 (91.8)
	Expected	10.1	157	12.9	180
Improvement	Count	0 (0)	7 (3.6)	0 (0)	7 (3.6)
	Expected	0.4	6.1	0.5	7
Total	Count	11 (5.6)	171 (87.2)	14 (7.1)	196

* n (%).
Pearson chi-square 27.963, $p < 0.001$.

Table 11. Pearson chi-square cross-table between variables of intergenerational conflicts and perceived impact on the whole condition

		Variation of intergenerational conflicts			
Impact on the whole condition		Deterioration*	Persistence*	Improvement*	Total
Deterioration	Count	25 (12.8)	35 (17.9)	7 (3.6)	67 (34.2)
	Expected	14.4	43.1	9.6	67
Persistence	Count	9 (4.6)	54 (27.6)	12 (6.1)	7538.3)
	Expected	16.1	48.2	10.7	75
Improvement	Count	8 (4.1)	37 (18.9)	9 (4.6)	54 (27.6)
	Expected	11.6	34.7	7.7	54
Total	Count	42 (21.4)	12664.3)	28 (14.6)	196

* n (%).
Pearson chi-square 15.520, $p = 0.004$.

Table 12. Pearson chi-square cross-table between variables of follow-up time and perceived impact on separation difficulty

		Follow-up time		
Impact on separation difficulty		< 2 years*	≥ 2 years*	Total*
Deterioration	Count	33 (16.8)	13 (6.6)	46 (23.5)
	Expected count	22.1	23.9	46
Persistence	Count	60 (39.6)	87 (44.4)	147 (75)
	Expected count	70.5	76.5	147
Improvement	Count	1 (0.5)	2 (1)	3 (1.5)
	Expected count	1.4	1.6	3
Total	Count	94 (48)	102 (52)	196

* n (%).
Pearson chi-square 13.684, $p = 0.001$.

Table 13. Pearson chi-square cross-table between variables of a parent with a psychiatric disorder and perceived impact on the psychiatric condition

		Parents with psychiatric disorders		
Impact on the whole condition		No*	Yes*	Total*
Deterioration	Count	46 (23.5)	21 (10.7)	67 (34.2)
	Expected count	54.4	12.6	67
Persistence	Count	68 (34.7)	7 (3.6)	75 (38.3)
	Expected count	60.8	14.2	75
Improvement	Count	45 (23)	9 (4.6)	54 (27.6)
	Expected count	43.8	10.2	54
Total	Count	159 (81.1)	37 (18.9)	196

* n (%).
Pearson chi-square 11.432, $p = 0.003$.

Conflicts inside families affected very negatively the perceived impact of lockdown on the children psychiatric condition. Generally, it can be said that psychiatric symptoms deteriorated in families in which conflicts were reportedly worsened. Statistically, there was a significant difference in terms of the whole condition (MD = 0.3, p = 0.024, d = 0.56) and symptoms of crying, distractibility, dysphoria, irritability, isolation, sadness, separation difficulties, and tantrums.

Regarding the deterioration of the conjugal conflicts, these children were reported to have worsened in terms of enuresis, as presented in Table 10, as opposed to those in families without severe conflicts (μ = 1.01).

Regarding the fraternal conflicts, children from families with a reported deterioration at this level described a deterioration of fears (MD = 0.26, p = 0.019, d = 0.5), irritability (MD = 0.4, p < 0.001, d = 0.59), and isolation (MD = 0.28, p = 0.01, d = 0.54). Finally, in the case of families with worsened intergenerational conflicts, it was observed that children in these families were perceived to have deteriorated at a statistically significant degree both on the whole (Table 11) and on several symptoms, namely agitation, anhedonia, anxiety, crying, distractibility, dysphoria, irritability, sadness, separation difficulty, and tantrums.

Psychiatric factors

Duration of follow-up affected the perceived impact of the pandemic since those parents whose children received shorter periods of psychiatric support tended to report worse symptomatic variation. This was particularly true concerning separation difficulty considering a cut point set at two years (Table 12).

We could not find significant results regarding the consistency of therapeutic support.

Being on psychopharmacological treatment affected the results negatively, although in a heterogeneous way. The variation in some symptoms was found to be statistically significant, including agitation, dysphoria, irritability, sadness, sleeping problems, and tantrums, although with small size effects (d < 4).

Parents were also questioned regarding their own mental health. Parental psychiatric disorder often affected negatively the reported impact of the pandemic on the children's mental health. This was statistically evident regarding the whole condition (Table 13) and symptoms of agitation (MD = 0.29, p = 0.012, d = 0.48), anhedonia (MD = 0.17, p = 0.041, d = 0.44), anxiety (MD = 0.26, p = 0.014, d = 0.43), nightmares (MD = 0.21, p = 0.02, d = 0.55), and sadness (MD = 0.21, p = 0.037, d = 0.42).

Discussion

Our findings suggest that children with a psychiatric disorder experienced the lockdown heterogeneously. Most frequently, parents reported that the severity of childrens condition was not maintained. They appeared to have deteriorated in terms of the irritation, which was perceived to be the most significantly affected symptom, followed by agitation, sadness, sleeping issues, and tantrums. This was in line with several preliminary studies concerning the impact of COVID-19 on children.[10] Interestingly, symptoms that have worsened the least included elimination issues, nightmares, isolation, and somatic symptoms, according to parents.

Based on the reported data, boys coped with the lockdown better than girls, as confirmed by some recent studies.[11,12] Deterioration of anxiety and psychosomatic symptoms was more frequently reported among girls, as suggested in previous studies.[13]

Younger children appeared to have become more dysphoric and afraid and struggled more with nightmares and enuresis. On the other hand, the older ones were described to have deteriorated in terms of eating issues. Eating problems appear to have been slightly improved during confinement in younger children. Parental availability (*eg* parents in lay-off) might have played a role in facilitating this improvement.

School grades affected the perceived impact mostly in the same manner as age, which is understandable. However, this was not the case with eating problems, which were reported as having deteriorated in older children and in association with lower grades, as opposed to the younger children and higher grades who showed an improvement in terms of this symptom. The impact of school retention was unexpected. It appeared that children who didn't fail in the school year 2019-2020 got more agitated than those who did. Retention might be a protective factor here. However, we cannot provide an explanation for this at this point.

Although statistically insignificant, excessive exposure to television / computer / tablet or other kinds of screens appears to be related to voluntary social isolation (not due to circulation restrictions) and decreases interest in socializing (remotely or not). The effect of screen time on social skills and self-isolation has been studied widely.[14] Eating problems, on the other hand, were reported to have improved significantly with lower daytime screen exposure, a relationship that has been suggested already.[15]

The obtained results strongly suggest that family conflicts favour the deterioration of many symptoms. Environmental factors are known to play a major

role in the mental health of children[16] and familial conflicts have been suggested to predict symptoms of depression, anxiety, and conduct.[6] Although this may not be a normal cause-effect situation, the correlation is undeniable and should not be neglected.

Household changes appear to intensify the deterioration of the condition. One can hypothesize that the environmental and routine disruption associated with the entry or exit of a family member can have a significant impact on children, especially children with mental illness. Some families from our sample were forced to move in with other families due to financial issues. Reconfigurations of the family structure can cause the separation of children from important family members, either due to financial reasons or health issues (protecting the elderly from the COVID-19).

Having a large house was found to attenuate the negative impact of the lockdown. Families with spacious homes have probably better economic conditions and, consequently, more resources to provide their children with adequate treatment (medication or non-pharmacologic therapeutic support). Perhaps a bigger house and a higher socio-economic status allow children to benefit additionally from better e-learning conditions (privacy, tranquillity, a computer, and/or parental-based support).[8]

Moreover, children of parents on psychiatric follow-up were reported to have worsened symptoms. Several possible concerns arise in this regard:

- Has parents psychiatric treatment been somehow compromised due to the lockdown?
- Did these parents find it harder to conciliate their remote working with their children's e-learning?

The literature has long suggested a particular vulnerability among children of psychiatric patients.[17] These results portray the importance of paying attention to parents mental health in the promotion of children resilience.

In addition, symptoms of children on psychiatric medication were perceived to have deteriorated during the lockdown. Perhaps they discontinued their pharmacologic treatments, as some disorders such as attention-deficit / hyperactivity disorder are sometimes treated with medication mainly on school days. Another hypothesis is that these children might suffer from more severe psychiatric conditions, which impair their ability to cope with the pandemic.

Surprisingly, the condition of children in families with no history of COVID-19 cases might have deteriorated in isolation, as opposed to those in families with such a history. Perhaps the COVID-19 tracing services were considered to attract more attention to the family and affect the parental perception of isolation. However, more studies are needed to establish this finding.

Several limitations should be considered in the interpretation of these results. The study design does not allow any causal conclusions on the relationship between the fragility or resilience factors and the mental health outcomes. Moreover, the questionnaire used in this study might have limited strength and reliability due to the lack of validation and standardization. Furthermore, subjective parental perceptions can be prone to misinterpretation and recall bias. At the same time, a three-point scale is short and simplistic, and different parents could have reported the same perception differently. The heterogeneity of the sample may also bias results.

Based on the obtained results, some fragility and resilience factors affect the impact of the lockdown on the mental health of children with psychiatric conditions. Female gender, younger age, longer screen time, housing quality, household instability, family conflicts, and parental psychiatric disorders appear to affect this impact negatively.

Efforts should be directed towards prevention along with interventions that are focused on the specific mental health needs of this population. These interventions should focus on promoting resilience among these children and their families, as well as reducing their fragilities whenever possible. These findings should help to direct interventions. Further studies are needed to maximize this impact and understand the long-term consequences.

Author Contribuitions

NSD, MTM, DS, HB and BPF participated in the study conception or design. NSD, MTM, DS, HB, SP and RA participated in acquisition of data. NSD, MTM and DS participated in the analysis or interpretation of data. NSD and MTM participated in the drafting of the manuscript. NSD participated in the critical revision of the manuscript. All authors approved the final manuscript and are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Conflicts of Interest

The authors declare that there were no conflicts of interest in conducting this work.

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Protection of human and animal subjects

The authors declare that the procedures followed were in accordance with the regulations of the relevant clinical research ethics committee and with those of the Code of Ethics of the

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The authors declare that they have followed the protocols of their work centre on the publication of patient data.

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Impacto da Pandemia de Doença do Coronavírus 2019 na Saúde Mental de Criançascom Doenças Psiquiátricas

Introdução: O primeiro confinamento total devido à pandemia de coronavírus em Portugal teve início em março de 2020 e enviou para casa todas as crianças, para regressarem às escolas apenas em setembro desse mesmo ano. Pensa-se que as crianças terão maior dificuldade em lidar com esta pandemia, mas pouco se sabe relativamente àquelas com doença psiquiátrica.

Métodos: Entrevistámos os pais de 196 crianças em seguimento em consulta de pedopsiquiatria na Clínica da Encarnação, uma unidade de pedopsiquiatria do Centro Hospital Universitário Lisboa Central e reportamos a sua perceção do impacto do confinamento na saúde mental das suas crianças, bem como nas famílias.

Resultados: Os pais relataram uma ligeira deterioração da doença psiquiátrica e da sintomatologia, em particular da irritabilidade e ansiedade. Identificámos vários fatores de fragilidade importantes, como o sexo feminino, ano escolar baixo, maior tempo diário de exposição a monitores, pior qualidade de habitação, precaridade laboral dos pais, doença psiquiátrica parental, tratamento psicofarmacológico e menor tempo de seguimento em consulta. Encontrámos também alguns fatores de resiliência, como casos de doença do coronavirus 2019 na família, retenção escolar, sexo masculino e menor tempo de exposição a monitores. Os pais que reportaram uma deterioração dos conflitos familiares também reportaram pior impacto na doença psiquiátrica dos filhos.

Discussão: Os resultados sugerem um impacto heterogéneo na sintomatologia psiquiátrica desta população. Deverão ser feitos esforços no sentido da prevenção e intervenção. Os factores de fragilidade e resiliência identificados deverão direcionar estas intervenções.

Palavras-Chave: Comportamento Infantil/psicologia; COVID-19/psicologia; Criança; Inquéritos e Questionários; Pandemias; Perturbações Mentais/epidemiologia; Portugal; Quarentena/psicologia; Saúde Mental; Stress Psicológico/etiologia