



Article

Did Children in Single-Parent Households Have a Higher Probability of Emotional Instability during the COVID-19 Pandemic? A Nationwide Cross-Sectional Study in Japan

Takuto Naito ¹, Yasutake Tomata ^{2,3,*}, Tatsui Otsuka ⁴, Kanami Tsuno ⁵ and Takahiro Tabuchi ⁶

¹ Department of Global Public Health, Karolinska Institutet, 171 77 Stockholm, Sweden; takuto.naito@stud.ki.se

² School of Nutrition and Dietetics, Faculty of Health and Social Services, Kanagawa University of Human Services, Yokosuka 238-8522, Japan

³ Department of Medical Epidemiology and Biostatistics, Karolinska Institutet, 171 77 Stockholm, Sweden

⁴ Department of Psychiatry, Tohoku University Graduate School of Medicine, Sendai 980-8574, Japan; otsuka@med.tohoku.ac.jp

⁵ School of Health Innovation, Kanagawa University of Human Services, Kawasaki 210-0821, Japan; k.tsuno-wm4@kuhs.ac.jp

⁶ Cancer Control Center, Osaka International Cancer Institute, Osaka 541-8567, Japan; tabuti-ta@mc.pref.osaka.jp

* Correspondence: toomata-5h0@kuhs.ac.jp; Tel.: +81-046-828-2500

Abstract: The influence of public health measures against COVID-19 in Japan on child mental health by household type is unknown. This study aimed to investigate whether COVID-19 and the declaration of a state of emergency in Japan affected children's mental health between single-parent and two-parent households disproportionately. A large cross-sectional online survey was conducted from August to September 2020. The study included 3365 parents with children aged 0–14 years old who reported their children's mental status during the declared state of emergency. Emotional instability was reported dichotomously by parents. As the primary result, the probability of emotional instability was higher in single-parent households compared with that in two-parent households after adjustments for potential covariates; the adjusted prevalence ratio (95% CI) was 1.26 (1.07–1.49). Our findings suggest a disproportionate impact on children's mental health due to the pandemic.

Keywords: single-parent; COVID-19; children; mental health; Japan



Citation: Naito, T.; Tomata, Y.; Otsuka, T.; Tsuno, K.; Tabuchi, T. Did Children in Single-Parent Households Have a Higher Probability of Emotional Instability during the COVID-19 Pandemic? A Nationwide Cross-Sectional Study in Japan. *Int. J. Environ. Res. Public Health* **2022**, *19*, 4239. <https://doi.org/10.3390/ijerph19074239>

Academic Editor: Paul B. Tchounwou

Received: 20 February 2022

Accepted: 30 March 2022

Published: 1 April 2022

Publisher's Note: MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



Copyright: © 2022 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

1. Introduction

Since December 2019, coronavirus disease 2019 (COVID-19) has brought about disastrous impacts globally [1]. Several public health measures to deter the pandemic, including lockdowns, mass screening and contact tracing, have been adopted since early 2020 [2]. The lockdown and social distancing measures substantially affected the lives of both adults and children. According to UNESCO, more than 80% of students worldwide experienced school closures in April 2020 [3].

As in other countries and regions, a rapid increase in the number of COVID-19 cases urged the Japanese government to request that all elementary schools, junior high schools, high schools and special needs schools close from 2 March 2020, until the end of March, 2020 [4,5]. On the basis of the request, 99% of the schools in Japan closed until the beginning of April 2020 [6]. However, the government declared a state of emergency in seven populated prefectures, such as Tokyo, on 7 April 2020. The government, in turn, requested schools in the prefectures affected to close again [7]. Subsequently, the declaration of a state of emergency was announced on 16 April 2020. Therefore, all elementary schools, junior high schools, high schools and special needs schools were again encouraged to close [8]. The declaration was lifted on 25 May 2020. Virtually, many students experienced almost a 3-month school closure.

During the school closure, many schools continued to offer learning opportunities for children. However, online classes were not common in the Japanese compulsory educational system before the COVID-19 pandemic. Hence, the online schooling was rather Emergency Remote Teaching (ERT) than planned online education. ERT is defined as “a temporary shift of instructional delivery to an alternate delivery mode due to crisis circumstances” [9]. In Japan, a local educational committee settled in each municipality is responsible for education provision at municipality-owned schools, which account for most of the public education in Japan, and educational corporations are responsible at private schools. A nationwide survey conducted by the Ministry of Education, Culture, Sports, Science and Technology on 16 April 2020, revealed that 60 of 1213 local educational committees (5%) provided real-time interactive education via online platforms, 118 (10%) developed original lecture videos, 353 (29%) took advantage of other digital textbooks and materials and 288 (24%) utilized television programs [10].

Children in single-parent households in Japan faced challenges not only economically but also physically or mentally even before the COVID-19 pandemic. Single mothers in Japan more frequently reported severe living conditions and psychological distress than two-parent mothers [11]. Japanese adolescents in single-parent households are more likely to experience psychological distress than two-parent households [12].

Furthermore, the pandemic possibly affected single-parent and two-parent households disproportionately [13]. A previous study in Hong Kong suggests that single-parent families are more prone to being adversely affected by COVID-19 and related social restrictions [14]. However, to the best of our knowledge, no study examined the influence of the COVID-19 pandemic on children’s mental health in Japan by household type.

This study aimed to investigate whether COVID-19 and the first declaration of a state of emergency in Japan affected children’s mental health by comparing single-parent and two-parent households. Second, we explored environmental and behavioral factors associated with children’s emotional instability.

2. Materials and Methods

2.1. Study Design

This cross-sectional study used data on children aged 0–14 years old (information provided by their parents) from the Japan “COVID-19 and Society” Internet Survey (JACSIS) study. The JACSIS study is based on a self-administered web questionnaire survey distributed through a commercial research agency ((Rakuten Insight, Inc., Tokyo, Japan), which had approximately 2.2 million qualified panelists in 2019). Invitation to the survey was sent via e-mail to the panelists. The invitation and the questionnaire were only in Japanese.

The questionnaires were distributed to 224,389 panelists selected by sex, age and residential area (47 prefectures in Japan) based on the random sampling method. Japanese people who lived in other countries were not allowed to participate. The panelists who agreed to answer the survey accessed the designated website and responded to the questions. Options were available to skip some questions or discontinue participation during the survey. Recruitment was started on 25 August 2020 and was completed on 30 September 2020.

When the respondents had multiple children, we asked them to answer the status of only one child among them. The priority among target children was allocated as follows (highest to lowest in order): a child at a higher grade at primary school (10–12 years old); a child at a lower grade at primary school (6–9 years old); a child at junior high school (13–14 years old); and a child before primary school (0–5 years old). With the structural constraint of the web survey, we were restricted to inquiring about only one of the participants’ children. As the JACSIS survey collectively included many questions related to the parent–child relationship, we prioritized the age groups that could be more profoundly influenced by the parent–child relationship. Our assumption was that children younger than teenagers, namely, younger than 12 years old (i.e., younger than the age of

junior high school students) would be more substantially affected than teenagers because teenagers are more likely to be independent from their parents. On the other hand, it would be presumably challenging to assess emotional and behavioral changes among infants and pre-school children; therefore, we assigned the lowest priority to infants and pre-school children. In addition to these assumptions, we supposed children of 10–12 years old were likely to independently participate in more extra-curricular activities and leisure activities than 6–9-year-old children. Accordingly, 10–12-year-olds were the ideal age group to be analyzed, and we prioritized this group first.

2.2. Study Population

Among the recruited respondents, we excluded individuals who reported unnatural or inconsistent responses using an algorithm shared in JACSIS studies [15]. We excluded respondents who reported that they had no child, or all their children were over 14 years old. Then, we excluded outliers who were younger than the age at which people are legally allowed to marry in Japan, that is, 18 years old for men and 16 years old for women. Furthermore, respondents with two or more children of the same age were excluded because we could not identify which child the participants answered for in the questions of interest. Moreover, we excluded respondents who reported that they had more than five children because the maximum number of children that the respondents could in the survey was five due to the survey structure as they might have failed to provide the appropriate outcome information about children in the prioritized age groups. Lastly, we excluded respondents who did not provide valid information about the primary outcome variable (i.e., they responded “do not know” or “not relevant” to the statement “my child became emotionally unstable”).

2.3. Outcome (Emotional Instability)

As the primary outcome variable, we asked the parents about their children’s emotional instability during the two months from April to May 2020 (i.e., the period of the first state of emergency in Japan, when schools, nurseries and kindergartens were requested to close). The statement “my child became emotionally unstable” was responded to with any one of “yes”, “no”, “do not know”, or “not relevant”. “Yes” was defined as the presence of emotional instability, while “no” was defined as no emotional instability.

As secondary outcome measures, we measured child misbehaviors that can be deemed consequences of children’s emotional instability. Child misbehaviors included violence, abusive language towards others, demotivation to study and school absenteeism during the same two months. We asked the parents whether they agreed with the following statements: “my child perpetrated violence”, “my child spoke abusive words”, “my child was demotivated to study” and “my child stopped going to school”; the parents responded any one of “yes”, “no”, “do not know”, or “not relevant”. “Yes” was defined as the perpetration of the behaviors, while “no” was defined as no perpetration.

2.4. Exposure (Single-Parent)

The primary exposure variable was the family type defined by self-reported number of spouses (0 or 1). Respondents who answered no spouse were defined as “single-parent households”, and the other respondents were defined as “two-parent households”.

Children’s environment and extracurricular activities included school and nursery closures, online education in April and May 2020, childcare by others (i.e., relatives and childcare services) due to school and nursery closure, and extracurricular activity participation (i.e., cram schools and sport/hobby lessons), which were reported by either “yes” or “no”.

The daily activities of their children were reported in the following categories: sleeping, studying, physical activity, reading, watching TV and online entertainment and playing games. We asked the parents to select one of the following alternatives that specify the hours spent per day carrying out each of the abovementioned activities: 0, less than 30 min,

about 30 min, 1 h, 2 h, 3 h, 4–5 h, 6–7 h, 8–9 h, 10–11 h, ≥ 12 h and do not know. We then described the proportion of the children in the following groups: 8 h or longer for sleep, 1 h or longer for study, 0.5 h or longer for physical activity, 0.5 h or longer for reading, 2 h or longer for watching TV and online entertainment and 1 h or longer for playing games.

2.5. Covariates

We included the following covariates: parents' age, socioeconomic status and whether they lived with a grandparent. As a socioeconomic status, we included: educational attainment (graduated from college or higher institutions and high school or lower institutions); household income level (categorized using the tertiles of household equivalent income ("low" = less than 2.5 million JPY; "medium" = 2.5 to 4.3 million JPY; and "high" = more than 4.3 million JPY), and "not responded"); the number of family members (≤ 3 , 4 and ≥ 5); and employment status (employer, self-employed, regular employee, non-regular employee, and unemployed). The household equivalized income was calculated as the self-reported gross (pre-tax) income in 2019, divided by the square root of the number of household members. Whether they lived with a grandparent was dichotomously categorized (yes/no) based on the self-reported number of grandparents living with them.

2.6. Statistical Analysis

We performed a descriptive analysis of covariates according to family type. We used Chi-square tests to test the differences in categorical variables and the Mann–Whitney test for parents' age because the distribution of parents' age was not assumed as normal distribution.

We calculated the prevalence ratio and 95% confidence interval (95% CI) of emotional instability using Poisson regression with robust variance to examine the association between the family type and children's emotional instability [16]. Adjustment items for multivariable logistic regression models were respondents' age groups (15–19, 20–29, ... and 70–79), educational attainment, household income, employment status and whether they lived with a grandparent. For two-parent families, as one of the two parents reported all the information, we adjusted for the covariates based on the information from the responding parent only. For sensitivity analyses, we conducted stratified analyses of the following items: children's age, children's environment (i.e., school/nursery closure, online education and childcare by others), extracurricular activities (i.e., cram schools and sports/hobby lessons) and daily activities (i.e., sleep ≥ 8 h, study ≥ 1 h, physical activity ≥ 30 min, reading ≥ 30 min, watching TV and online entertainment ≥ 2 h and playing games ≥ 1 h). As for the stratified analyses, we excluded the respondents who did not provide valid information necessary for stratification as we could not classify them into either of the two groups. In addition, to test the interaction effects, we performed adjusted generalized linear model analyses with an interaction term of stratification variables (i.e., the child age category \times child environment or child extracurricular activities).

We performed the analyses using STATA version 16.1. We considered two-sided p -values < 0.05 as statistically significant.

3. Results

3.1. Characteristics

During the study period, 29,000 respondents (response rate 12.9%) answered the questionnaires. We excluded 2601 individuals who reported unnatural or inconsistent responses using an algorithm we developed, which left 26,399 respondents (91.0% of the total survey respondents). Among the 26,399 respondents, we excluded 21,124 respondents who reported that they had no child ($n = 16,899$), or that all their children were over 14 years old ($n = 4225$). Then, we excluded 19 outliers who were younger than the age at which people are allowed to be legally married, that is, 18 years old for men ($n = 15$) and 16 years old for women ($n = 4$). Furthermore, 96 respondents with two or more children of the same age were excluded because we could not assume which child the participants answered for in the questions of interest. Moreover, we excluded seven respondents who reported

that they had more than five children because the maximum number of children that the respondents could answer for was five due to the survey structure as they might have failed to provide the appropriate outcome variable; we thus included 5153 respondents at this step. Lastly, we excluded 1788 respondents due to invalid primary-outcome information. As a result, we analyzed 3365 participants in the present study (Figure 1).

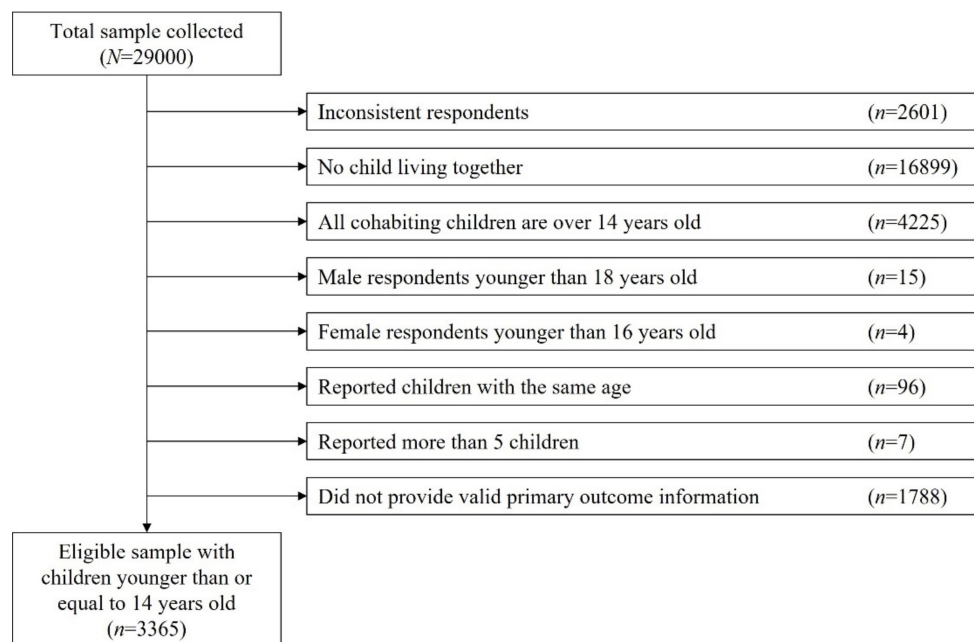


Figure 1. Flow chart of the study population.

Among 3365 participants, 762 (22.6%) were single parents (Table 1). The proportion of female respondents was 49.2% in two-parent households and 90.0% in single-parent households. The mean parent age was younger among single-parent households. Educational attainment and household income level tended to be higher among two-parent households. The proportion of non-regular employees was higher among single-parent households. The proportion of the youngest child age group (0–5 years old) was higher among two-parent households.

Table 1. Parent and child characteristics by family type (n = 3365).

	Family Type			p
	Two-Parent (n = 2603)	Single-Parent (n = 762)	Total (n = 3365)	
Response from mother, %	49.2	90.0	58.5	<0.01 ³
Age, mean (SD)	40.7 (7.4)	39.7 (6.7)	40.5 (7.2)	<0.01 ⁴
Educational attainment, %				<0.01 ³
High school or lower	19.5	32.0	22.3	
College or higher	80.4	67.6	77.5	
Household income level, % ¹				<0.01 ³
Higher	23.3	8.8	20.0	
Intermediate	43.9	17.2	37.8	
Lower	21.9	60.6	30.7	
Not answered	10.9	13.4	11.4	
Number of children, mean (SD)	1.85 (0.75)	1.57 (0.75)	1.79 (0.76)	<0.01 ⁴
Number of family member, % ²				<0.01 ³
≤3 persons	32.3	65.4	39.8	
4 persons	46.9	18.0	40.4	
≥5 persons	20.7	16.7	19.8	

Table 1. Cont.

	Family Type		Total (<i>n</i> = 3365)	<i>p</i>
	Two-Parent (<i>n</i> = 2603)	Single-Parent (<i>n</i> = 762)		
Employment status, %				<0.01 ³
Employer	3.6	2.9	3.5	
Self-employed	3.8	4.3	3.9	
Regular employee	54.4	52.2	53.9	
Non-regular employee	17.1	32.8	20.7	
Unemployed	21.1	7.7	18.1	
Living with a grandparent, %	7.7	32.4	13.3	<0.01 ³
Children's age group, % ⁵				<0.01 ³
0–5 years old	30.7	18.2	27.9	
6–9 years old	28.1	25.6	27.5	
10–12 years old	30.5	36.6	31.9	
13–14 years old	10.7	19.6	12.7	
School/nursery closure, %				0.07 ³
Open	12.3	13.5	12.6	
Closed	76.0	77.7	76.3	
Not answered	11.7	8.8	11.1	
Online education				0.41 ³
No	65.8	67.5	66.2	
Yes	31.8	30.8	31.6	
Not answered	2.4	1.7	2.3	
Childcare by others, %				<0.01 ³
No	20.2	27.2	21.8	
Yes	1.8	1.6	1.8	
Not answered	7.1	5.4	6.7	
Extracurricular activity participation				
cram school, %				0.56 ³
No	17.6	17.5	17.6	
Yes	1.6	1.0	1.5	
Not answered	6.4	4.2	5.9	
Sport/hobby lessons, %				0.37 ³
No	81.1	83.1	81.5	
Yes	17.9	16.3	17.6	
Not answered	1.0	0.7	0.9	
Daily activities, %				
Sleep: ≥8 h	81.9	79.7	81.4	0.32 ³
Study: ≥1 h	49.5	50.9	49.8	<0.01 ³
Physical activity: ≥30 min	53.5	40.0	50.5	<0.01 ³
Reading: ≥30 min	39.3	33.3	37.9	<0.01 ³
Watching TV/online entertainment: ≥2 h	44.4	50.8	45.9	<0.01 ³
Game: ≥1 h	43.0	53.1	45.3	<0.01 ³

Notes: SD = standard deviation. ¹ As equalized household income, “low” = less than 2.5 million JPY; “medium” = 2.5 to 4.3 million JPY; and “high” = more than 4.3 million JPY. ² Including respondents. ³ We performed Chi-square tests for categorical variables. ⁴ We performed a Mann–Whitney test. ⁵ The proportion of the target child age group is shown.

During the state of emergency declaration, the proportion of childcare by others was higher among single-parent households (Table 1). While more single parents reported school and nursery closure than married parents, educational opportunities and online and cram schools were not significantly different between single-parent and two-parent children.

Overall, children in single-parent households spent a shorter time carrying out physical activities and reading, and spent a longer time studying at home, watching television and online entertainment and playing games than those in two-parent families (Table 1). On the

other hand, sleeping hours were not significantly different. The distribution of the daily activities by child age group is shown in Table A1 (Appendix A).

Within two-parent households, the covariates, namely, the respondents' age, household income level and educational attainment were significantly different according to respondents' gender, except for the status of living with a grandparent (Table A2).

3.2. Children's Emotional Instability

As the primary result in the present study, the probability of emotional instability was higher in single-parent households compared with that in two-parent households; the adjusted prevalence ratio (95% CI) was 1.26 (1.07–1.49) (Table 2).

Table 2. Association between family type and children's outcome (emotional instability and misbehaviors) ($n = 3358$).

	Total Number	Prevalence	Crude PR (95% CI)	Adjusted PR (95% CI) ¹
Emotional instability				
Two-parent	2603	17.8%	Reference	Reference
Single-parent	762	23.1%	1.30 (1.11–1.51)	1.26 (1.07–1.49)
Violence towards others				
Two-parent	2603	6.7%	Reference	Reference
Single-parent	762	7.1%	1.06 (0.79–1.42)	1.01 (0.74–1.38)
Abusive language towards others				
Two-parent	2603	14.3%	Reference	Reference
Single-parent	762	19.0%	1.35 (1.13–1.60)	1.23 (1.02–1.49)
Demotivation to study				
Two-parent	2603	26.2%	Reference	Reference
Single-parent	762	35.8%	1.35 (1.21–1.51)	1.37 (1.22–1.55)
Absenteeism				
Two-parent	2603	3.6%	Reference	Reference
Single-parent	762	6.8%	1.83 (1.32–2.54)	1.72 (1.17–2.53)

Notes: PR = prevalence ratio; 95% CI = 95% confidence interval. ¹ Adjusted for respondents' age group, educational attainment, household income and whether they lived with a grandparent.

As the results of analyses using secondary outcomes, we observed similar trends, with the main result being that children in single-parent households were more likely to use abusive language towards others, become demotivated to study and be absent from school but not perpetrate violence towards others (Table 2).

When we stratified by children's age, among the 13–14-year-old group, the prevalence ratio of children's emotional instability in single-parent households was statistically significantly higher than that of two-parent households (Table 3). However, we did not observe a significant interaction between children's age and family type (p -interaction = 0.49, 0.74 and 0.54 in 6–9-year-old, 10–12-years-old and 13–14-year-old groups, respectively). The stratification for children's age of the secondary outcome analyses also showed the trend of increasing prevalence ratios with the increase in the children's age, except regarding violence towards others (Table A3). We found the interaction between family type and the children's age of 13–14 years old to be insignificant.

Table 3. Family type and children’s emotional instability: stratified by children’s age ($n = 3358$).

Children’s Age Group	Total Number	Prevalence of Emotional Instability	Crude PR (95%CI)	Adjusted PR (95% CI) ¹	p -Interaction ²
0–5 years old					Reference
Two-parent	1557	6.9%	Reference	Reference	
Single-parent	271	8.5%	1.22 (0.81–1.85)	1.13 (0.72–1.77)	
6–9 years old					0.49
Two-parent	1028	15.1%	Reference	Reference	
Single-parent	275	15.3%	1.02 (0.75–1.37)	0.93 (0.67–1.30)	
10–12 years old					0.74
Two-parent	1054	14.3%	Reference	Reference	
Single-parent	382	18.6%	1.34 (1.04–1.71)	1.20 (0.91–1.57)	
13–14 years old					0.54
Two-parent	377	13.5%	Reference	Reference	
Single-parent	213	18.8%	1.47 (1.02–2.11)	1.68 (1.13–2.49)	

Notes: PR = prevalence ratio; 95% CI = 95% confidence interval. ¹ Adjusted for respondents’ age group, educational attainment, household income and whether they lived with a grandparent. ² Two-parent and 0–5 years were used as the reference to assess p values of the interaction between family type and children’s age group.

3.3. Stratifying by Environment and Daily Activities

Table 4 shows the results of stratified analyses according to environment based on the association between children’s emotional instability and the p -value of the interaction terms between the family type and environment. Among those who experienced school or nursery closure, single-parent children had a higher prevalence ratio of emotional instability than two-parent children; the adjusted prevalence ratio was 1.24 (1.04–1.48). On the contrary, children who attended school or nursery did not show a significant prevalence ratio of emotional instability between two-parent and single-parent households.

Table 4. Family type and children’s emotional instability: stratified by children’s environment and extracurricular activity.

	Total Number	Prevalence of Emotional Instability	Crude PR (95%CI)	Adjusted PR (95%CI) ¹	p -Interaction ²
School/nursery					0.87
Open					
Two-parent	391	7.7%	Reference	Reference	
Single-parent	120	10.0%	1.25 (0.66–2.35)	1.03 (0.51–2.08)	
Closed					
Two-parent	2518	15.6%	Reference	Reference	
Single-parent	781	19.5%	1.29 (1.10–1.52)	1.24 (1.04–1.48)	
Online education					0.83
No					
Two-parent	2844	9.3%	Reference	Reference	
Single-parent	816	12.6%	1.30 (1.06–1.59)	1.25 (1.00–1.56)	
Yes					
Two-parent	1027	18.2%	Reference	Reference	
Single-parent	295	24.4%	1.36 (1.08–1.71)	1.31 (1.02–1.69)	

Table 4. Cont.

		Total Number	Prevalence of Emotional Instability	Crude PR (95%CI)	Adjusted PR (95%CI) ¹	<i>p</i> -Interaction ²
Childcare by others						0.42
No	Two-parent	3194	9.9%	Reference	Reference	
	Single-parent	833	13.1%	1.29 (1.06–1.57)	1.28 (1.04–1.58)	
Yes	Two-parent	676	20.7%	Reference	Reference	
	Single-parent	273	23.1%	1.14 (0.89–1.47)	1.03 (0.78–1.37)	
Cram school						0.89
No	Two-parent	3303	10.6%	Reference	Reference	
	Single-parent	940	13.9%	1.27 (1.06–1.52)	1.27 (1.04–1.55)	
Yes	Two-parent	584	19.2%	Reference	Reference	
	Single-parent	172	25.0%	1.32 (0.99–1.78)	1.14 (0.83–1.56)	
Sport/hobby lessons						0.98
No	Two-parent	3338	10.4%	Reference	Reference	
	Single-parent	972	13.9%	1.30 (1.09–1.55)	1.28 (1.05–1.55)	
Yes	Two-parent	576	20.0%	Reference	Reference	
	Single-parent	144	27.1%	1.28 (0.94–1.73)	1.21 (0.87–1.67)	

Notes: PR = prevalence ratio; 95% CI = 95% confidence interval. ¹ Adjusted for respondents' age group, educational attainment, household income and whether they lived with a grandparent. ² Two-parent and open school or nursery and "No" to each activity were used as the reference of the interaction terms.

Furthermore, Table 5 shows the results of stratified analyses according to children's daily activities based on the association between children's emotional instability and *p*-values of the interaction terms between the family type and daily activities. Among children who had shorter sleeping hours, a shorter reading time, a longer screen time and who spent a longer time playing games, children living in single-parent households had higher prevalence ratios of emotional instability than those in two-parent households.

Table 5. Family type and children's emotional instability: stratified by children's daily activities.

Emotional Instability		Total Number	Prevalence of Emotional Instability	Adjusted PR (95%CI) ¹	<i>p</i> -Interaction ²
Sleep					0.07
<8 h	Two-parent	422	18.2%	Reference	
	Single-parent	137	30.7%	1.66 (1.15–2.40)	
≥8 h	Two-parent	2133	17.9%	Reference	
	Single-parent	607	21.4%	1.16 (0.96–1.40)	

Table 5. Cont.

Emotional Instability		Total Number	Prevalence of Emotional Instability	Adjusted PR (95%CI) ¹	<i>p</i> -Interaction ²
Study					0.47
	<1 h	Two-parent Single-parent	803 288	19.2% 25.7%	Reference 1.38 (0.98–1.94)
	≥1 h	Two-parent Single-parent	1289 388	19.2% 23.5%	Reference 1.21 (0.90–1.62)
Physical activity					0.80
	<30 min	Two-parent Single-parent	1101 430	20.0% 24.4%	Reference 1.31 (0.98–1.74)
	≥30 min	Two-parent Single-parent	1393 305	16.8% 21.6%	Reference 1.27 (0.91–1.78)
Reading					0.53
	<30 min	Two-parent Single-parent	1486 482	17.7% 22.2%	Reference 1.36 (1.03–1.78)
	≥30 min	Two-parent Single-parent	1022 254	18.8% 26.0%	Reference 1.36 (0.96–1.92)
Watching TV/online entertainment					0.15
	<2 h	Two-parent Single-parent	1364 351	15.2% 16.5%	Reference 1.11 (0.79–1.57)
	≥2 h	Two-parent Single-parent	1156 387	21.4% 28.9%	Reference 1.43 (1.07–1.89)
Game					0.18
	<1 h	Two-parent Single-parent	1396 331	15.8% 17.2%	Reference 1.08 (0.77–1.52)
	≥1 h	Two-parent Single-parent	1120 405	20.8% 27.9%	Reference 1.42 (1.06–1.89)

Notes: PR = prevalence ratio; 95% CI = 95% confidence interval. ¹ Adjusted for respondents' age group, educational attainment, household income and whether they lived with a grandparent. ² Two-parent and shorter time of each activity were used as the reference of the interaction terms.

4. Discussion

This study aimed to investigate the impact of family type (single-parent and two-parent households) on children's emotional instability during the COVID-19 outbreak in Japan. The probability of emotional instability was higher in single-parent households. Additionally, changes in children's environments due to the pandemic, such as school or nursery closure, affected children's emotional stability disproportionately according to family type. To the best of our knowledge, this is the first cross-sectional study to investigate the impact of single-parent households on children's mental status during the COVID-19 pandemic in Japan.

The association between family type and emotional instability was consistently evident in terms of both parent-reported emotional status and perceived misbehavior. Misbehaviors, namely, violence towards others, abusive language towards others, demotivation to study and absenteeism, reflect children's mental health problems [17–20]. The trend was pronounced among children aged 13–14 years old (i.e., junior high school age). If this emotional instability leads to or is a symptom of depression, this trend will be a severe

problem because depression is associated with devastating consequences, such as poor academic performance [21] and suicide [22,23] in this life stage. Although the present study did not investigate the severity of children's mental status, the trajectory in children's psychosocial conditions, especially in single-parent households, would be exacerbated if the social situation for children remained devastated by the COVID-19 pandemic.

The results of the stratified analyses suggested several considerable effect modifiers regarding the association with children's emotional instability. For example, the adjusted prevalence ratios of emotional instability among the children who could not go to school or nursery were higher than those among the children who did. On the contrary, we observed a higher adjusted prevalence ratio of emotional instability among single-parent children both with and without online education. This result suggests that the online educational opportunities did not mitigate the risk of a deteriorating emotional status among single-parent children, even though children could communicate with their teachers and keep learning. Moreover, over 30% of the parents reported that their children had opportunities to access online education. However, children who accessed online education showed a higher prevalence of mental instability among both family types. There may be a lack of transferring school functions. Therefore, online classes might have exacerbated children's anxiety. Of note, the impact of online education, including ERT, reported to date is heterogeneous. Even with remote learning opportunities, school closure contributes to increased anxiety and loneliness among adolescents and emotional instability among children [17]. On the other hand, there was no association between ERT and children's risk for anxiety, depression and obsessive compulsive disorder during the six months from April 2020 to October 2020 in Florida, USA [24]. These findings support that the opening of schools and nurseries could lessen the negative effect of family type on children's emotional instability. Schools can serve as mental health care providers for children and adolescents [18]. Without schools or nurseries, children may have lacked holistic support that would have been otherwise provided. According to a national survey, only 20% of the municipalities opened consultation counters designated for children, and 59% secured places in schools for children [10]. The lack of contact with adults other than their family or physical locations apart from their homes could have influenced children's emotional states. Even without classes or formal education, maintaining occasional connection between teachers and children via telephone or online tools could have a beneficial effect on children's emotional states, especially among those with less parental support or financial hardship, since they are likely to be at a high risk of mental problems [20]. Additionally, there are some public resources, such as toll-free hotlines, designated specifically for children in Japan [25,26]. These measures should have been more advertised through the educational system. Given the burden on schools, more rigorous, nationwide support for offering comprehensive care is required to safeguard children in terms of mental health in case of school closure.

Some daily activities, namely, shorter sleeping hours, a longer time watching TV and online entertainment and a longer time playing games were also considerable effect modifiers regarding the association with children's emotional instability. Apart from household types, sleep and playing games are suggested to be associated with psychological problems among children during the COVID-19 pandemic [14,27]. Our findings suggested that children who spent more than 2 h watching TV and online entertainment showed a higher prevalence of emotional instability in both two-parent and single-parent households than children who spent less than 2 h on these activities. Additionally, single-parent households were associated with a higher prevalence ratio of emotional instability only among children who spent a longer time watching TV and online entertainment. This finding was aligned with prior reports that a longer screen time was associated with psychosocial problems [28,29].

There are some limitations of the present study. First, this was a cross-sectional study; hence, we cannot infer any causal links between household types and children's mental status. Data on the target children's mental health before or after the pandemic were not

available. This made it challenging to assess whether children's mental instability was associated solely with the pandemic and its related countermeasures. However, we asked parents whether their children "became" mentally unstable during the declaration of a state of emergency, instead of "were," to reduce the possibility of capturing an already worsened mental status since before the declaration. The fact that no prior research has investigated mental instability by family type in Japan might highlight the significance of this study. Second, the misclassification of children's emotional status is a concern because this status was reported by their parents, not by children themselves. If parental reporting caused non-differential misclassification, our main findings were likely underestimated. Third, the adjustment of multivariable regression analysis was performed according to the covariates reported by only one of the two parents among two-parent households. As shown in Table A2, it is likely that fathers and mothers belonged to different age categories and educational backgrounds. Fourth, there was a limitation in the generalizability of our findings due to the study design. As this survey was commercial- and web-based, participants were likely familiar with internet use and online surveys. Participation was voluntary and compensated with a small benefit (provided via points used as cash in Rakuten service), so that they had spare time for voluntary activities. Prior studies from JACSIS adopted a weighting method to adjust responses to improve generalizability [15]; however, a weighting score was not available in the 1000 single-parent respondents in the present study. Fifth, a limited number of single fathers were recruited in this study. Only 76 out of 762 (10.0%) single parents were males among the eligible sample ($n = 3365$). Nevertheless, the proportion was not far from the national proportion of fathers among single parents in Japan, 11.2% according to the census in 2017 [30]. Hence, we believe that the gender balance in the present study reflected the current circumstances in Japan. Lastly, the JACSIS questionnaire did not ask for the children's gender, which might affect their emotional instability. However, children's gender was not likely to have affected their parents' participation in this study, and therefore, we can assume that there was no significant gender disproportion among the analyzed children.

5. Conclusions

A large-scale cross-sectional internet survey in Japan indicated that children in single-parent households were more likely to be emotionally unstable than those in two-parent households during the declaration of a state of emergency in Japan. Our findings suggest a disproportionate impact of policies on children's health. Further investigation of the potential causes of youth health inequity is warranted, and policies that support young people under a pandemic or a state of emergency should be revisited.

Author Contributions: Conceptualization, T.N. and T.T.; methodology, T.N., Y.T., T.O., K.T. and T.T.; formal analysis, T.N.; investigation, T.T.; data curation, T.T.; writing—original draft preparation, T.N.; writing—review and editing, Y.T., T.O., K.T. and T.T.; project administration, T.T.; funding acquisition, Y.T. and T.T. All authors have read and agreed to the published version of the manuscript.

Funding: This study was supported by the Japan Society for the Promotion of Science (JSPS) KAKENHI Grants (grant numbers 17H03589, 19K10671, 19K10446, 18H03107, 18H03062, 19H03860 and 21H04856); the JSPS Grant-in-Aid for Young Scientists (grant number 19K19439); the Research Support Program to Apply the Wisdom of the University to tackle COVID-19 Related Emergency Problems, University of Tsukuba, Health Labour Sciences Research Grant (grant numbers 19FA1005, 19FG2001 and 19FA1012); the Japan Agency for Medical Research and Development (AMED; grant number 2033648); and the Individual Research Allowance at Kanagawa University of Human Services. The findings and conclusions of this article are the sole responsibility of the authors and do not represent the official views of the research funders.

Institutional Review Board Statement: This study was conducted according to the guidelines of the Declaration of Helsinki, and approved by the Institutional Review Board of the Osaka International Cancer Institute (No. 20084, 19 June 2020).

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The datasets used and analyzed during the current study are available from the corresponding author on reasonable request.

Acknowledgments: We appreciate valuable feedback from the JACSIS study group researchers.

Conflicts of Interest: The authors declare no conflict of interest.

Appendix A

Table A1. Daily activity trends of the children stratified by age group.

	Daily Activities, %	Two-Parent	Single-Parent	<i>p</i> -Value ¹
Total	Sleep \geq 8 h	81.9	79.7	0.32
	Study \geq 1 h	49.5	50.9	<0.01
	Physical activity \geq 30 min	53.5	40.0	<0.01
	Reading \geq 30 min	39.3	33.3	<0.01
	Watching TV/online entertainment \geq 2 h	44.4	50.8	<0.01
	Gaming \geq 1 h	43.0	53.1	<0.01
0–5 years old	Sleep \geq 8 h	88.7	83.5	0.14
	Study \geq 1 h	7.4	5.0	0.07
	Physical activity \geq 30 min	67.0	54.0	<0.01
	Reading \geq 30 min	35.4	24.5	0.04
	Watching TV/online entertainment \geq 2 h	37.2	30.2	0.22
	Gaming \geq 1 h	9.6	14.4	0.13
6–9 years old	Sleep \geq 8 h	87.8	89.2	0.30
	Study \geq 1 h	59.0	54.9	0.54
	Physical activity \geq 30 min	56.1	42.1	<0.01
	Reading \geq 30 min	40.4	34.4	0.27
	Watching TV/online entertainment \geq 2 h	40.9	44.6	0.55
	Gaming \geq 1 h	46.2	49.7	0.62
10–12 years old	Sleep \geq 8 h	80.0	79.9	0.23
	Study \geq 1 h	75.3	67.0	<0.01
	Physical activity \geq 30 min	44.8	36.9	0.01
	Reading \geq 30 min	45.2	38.4	0.04
	Watching TV/online entertainment \geq 2 h	50.0	57.0	0.07
	Gaming \geq 1 h	66.8	69.9	0.47
13–14 years old	Sleep \geq 8 h	52.7	63.1	0.07
	Study \geq 1 h	72.0	58.4	0.01
	Physical activity \geq 30 min	33.0	30.2	0.83
	Reading \geq 30 min	30.5	30.9	0.98
	Watching TV/online entertainment \geq 2 h	58.4	66.4	0.14
	Gaming \geq 1 h	62.7	62.4	1.00

¹ We performed Chi-square tests.

Table A2. Characteristics by gender among two-parent households.

	Respondents' Gender			<i>p</i>
	Male (<i>n</i> = 1322)	Female (<i>n</i> = 1281)	Total (<i>n</i> = 2603)	
Age, mean (SD)	42 (7.5)	39.4 (7)	40.7 (7.4)	<0.01 ³
Educational attainment, %				<0.01 ⁴
High school or lower	16.0	23.1	19.5	
College or higher	83.8	76.8	80.4	
Household income level, % ¹				<0.01 ⁴
Higher	28.1	18.4	23.3	
Intermediate	47.8	39.8	43.9	
Lower	17.5	26.5	21.9	
Not answered	6.7	15.2	10.9	
Number of children, mean (SD)	1.88 (0.74)	1.82 (0.76)	1.85 (0.75)	0.02 ³
Number of family member, % ²				0.04 ⁴
≤3 persons	30.1	34.7	32.3	
4 persons	48.7	45.1	46.9	
≥5 persons	21.2	20.2	20.7	
Employment status, %				<0.01 ⁴
Employer	6.3	0.9	3.6	
Self-employed	5.4	2.0	3.8	
Regular employee	84.9	22.8	54.4	
Non-regular employee	2.1	32.6	17.1	
Unemployed	1.2	41.6	21.1	
Living with a grandparent, %	8.7	6.7	7.7	0.06 ⁴

Notes: ¹ As equivalized household income, "low" = less than 2.5 million JPY; "medium" = 2.5 to 4.3 million JPY; and "high" = more than 4.3 million JPY. ² Including respondents. ³ We performed Mann–Whitney test. ⁴ We performed Chi-square tests for categorical variables.

Table A3. Family type and misbehaviors: stratified by children's age (*n* = 3358).

	Total Number	Prevalence	Crude PR (95% CI)	Adjusted PR (95% CI) ¹	<i>p</i> -Interaction ²
Violence towards others					
Children's age					
0–5 years old					Reference
Two-parent	1557	4.7%	Reference	Reference	
Single-parent	271	6.3%	1.37 (0.83–2.25)	1.43 (0.79–2.60)	
6–9 years old					0.37
Two-parent	1028	6.9%	Reference	Reference	
Single-parent	275	6.5%	0.99 (0.61–1.62)	0.99 (0.59–1.68)	
10–12 years old					0.71
Two-parent	1054	4.7%	Reference	Reference	
Single-parent	382	5.8%	1.21 (0.75–1.97)	1.01 (0.60–1.70)	
13–14 years old					0.32
Two-parent	377	3.4%	Reference	Reference	
Single-parent	213	2.8%	0.83 (0.32–2.15)	0.88 (0.36–2.18)	
Abusive language towards others					
Children's age					
0–5 years old					Reference
Two-parent	1557	5.8%	Reference	Reference	
Single-parent	271	8.5%	1.50 (0.98–2.28)	1.29 (0.80–2.09)	
6–9 years old					0.29
Two-parent	1028	14.8%	Reference	Reference	
Single-parent	275	16.0%	1.12 (0.83–1.51)	0.99 (0.71–1.37)	
10–12 years old					0.70
Two-parent	1054	14.6%	Reference	Reference	
Single-parent	382	19.6%	1.35 (1.06–1.71)	1.21 (0.93–1.57)	
13–14 years old					0.82
Two-parent	377	10.1%	Reference	Reference	
Single-parent	213	13.6%	1.38 (0.89–2.15)	1.45 (0.92–2.29)	

Table A3. Cont.

	Total Number	Prevalence	Crude PR (95%CI)	Adjusted PR (95%CI) ¹	<i>p</i> -Interaction ²
Demotivation to study					
Children's age					
0–5 years old					Reference
Two-parent	1557	2.8%	Reference	Reference	
Single-parent	271	2.6%	0.96 (0.44–2.07)	0.85 (0.39–1.85)	
6–9 years old					0.76
Two-parent	1028	25.8%	Reference	Reference	
Single-parent	275	27.6%	1.08 (0.88–1.32)	1.02 (0.82–1.27)	
10–12 years old					0.51
Two-parent	1054	33.5%	Reference	Reference	
Single-parent	382	42.1%	1.25 (1.09–1.42)	1.25 (1.08–1.44)	
13–14 years old					0.47
Two-parent	377	34.0%	Reference	Reference	
Single-parent	213	42.3%	1.26 (1.05–1.52)	1.34 (1.10–1.62)	
Absenteeism					
Children's age					
0–5 years old					Reference
Two-parent	1557	1.3%	Reference	Reference	
Single-parent	271	2.2%	1.66 (0.68–4.04)	1.28 (0.56–2.91)	
6–9 years old					0.71
Two-parent	1028	3.7%	Reference	Reference	
Single-parent	275	4.7%	1.33 (0.73–2.46)	1.20 (0.60–2.41)	
10–12 years old					0.94
Two-parent	1054	3.6%	Reference	Reference	
Single-parent	382	6.0%	1.66 (1.00–2.73)	1.51 (0.79–2.91)	
13–14 years old					0.23
Two-parent	377	2.9%	Reference	Reference	
Single-parent	213	9.4%	3.20 (1.57–6.50)	3.12 (1.44–6.78)	

Notes: PR = prevalence ratio; 95% CI = 95% confidence interval. ¹ Adjusted for respondents' age group, educational attainment, household income and whether they lived with a grandparent. ² Two-parent and 0–5 years were used as the reference to assess *p* values of the interaction between family type and children's age group.

References

- World Health Organization. WHO Coronavirus Disease (COVID-19) Dashboard. Available online: <https://covid19.who.int/> (accessed on 4 March 2021).
- Johanna, N.; Citrawijaya, H.; Wangge, G. Mass screening vs lockdown vs combination of both to control COVID-19: A systematic review. *J. Public Health Res.* **2020**, *9*, 2011. [CrossRef] [PubMed]
- UNESCO. COVID-19 Impact on Education. Available online: <https://en.unesco.org/covid19/educationresponse> (accessed on 4 March 2021).
- Cabinet Office. Prime Minister Abe's Press Conference on 29 February 2020. Available online: https://www.kantei.go.jp/jp/98_abe/statement/2020/0229kaiken.html (accessed on 21 March 2022).
- Liu, Y.; Morgenstern, C.; Kelly, J.; Lowe, R.; Jit, M. The impact of non-pharmaceutical interventions on SARS-CoV-2 transmission across 130 countries and territories. *BMC Med.* **2021**, *19*, 40. [CrossRef] [PubMed]
- Takaku, R.; Yokoyama, I. What the COVID-19 school closure left in its wake: Evidence from a regression discontinuity analysis in Japan. *J. Public Econ.* **2021**, *195*, 104364. [CrossRef] [PubMed]
- Ministry of Education Culture Sports Science and Technology. School and Community Activities after the Declaration of the Emergency State. 2020. Available online: https://www.mext.go.jp/content/20200409-mxt_kouhou01-000004520_1.pdf (accessed on 21 March 2022).
- Ministry of Education Culture Sports Science and Technology. The Guideline for School Closure Implementation in Response to the SARS-CoV2 Pandemic (Revision as of 7 April 2020). 2020. Available online: https://www.mext.go.jp/content/20200408-mxt_kouhou01-000006156_2.pdf (accessed on 21 March 2022).
- Hodges, C.; Moore, S.; Lockee, B.; Trust, T.; Bond, A. The Difference between Emergency Remote Teaching and Online Learning. EDUCASE Review. 2020. Available online: <https://er.educause.edu/articles/2020/3/the-difference-between-emergency-remote-teaching-and-online-learning> (accessed on 21 March 2022).

10. Ministry of Education Culture Sports Science and Technology. Educational Measures among Public Schools Related to School Closure for the SARS-CoV2 Pandemic. 2020. Available online: https://www.mext.go.jp/content/20200421-mxt_kouhou01-000006590_1.pdf (accessed on 21 March 2022).
11. Kato, T.; Takehara, K.; Suto, M.; Sampei, M.; Urayama, K.Y. Psychological distress and living conditions among Japanese single-mothers with preschool-age children: An analysis of 2016 Comprehensive Survey of Living Conditions. *J. Affect. Disord.* **2021**, *286*, 142–148. [[CrossRef](#)] [[PubMed](#)]
12. Kachi, Y.; Abe, A.; Ando, E.; Kawada, T. Socioeconomic disparities in psychological distress in a nationally representative sample of Japanese adolescents: A time trend study. *Aust. N. Z. J. Psychiatry* **2016**, *51*, 278–286. [[CrossRef](#)] [[PubMed](#)]
13. Bouye, K.; Truman, B.I.; Hutchins, S.; Richard, R.; Brown, C.; Guillory, J.A.; Rashid, J. Pandemic Influenza Preparedness and Response among Public-Housing Residents, Single-Parent Families, and Low-Income Populations. *Am. J. Public Health* **2009**, *99*, S287–S293. [[CrossRef](#)] [[PubMed](#)]
14. Tso, W.W.Y.; Wong, R.S.; Tung, K.T.S.; Rao, N.; Fu, K.W.; Yam, J.C.S.; Chua, G.T.; Chen, E.Y.H.; Lee, T.M.C.; Chan, S.K.W.; et al. Vulnerability and resilience in children during the COVID-19 pandemic. *Eur. Child Adolesc. Psychiatry* **2020**, *31*, 161–176. [[CrossRef](#)] [[PubMed](#)]
15. Miyawaki, A.; Tabuchi, T.; Tomata, Y.; Tsugawa, Y. Association between participation in the government subsidy programme for domestic travel and symptoms indicative of COVID-19 infection in Japan: Cross-sectional study. *BMJ Open* **2021**, *11*, e049069. [[CrossRef](#)] [[PubMed](#)]
16. Naimi, A.I.; Whitcomb, B.W. Estimating Risk Ratios and Risk Differences Using Regression. *Am. J. Epidemiol.* **2020**, *189*, 508–510. [[CrossRef](#)] [[PubMed](#)]
17. Chaabane, S.; Doraiswamy, S.; Chaabna, K.; Mamtani, R.; Cheema, S. The Impact of COVID-19 School Closure on Child and Adolescent Health: A Rapid Systematic Review. *Children* **2021**, *8*, 415. [[CrossRef](#)] [[PubMed](#)]
18. Meherali, S.; Punjani, N.; Louie-Poon, S.; Abdul Rahim, K.; Das, J.K.; Salam, R.A.; Lassi, Z.S. Mental Health of Children and Adolescents Amidst COVID-19 and Past Pandemics: A Rapid Systematic Review. *Int. J. Environ. Res. Public Health* **2021**, *18*, 3432. [[CrossRef](#)] [[PubMed](#)]
19. Di Giorgio, E.; Di Riso, D.; Mioni, G.; Cellini, N. The interplay between mothers' and children behavioral and psychological factors during COVID-19: An Italian study. *Eur. Child Adolesc. Psychiatry* **2020**, *30*, 1401–1412. [[CrossRef](#)] [[PubMed](#)]
20. Fegert, J.M.; Vitiello, B.; Plener, P.L.; 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* **2020**, *14*, 20. [[CrossRef](#)] [[PubMed](#)]
21. Awadalla, S.; Davies, E.B.; Glazebrook, C. A longitudinal cohort study to explore the relationship between depression, anxiety and academic performance among Emirati university students. *BMC Psychiatry* **2020**, *20*, 448. [[CrossRef](#)] [[PubMed](#)]
22. Velasco, A.A.; Cruz, I.S.S.; Billings, J.; Jimenez, M.; Rowe, S. What are the barriers, facilitators and interventions targeting help-seeking behaviours for common mental health problems in adolescents? A systematic review. *BMC Psychiatry* **2020**, *20*, 293. [[CrossRef](#)]
23. World Health Organization. Adolescent Mental Health. 2020. Available online: <https://www.who.int/news-room/fact-sheets/detail/adolescent-mental-health> (accessed on 4 March 2021).
24. Acosta, D.; Fujii, Y.; Joyce-Beaulieu, D.; Jacobs, K.D.; Maurelli, A.T.; Nelson, E.J.; McKune, S.L. Psychosocial Health of K-12 Students Engaged in Emergency Remote Education and In-Person Schooling: A Cross-Sectional Study. *Int. J. Environ. Res. Public Health* **2021**, *18*, 8564. [[CrossRef](#)] [[PubMed](#)]
25. Ministry of Education Culture Sports Science and Technology. SOS Contacts for Children. Available online: https://www.mext.go.jp/a_menu/shotou/seitoshidou/06112210.htm (accessed on 24 March 2022).
26. Childline Support Center Japan. ChildLine for Child in Japan. Available online: <https://childline.or.jp/en/> (accessed on 24 March 2022).
27. Sharma, M.; Aggarwal, S.; Madaan, P.; Saini, L.; Bhutani, M. Impact of COVID-19 pandemic on sleep in children and adolescents: A systematic review and meta-analysis. *Sleep Med.* **2021**, *84*, 259–267. [[CrossRef](#)] [[PubMed](#)]
28. Cerniglia, L.; Cimino, S.; Ammaniti, M. What are the effects of screen time on emotion regulation and academic achievements? A three-wave longitudinal study on children from 4 to 8 years of age. *J. Early Child. Res.* **2021**, *19*, 145–160. [[CrossRef](#)]
29. Cartanyà-Hueso, À.; Lidón-Moyano, C.; González-Marrón, A.; Martín-Sánchez, J.C.; Amigo, F.; Martínez-Sánchez, J.M. Association between Leisure Screen Time and Emotional and Behavioral Problems in Spanish Children. *J. Pediatr.* **2021**, *241*, 188–195.e3. [[CrossRef](#)] [[PubMed](#)]
30. Ministry of Health Labor and Welfare. Support Policies for Single Parent Households in 2017. Available online: <https://www.mhlw.go.jp/content/11920000/000363014.pdf> (accessed on 21 March 2022).