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Vulnerable preschoolers mental health during the Covid-19 pandemic in Argentina: A cross-sectional study

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ABSTRACT

Since the Covid-19 pandemic began, children have presented with increased psychiatric symptoms. Little research has been done regarding early childhood mental health, particularly those from vulnerable socioeconomic contexts who are exposed to adversity. We aimed to assess mental health and the impacts of the pandemic on this population. A survey and the Strength and Difficulties Questionnaire were administered to the caregivers of preschoolers who were enrolled in a food-assistance programme. The participants were 807 preschoolers from the City of Buenos Aires, Argentina, which was ranked among the cities with the longest lockdown. Around 39% of preschoolers were classified as having a 'possible/probable' psychiatric disorder. Externalizing problems were predominant. Most caregivers (82.78%) reported increased psychological symptoms during the lockdown, mostly externalizing problems. Caregivers' burdens were associated with the severity, duration, and exacerbation of their child's symptoms. Further research should continue to monitor preschoolers' well-being, with the goal of preventing future problems.

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The effects of the Covid-19 pandemic on children's mental health have been a trending topic in scientific research (Theberath et al., 2022). Considering that stressors, such as experiencing a pandemic in early childhood can increase vulnerability to future mental disorders (Albott, Forbes, & Anker, 2018; Arpawong et al., 2022), it is necessary to understand the pandemic's psychological consequences in order to intervene. School-age children and adolescents have shown increased depression and anxiety symptoms since the beginning of the pandemic (Cabana et al., 2021; Duan et al., 2020; Fong & Iarocci, 2020; Gorrotxategi Gorrotxategi et al., 2020; Loades et al., 2020; Magklara, Lazaratou, Barbouni, Poulas, & Farsalinos, 2020; Mondragon, Sancho, Santamaria, & Munitis, 2021; Morgül, Kallitsoglou, & Essau, 2020; Ravens-Sieberer et al., 2021; Russell, Hutchison, Tambling, Tomkunas, & Horton, 2020; Sarkadi, Sahlin Torp, Pérez-Aronsson, & Warner, 2021; Saurabh & Ranjan, 2020; Shorer & Leibovich, 2020; Srivastava, 2020; Tang, Xiang, Cheung, & Xiang, 2021). As a result of lockdown restrictions, children have also faced changes in their daily routines, such as increases in screen use, indoor time and sleep duration (Aguilar-Farias et al., 2021; Alonso-Martínez, Ramírez-Vélez, García-Alonso, Izquierdo, & García-Hermoso, 2021; Cellini, Di Giorgio, Mioni, & Di Riso, 2021; Delisle Nyström et al., 2020; Erades & Sabuco, 2020; MacKenzie et al., 2021; Magklara et al., 2020; Morgül et al., 2020; Yeasmin et al., 2020).

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Little research has been done to explore preschooolers' mental health during the Covid-19 pandemic. Precursor behaviours of mental disorders are usually identified by this age (Dougherty et al., 2015; Zeanah et al., 2016); thus, it can be beneficial to assess how preschoolers have been experiencing the pandemic. Moreover, particular attention is required for young children in vulnerable regions, since the pandemic has not had equal impacts among different socioeconomic contexts (High Level Panel of Experts on Food Security and Nutrition [HLPE], 2020). These preschoolers are exposed to a larger amount of adversity and the pandemic is an additional factor that could contribute to the development of mental disorders. Argentina is a Latin American country with a poverty rate of 37.3% (Instituto Nacional de Estadística y Censos [INDEC], 2022). Its pandemic lockdown has been one of the longest and strictest in the world, which has been associated with worse mental health outcomes (Brooks et al., 2020; Erades & Sabuco, 2020; Mondragon et al., 2021). Therefore, Argentina provides a unique scenario for studying vulnerable preschoolers' mental health.

Aiming to fill this research gap and better characterize this population, this study assessed the mental health status of vulnerable preschoolers in Argentina during the Covid-19 pandemic through a survey administered to their caregivers. To the best of our knowledge, this is the first study to analyse vulnerable preschoolers' mental health in such a unique pandemic context.

Mental health in the early years

An estimated 75% of mental disorders begin during childhood and adolescence (Jones, 2013; Kessler et al., 2005; Kessler et al., 2007; Kim-Cohen et al., 2003). Mental disorders are usually preceded by non-specific behavioural and emotional symptoms in early childhood (Caspi, Moffitt, Newman, & Silva, 1996; Colizzi, Lasalvia, & Ruggeri, 2020; Hofstra, Van Der Ende, & Verhulst, 2002; Mesman & Koot, 2001), which are increasingly identified in preschool aged children (Dougherty et al., 2015; Zeanah et al., 2016).

Although preschoolers' behaviour is quite heterogeneous, it is possible to identify behavioural patterns that are likely to lead to a future psychological disorder (Mesman & Koot, 2001; Wakschlag et al., 2019). Preschoolers usually present with externalizing problems rather than internalizing (Arslan, Lucassen, Van Lier, De Haan, & Prinzie, 2021; Gilliom & Shaw, 2004; Isdahl-Troye, Villar, Domínguez-Álvarez, Romero, & Deater-Deckard, 2022). Externalizing problems are defined as generating discomfort in the environment, as they are outer-directed (Forns, Abad, Kirchner, & Levesque, 2011). These problems gradually decrease with age while internalizing problems tend to increase (Arslan et al., 2021; Atherton, Ferrer, & Robins, 2018; Gilliom & Shaw, 2004; Isdahl-Troye et al., 2022). This is thought to be related to neurocognitive development and interaction with the social environment –namely, the social consequences of externalizing symptoms lead to internalizing problems (Willner, Gatzke-Kopp, & Bray, 2016). Therefore, higher rates of externalizing problems are associated with a higher risk of presenting internalizing problems in adolescence and beyond (Caspi et al., 1996; Gilliom & Shaw, 2004; Hofstra et al., 2002; Mesman & Koot, 2001; Willner et al., 2016). The same pattern has been shown in children from vulnerable contexts, such as low-income families (Kochanova, Pittman, & McNeela, 2022; Willner et al., 2016), although externalizing problems may persist for longer (Comeau & Boyle, 2018).

Vulnerability to future mental disorders is increased by childhood adversity (Albott et al., 2018; Arpawong et al., 2022). The effects of stressful events persist throughout the lifespan evinced by epigenetic alterations (Bunea, Szentágotai-Tătar, & Miu, 2017; Jorm & Mulder, 2018). Preschoolers, in particular, are generally exposed to higher rates of adversities than older children, which is also associated with experiencing internalizing and externalizing problems (Loomis, 2018). This calls for primary prevention to mitigate adverse childhood trauma, or when this is not possible, secondary prevention to limit the effects of past adverse experiences on mental health. Early childhood interventions have been shown to prevent mental disorders later in life (Mendelson & Eaton, 2018; Wakschlag et al., 2019).

The impact of Covid-19 on mental health

Experiencing a pandemic is a social adversity that impacts children's mental health in several ways. Studies from previous pandemics have suggested that quarantined children were five times likelier to require mental health services than children who had not been quarantined (Loades et al., 2020). As expected, many studies from around the world have shown an increase in psychopathological symptoms in children arising from the Covid-19 pandemic and the actions taken to mitigate its effects, such as quarantine (Alzaga, Roncero, & Domínguez-Rodríguez, 2020; Brooks et al., 2020; Magklara et al., 2020; Yeasmin et al., 2020). Children are among the most susceptible populations to be psychologically affected because of their limited understanding of the pandemic. This makes them more likely to be concerned, in addition to the uncertainty of the situation and the imposition of lockdowns (Cabana et al., 2021; Mondragon et al., 2021; Saurabh & Ranjan, 2020; Srivastava, 2020). However, early childhood mental health has not been much explored, as most studies focus on older children. Children in early childhood, such as preschoolers, have specific phase needs that have been affected by pandemic restrictions (Marzilli et al., 2021). Furthermore, the well-being of vulnerable preschoolers – for example, those from households of low socioeconomic status – has been greatly jeopardized during the Covid-19 pandemic (Cohen & Bosk, 2020), as their caregivers may have lost their jobs or had to rely on few resources to cope with the restrictions (Wu & Xu, 2020).

Previous research has found that school-age children and adolescents have reported depressive and anxiety symptoms since the beginning of the pandemic, and that quarantine has been one of the major challenges they had to face. Saurabh and Ranjan (2020) compared a group of children in India who underwent quarantine (n = 121) with a control group of children who were not quarantined (n = 131). Distress was greater in the first group, and fear, nervousness, and annoyance were significantly more predominant. Regarding depressive symptoms, Duan et al. (2020) administered an online questionnaire to children aged 7–18 years (n = 3.613) in China and observed that nearly a quarter experienced depressive symptoms. Fear, nervousness, worry, loneliness, sadness, boredom, anger and feelings of being overwhelmed were frequently reported (Cabana et al., 2021; Gorrotxategi Gorrotxategi et al., 2020; Mondragon et al., 2021; Morgül et al., 2020; Sarkadi et al., 2021; Shorer & Leibovich, 2020). Social isolation was also one of the most significant difficulties children experienced during lockdown (Fong & Iarocci, 2020), as they often reported missing their peers, caregivers, teachers, and relatives (Cabana et al., 2021; Magklara et al., 2020; Mondragon et al., 2021). However, one study did not find elevated depressive symptoms (Ravens-Sieberer et al., 2021). The authors attributed this to the fact that lockdown measures were softened at the time the study was conducted, as morbidity and mortality from Covid-19 decreased. As a result, mental health status may vary by context, according to each location's pandemic-specific problems.

Furthermore, many studies have shown increased anxiety (Duan et al., 2020; Loades et al., 2020; Ravens-Sieberer et al., 2021; Russell et al., 2020; Srivastava, 2020; Tang et al., 2021). Ravens-Sieberer et al. (2021) administered a representative online survey among children between 7 and 17 years old and compared the results with the data from the BELLA cohort study conducted in Germany before the pandemic. They found children had higher anxiety levels (24.1%) than they did before the pandemic started (14.9%). Factors associated with increased anxiety were being female, having a relative or friend infected with coronavirus, presenting an emotional-focused coping style, exhibiting clinical depressive symptoms, and being a resident in urban areas (Duan et al., 2020). Living in a city has been associated with a higher risk of suffering any mental health-related problem (Duan et al., 2020; Ravens-Sieberer et al., 2021; Yeasmin et al., 2020); while children in rural areas experienced an attenuated impact of the pandemic (Aguilar-Farias et al., 2021). One possible explanation for this phenomenon is that stronger political measures to limit the coronavirus spread were taken in urban areas than in rural regions, leading to longer periods experiencing lockdown and isolation (Duan et al., 2020; Yeasmin et al., 2020).

It is important to point out that regardless of mental health conditions, children also count on resilience to cope with adversity. Many children reported being generally satisfied, feeling their lives had remained the same or were better since the pandemic, and showing signs of optimism

regardless of coexisting psychological symptoms (Gorrotxategi Gorrotxategi et al., 2020; Tang et al., 2021; Vallejo-Slocker, Fresneda, & Vallejo, 2020). Additionally, youth with greater self-efficacy had reduced mental health symptoms (Hussong, Midgette, Thomas, Coffman, & Cho, 2021).

Other difficulties children presented with were related physical health and sleep. Many studies have evidenced a decrease in time spent doing physical activity and an increases in screen time and sleep duration (Aguilar-Farias et al., 2021; Alonso-Martínez et al., 2021; Cellini et al., 2021; Delisle Nyström et al., 2020; Erades & Sabuco, 2020; MacKenzie et al., 2021; Magklara et al., 2020; Morgül et al., 2020; Yeasmin et al., 2020). These changes arose from the need to adapt their routines to lockdown restrictions. For parents of infants, this has been a major challenge. Children too young to attend school, such as toddlers and preschoolers, may demand more care and attention and require greater responsibility. Research has shown that, in general, parents reported feeling stressed, which also had an impact on their relationship with their children (Ravens-Sieberer et al., 2021; Russell et al., 2020; Tang et al., 2021). Marzilli et al. (2021) suggested that parents with histories of trauma and their children were at a higher risk of distress. When these factors were combined with a vulnerable socioeconomic context, they led to more difficulties in adapting routines (Wu & Xu, 2020).

Less research has been performed in vulnerable contexts. One study in a vulnerable context in Spain administered the Strength and Difficulties Questionnaire (SDQ) to children over 8 years of age (n = 459) from at-risk families. The results were compared with the Spanish National Health Survey from 2017 and suggested that children have worse psychological well-being than before the Covid-19 outbreak, as only 60% obtained a normal score versus 87.4% in 2017. They also scored significantly higher in all subscales and exhibited higher externalizing problems than in the past (Vallejo-Slocker et al., 2020). Another study in a socioeconomically vulnerable context took place in Chicago, in the United States. The authors administered a survey to low-income families with preschoolers to assess changes in family dynamics. The results showed that the combination of job loss and income decrease was associated with stress and depressive symptoms in the parents and negative parent child interactions (Kalil, Mayer, & Shah, 2020). Although this study addressed the vulnerable preschooler population, the participants did not belong to a vulnerable population before the pandemic and they focused on parents' mental health rather than on preschoolers'. As a result, the psychological status of vulnerable young children remains unclear.

Taken together, these results suggest a pattern of increased internalizing symptoms in school-age children and adolescents after the coronavirus pandemic began (Cabana et al., 2021; Duan et al., 2020; Gorrotxategi Gorrotxategi et al., 2020; Loades et al., 2020; Mondragon et al., 2021; Morgül et al., 2020; Ravens-Sieberer et al., 2021; Russell et al., 2020; Sarkadi et al., 2021; Shorer & Leibovich, 2020; Tang et al., 2021), although not all studies support it (Becerra, Contreras, Romero, López, & Torres, 2020). However, it remains unknown whether this pattern also extends to the preschooler population. This might not be the case considering that the Covid-19 pandemic and lockdown appeared to affect mental health differently across different populations according to their unique characteristics, such as age, socioeconomic status, responsibilities, understanding of the pandemic, and changes in routine.

Finally, one important variable to take into account is the lockdown duration. The presence of psychological difficulties increases as the lockdown time extends (Brooks et al., 2020; Erades & Sabuco, 2020; Mondragon et al., 2021). A longitudinal study carried out from the third to sixth week of the lockdown in Spain (n = 972) revealed that the symptoms prevalence increased over time, measured with the SDQ questionnaire (Becerra et al., 2020). This suggests children's and adolescents' mental health worsens as the lockdown lengthens. Therefore, it is expected that children present worse psychological statuses in regions where quarantine is longer or more intense.

The context of this study

Currently, Argentina has had one of the longest and strictest lockdowns in the world. So far, the Autonomous City of Buenos Aires, Argentina, has had the longest non-stop quarantine globally,

lasting 234 days in a row and 244 days of cumulative lockdown (Boaz, 2021; Ritchie et al., 2020). Argentina is a Latin American country with a poverty rate of around 37.3% (INDEC, 2022). It is well established that the pandemic had a significant socioeconomic impact on low-income households, resulting in income loss and food insecurity, among other issues (HLPE, 2020). In response, the Argentine government has provided food-assistance programmes for families in vulnerable socioeconomic contexts.

Studies in this region have focused on children over six years of age and adolescents (Cabana et al., 2021) or adults (Torrente et al., 2021). Worldwide, few studies were conducted during the Covid-19 pandemic exploring the mental health status of younger children, aged two to five years, and even fewer on preschoolers from vulnerable contexts. Despite 90% of children living in low and middle-income countries, only 10% of mental health research comes from these countries (Kieling et al., 2011). Addressing this question is important, since vulnerable preschoolers are already exposed to more adversity than children in other contexts; and these life event stressors combined with the pandemic can increase their vulnerability to future mental disorders in this specific early developmental phase (Walker & Diforio, 1997).

In this way, Argentina provides a unique scenario in which to study how vulnerable preschoolers are undergoing the quarantine and pandemic. This study aims to assess mental health and the impacts of the Covid-19 pandemic on vulnerable preschoolers from the Autonomous City of Buenos Aires. We hypothesize that preschoolers will show an age-specific difficulty pattern, characterized by externalizing symptoms, rather than internalizing symptoms as older children do. Accordingly, we hypothesize preschoolers will present increased symptoms during quarantine, and we expect the rate of symptoms to be associated with levels of parenting distress and the time of presence of these difficulties. Finally, we anticipate changes in sleep patterns, as has been shown in older children.

Materials and methods

Sample

Participants were 807 preschoolers aged 2–5 years coming from a vulnerable population. They attended public kindergarten schools in the Autonomous City of Buenos Aires, and their families were part of a food-assistance programme. They were selected by spontaneous demand. Table 1 presents their sociodemographic characteristics. Of a total of 1040 preschoolers, 233 were excluded due to not meeting the inclusion criteria: 169 did not accept the informed consent, and 64 did not meet the age criteria ($\leq$ 5 years old). All caregivers gave their written informed consent for inclusion before they participated in the study.

Instruments

Sociodemographic information was collected by questions regarding age, number of children per family, disposition of outdoor space in the home, cohabitants, and caregiver educational level. Another question explored the sleep pattern of the preschoolers to assess any possible change.

One parent-report questionnaire was used. The Spanish (Río de la Plata) Strengths and Difficulties Questionnaire (SDQ-cas) is a psychopathology screening that measures positive and negative behavioural and psychological attributes (Goodman, 2005). It consists of 25 items divided into five subscales: 1. Peer problems, 2. Behaviour problems, 3. Emotional symptoms, 4. Hyperactivity and 5. Prosocial behaviour and a total difficulties score. In this study, the Prosocial behaviour subscale was excluded given it does not contribute to the total score and there was limited time to administer the instrument. An adjustment was made in the phrasing of one item due to cultural pejorative aspects of the term (e.g. '*steals*' was replaced by '*gets angry*'). The total score predicts the likelihood of presenting any psychiatric disorder by classifying them as 'unlikely', 'possible' or 'probable'. We

Table 1. Sociodemographic characteristics of children and their families.

	Full sample	
	n	%
Age		
Two	74	9.17
Three	215	26.64
Four	267	33.09
Five	251	31.1
Outdoor Space		
Balcony	235	29.12
Garden	25	3.10
Yard	227	28.13
Terrace	135	16.73
Nothing	185	22.92
Parents Educational Level		
Incomplete Primary School	20	2.48
Complete Primary School	70	8.67
Incomplete High School	121	14.99
Complete High School	295	36.56
Incomplete Tertiary Education	45	5.58
Complete Tertiary Education	102	12.64
Incomplete Undergraduate Education	55	6.82
Complete Undergraduate Education	99	12.27

Note. $N = 807$. Participants were on average 3.86 years old (SD = 0.96), children per family were on average 2 (SD = 1.18) and cohabiting was on average 7.73 people per house (SD = 4.31).

combined the last two categories into 'possible/probable' as done in previous research (Abbasalizad Farhangi, Dehghan, & Jahangiry, 2018). Each subscale gives information about specific probable diagnoses: conduct disorders, emotional disorders, and hyperactivity disorders (Goodman, Ford, Simmons, Gatward, & Meltzer, 2000). It also provides information about the problem types: internalizing (emotional plus peer problems) or externalizing (hyperactivity plus behaviour problems) (Goodman, Lamping, & Ploubidis, 2010). The SDQ has demonstrated good reliability (Cronbach's alpha between .59 and .88) and good levels of construct, concurrent and discriminant validity (García et al., 2000; García Cortázar, Mazaira, & Godman, 2000; Saur & Loureiro, 2012). For this sample, the Cronbach's alpha for the total scale was .69.

Furthermore, after each item of the SDQ, another question was added to explore how that characteristic varied during quarantine. The question asked was '*If you selected 'Somewhat True' or 'Certainly True': Do you think this characteristic was increased during the quarantine? In case you had selected 'Not true' choose 'Does not apply''*. The reply consisted of a 3 options reply between '*Yes*', '*No*' and '*Does not apply*'. Lastly, two questions from the impact supplement were included about how these symptoms impact the caregiver/family and how long they have been present.

Procedure

A descriptive cross-sectional study was conducted, consisting of a survey and a self-report questionnaire. The instruments were administered to their caregivers by social assistants from the city government, who were trained by a clinical child-adolescent psychologist and psychiatrist. The data collection took place in August and September of 2020 in the Autonomous City of Buenos Aires, Argentina, while the city was still in strict quarantine, which had started in March. Therefore, the study was carried out after approximately six months of strict lockdown and while it was still ongoing. Currently, the Autonomous City of Buenos Aires had the longest non-stop strict lockdown of all cities in the world, lasting 234 days in a row. In this way, the study was held in an area highly impacted by the quarantine. The study was conducted in accordance with the Declaration of Helsinki, and the protocol was approved by the Autonomous City of Buenos Aires' Government (our study was requested by the authorities of the Autonomous City of Buenos Aires' Government).

Data analysis

The software R (version 4.0.3) was used for statistical analysis. There was no missing data. Descriptive analysis was conducted to calculate the mean and standard deviation of the SDQ total scale and subscale; and the relative frequency for the SDQ categories ('possible/probable' and 'unlikely') and increment of SDQ-measured symptoms during quarantine. To measure the number of negative characteristics that increased during the lockdown, we excluded those items in which an increment would mean a positive quality, such as '*Think things out before acting*' or '*Generally well behaved, usually does what adults request*'. For the inferential analysis, normal distribution was assessed with the Shapiro test. On consideration that the sample did not follow a normal distribution, non-parametric tests were used. To measure the correlation between variables, Spearman's rank correlation coefficient was implemented. Chi-squared test was utilized to compare the frequencies of 'possible/probable' disorder cases in the SDQ-cas with 'possible/probable' in subscales, and the size effect was analyzed with Cramer's V.

Results

SDQ analysis and type of predominant problems

The SDQ-cas results are presented in Table 2. The mean scores range within the normal values. The total score, peer and behavioural problems scores are located in the upper normal limit. The comparison between internalizing and externalizing patterns shows that sample problems are predominantly of the externalizing type. While 76% ($n = 611$) obtained a higher score in the externalizing than in the internalizing scale, the opposite is true only for 16% ($n = 128$). The remaining 8% ($n = 68$) presents a non-defined pattern, where the scores in both scales are equal.

The SDQ-cas total score analysis shows 20% ($n = 162$) fall into the 'probable' disorder category, and 19% ($n = 154$) into 'possible' disorder, while the rest 61% ($n = 491$) have a normal score ('unlikely' disorder). In this way, 39% ($n = 316$) of the children are classified as having a 'possible/probable' disorder. About the subscales, 51% ($n = 410$) present Peer Problems, 50% ($n = 404$) exhibit Behaviour Problems, 37% ($n = 282$) Hyperactivity and only 19% ($n = 158$) show Emotional Problems (Table 3).

Between the 39% of children with any 'possible/probable' disorder, 34% ($n = 272$) for the Behaviour problems, 28% ($n = 228$) for the Peer problems, 27% ($n = 216$) for the Hyperactivity subscale, and 16% ($n = 129$) also classify as 'possible/probable' emotional problems (Table 4). A Chi-square test of independence for each of the subscales revealed significant associations between SDQ-cas total score classification (any 'possible/probable' or 'unlikely' disorder) and the compliance with criteria for the subscales specific 'possible/probable' disorders (EP: X^2 (1) = 146.66, p >.01, V = 0.43; H: X^2 (1) = 210.03, p >.01, V = 0.51; BP: X^2 (1) = 267.09, p >.01, V = 0.58; PP: X^2 (1) = 93.291, p >.01, V = 0.34). Namely, participants who are classified as having a 'possible/probable' disorder show specific types of problems (based on the subscales), rather than a diffuse profile of symptoms with no compliance in the subscales.

Table 2. Mean and standard deviation of the SDQ-cas total and subscale scores.

SDQ-cas	
EP	2.05 (1.82)
H	4.83 (2.17)
BP	2.86 (2.07)
PP	2.59 (1.77)
I	4.64 (2.82)
E	7.69 (3.54)
Total	12.33 (5.24)

Note. Standard deviations are presented in parenthesis. E*P* = emotional problems; H = hyperactivity; B*P* = behaviour problems; P*P* = peer problems; I = internalizing score; E = externalizing score.

Table 3. Absolute and percentage frequencies of SDQ-cas subscale scores of the sample.

	Unlikely		Possible		Probable	
	n	%	n	%	n	%
EP	649	80	76	9	82	11
HP	505	63	133	16	169	21
BP	403	50	139	17	265	33
PP	397	49	183	23	227	28

Note. E*P* = emotional problems; H = hyperactivity; B*P* = behavior problems; P*P* = peer problems.

Increment of SDQ-measured symptoms during quarantine

At least one negative behaviour or characteristic measured by the SDQ-cas has increased during the lockdown as 82.78% ($n = 668$) reported. Of those, 96.1% (n = 542) experienced an increment in less than 10 characteristics during quarantine, while the rest 3.9% ($n = 26$) faced an increment in more than 10 negative aspects. Even though all types of subscale problems (Emotional, Hyperactivity, Behaviour, Peer problems) have increased slightly in the same amount, the externalizing symptoms (M = 9.08, SD = 3.23) seem to be more predominant than internalizing symptoms (M = 5.80, SD = 2.83) during the lockdown. The increase in the externalizing problems was bigger than in the internalizing problems for 49% ($n = 394$) of the children, while 21% ($n = 171$) reported a higher increase in the internalizing problems. About 30% ($n = 242$) faced an equal increase in both types of problems.

An increase in SDQ-measured symptoms is associated with burden level and period of presence

The number of negative characteristics increased during lockdown correlated positively with the SDQ-cas total score ($r = .62$, $p < .01$). Both variables were also associated with the period of time the symptoms have been present ($r = .31$, $p < .01$, $r = .37$, $p < .01$ respectively) as well as with the burden level they generate ($r = .31$, $p < .01$, $r = .36$, $p < .01$ respectively). This means the higher the SDQ-cas total score or undesired characteristics increased during quarantine, the greater the burden they generate on the caregiver/family and the longer they have been present. At last, the time of presence of the symptoms and the level of burden are strongly correlated, meaning that when they are present for a longer time, they generate a higher load ($r = .77$, $p < .01$).

The score of all SDQ-cas subscales correlated with the number of undesired characteristics increased in quarantine measured by each subscale (Table 5), meaning that those who obtained a higher SDQ-cas subscale score presented a higher increase in the amount of those negative characteristics during quarantine.

Changes in sleep pattern

Regarding sleep patterns, more than half of the preschoolers presented changes in their sleep patterns (59.73%, n = 482). Most of them slept and got up later than usual (n = 276), others also

Table 4. Frequencies and Chi-Square Results for SDQ-cas subscales by total score.

SDQ	*P/P* total score				Unlikely total score				
	P/P in subscale		Unlikely in subscale		*P/P* in subscale		Unlikely in subscale		
	n	%	n	%	n	%	n	%	χ^2
EP	129	16	187	23	29	4	462	57	146.66*
H	216	27	100	12	86	11	405	50	210.03*
BP	272	34	44	5	132	16	359	44	267.09*
PP	228	28	88	11	182	23	309	38	93.291*

Note. *P/P* = Possible/Probable; E*P* = emotional problems; H = hyperactivity; B*P* = behavior problems; P*P* = peer problems. * $p < .01$.

presented a later bedtime schedule but woke up earlier than usual (n = 89) and the rest woke up several times during the night (n = 64) or went to their caregiver's bed (n = 53).

Discussion

This study, one of the first to assess mental health in vulnerable preschoolers during the Covid-19 pandemic, found that many preschoolers from low-income households experienced increased psychological symptoms during the lockdown, primarily of the externalizing type. Furthermore, this increase was associated with higher levels of burden on caregivers. The theoretical and practical implications of these findings are discussed below.

Vulnerable preschoolers' mental health: externalising symptoms

This research found that 39% of the preschoolers in this study were classified as having possible or probable psychiatric diagnoses. Based on their SDQ-cas subscale scores, roughly half of the sample were classified into the 'possible/probable' category for Peers Problems and Behavioural Problems, and 37% fell into this category for Hyperactivity. In general, externalizing problems were more prevalent than internalizing problems. These findings are consistent with theoretical developments about young children often presenting with externalizing problems that gradually decrease during development, whereas internalizing problems become more common with increasing age (Arslan et al., 2021; Atherton et al., 2018; Ghandour et al., 2018; Gilliom & Shaw, 2004; Isdahl-Troye et al., 2022).

Moreover, this study found that vulnerable preschoolers' psychological symptoms increased during the lockdown, as most caregivers reported an increase in at least one negative behaviour or characteristic since quarantine started. The increase in externalizing problems was greater than the increase in internalizing symptoms. This suggests that the difficulties preschoolers faced during quarantine differ from those of older children, as increased internalizing symptoms have been reported in the latter population (Cabana et al., 2021; Duan et al., 2020; Fong & Iarocci, 2020; Gorrotxategi Gorrotxategi et al., 2020; Loades et al., 2020; Magklara et al., 2020; Mondragon et al., 2021; Morgül et al., 2020; Ravens-Sieberer et al., 2021; Russell et al., 2020; Sarkadi et al., 2021; Saurabh & Ranjan, 2020; Shorer & Leibovich, 2020; Srivastava, 2020; Tang et al., 2021). Therefore, preschoolers seem to present an age-specific difficulty pattern characterized by externalizing symptoms that have been exacerbated by lockdown.

In addition, preschoolers presented changes in sleep patterns, mainly increased sleep duration. These changes usually imply decreased sleep efficiency (Aguilar-Farias et al., 2021; Erades & Sabuco, 2020), which can affect behaviour, making young children more irritable (Cellini et al., 2021) and potentially perpetuating externalizing problems. Hence, future interventions in this population could benefit from the inclusion of a sleep hygiene module.

Although Argentina is a unique context for studying the mental health of vulnerable populations during the Covid-19 pandemic due to the long duration of its quarantine and the country's high rates of poverty, the findings of increased psychological symptoms are consistent with other studies during the Covid-19 over non-vulnerable preschoolers, which found increased arousal, irritability and sleep disturbances (Alonso-Martínez et al., 2021; Kairupan, Rokot, Lestari, Rampengan, &

Table 5. Spearman correlations between the SDQ-cas subscales' scores and the characteristics increased in quarantine for each scale.

SDQ-cas subscales'	Characteristics increased in quarantine for each scale
1. Emotional symptoms	.73**
2. Hyperactivity	.46**
3. Behaviour problems	.63**
4. Peer problems	.40**

Note. ** $p < .01$.

Kairupan, 2021; Vasileva, Alisic, & De Young, 2021). The fact that preschoolers in our study came from low-income households and were part of a food assistance programme is not negligible given that food insecurity has been associated with an increased risk of mental disorders (Fang, Thomsen, & Nayga, 2021; &Ling, Duren, & Robbins, 2022). This makes them a target population for psychosocial interventions.

Preschoolers' difficulties: implications for their caregivers' mental health

The results indicate that higher levels of burden on caregivers were positively correlated with longer-lasting, more severe and more numerous difficulties for preschoolers during the lockdown. Previous research has made similar findings regarding caregivers' distress being higher (Fong & Iarocci, 2020; Ravens-Sieberer et al., 2021; Russell et al., 2020). Parenting preschoolers and adapting their routines has been a major challenge for vulnerable families with low incomes, who generally present with increased family distress (Wu & Xu, 2020) and fewer resources. These caregivers face difficulties in satisfying specific developmental needs (Marzilli et al., 2021). For example, caregivers had to adapt preschoolers' routines by decreasing the time spent outside, which led to a decrease in physical activity and an increase in sedentary time and screen use (Aguilar-Farias et al., 2021; Alonso-Martínez et al., 2021; Delisle Nyström et al., 2020). This is also related to the types of problems the preschoolers in the study presented, as externalizing problems frequently produce higher levels of distress in the environment, given that they are directly observable (Brown & Prinstein, 2011) and easily detected. Moreover, it is important to account that children's symptoms might be over-reported in caregivers with higher distress, considering that caregivers' distress may affect their perception of their children's problems (Ravens-Sieberer et al., 2021).

Conclusions, limitations, and implications

Our study has certain limitations. We used a non-probability sampling method focused only on vulnerable children who attended public kindergarten schools in the Autonomous City of Buenos Aires. Therefore, the results might not apply to children from other vulnerable contexts, such as rural regions, as symptom intensity can vary according to location, given that different governmental measures were needed to control the spread of Covid-19 in different areas (Duan et al., 2020; Yeasmin et al., 2020). We did not have baseline data from before the pandemic to compare with the results, therefore, we relied on caregivers' reports. Given that the study was merely descriptive, it was not possible to identify any causal relationship. Nonetheless, many studies about mental health during the Covid-19 pandemic have used the same methodology and thus faced the same limitation (Duan et al., 2020; Erades & Sabuco, 2020; Hussong et al., 2021; Mondragon et al., 2021; Magklara et al., 2020; Marzilli et al., 2021; Morgül et al., 2020; Russell et al., 2020; Tang et al., 2021; Theberath et al., 2022; Yeasmin et al., 2020), moreover, our sample contained a large number of participants, improving bias control and representativeness. Furthermore, we did not inquire whether any preschoolers were infected or had previously been infected with Covid-19. Even though having an active coronavirus infection is associated with higher distress, a systematic review found that the long-term mental health of adults who had been infected with Covid-19 did not differ from that of the general population (Bourmistrova, Solomon, Braude, Strawbridge, & Carter, 2022). Finally, we did not ask about pre-existing mental disorders, and it has been shown that children with pre-existing mental disorders seemed to have higher symptom rates than those without pre-existing pre-pandemic conditions (Srivastava, 2020). Despite these limitations, the study's relevance lies in the population studied, vulnerable preschoolers, and its contexts, one of the strictest quarantine zones in the world.

Our findings could potentially guide health policies oriented towards the maintenance of vulnerable children's population mental health. First, the participants in our sample were part of a food programme for low-income families that began during the pandemic. More integral interventions

should be implemented. For example, since externalizing symptoms underwent the largest increase, social programmes could focus on psychoeducation of behaviour and hyperactivity symptoms for caregivers, as well as teaching children cognitive–behavioural therapy techniques for self-regulation, stress relief, and anger management. In addition, social policies could offer basic and concrete explanations about the Covid-19 pandemic, adapted to preschoolers' cognitive level, as having accurate knowledge acts as a protective factor for mental health (Theberath et al., 2022). These interventions should be community-based programmes given that low-income populations have a hindered access to telehealth services. Early childhood interventions that target and minimize psychological and social risk factors related to the pandemic are essential to reducing the possibility of developing a mental disorder, especially in those who already have a biological predisposition.

In conclusion, our study brings to light findings about mental health in one of the least explored populations to date, in one of the most quarantine-intensive areas in the world. Our results suggest an increased incidence of symptomatology of psychological problems – primarily externalizing problems – in vulnerable preschoolers. More research that aims to monitor vulnerable children's mental health and prevent further problems is needed. Such studies can improve our understanding of how the Covid-19 pandemic and measures taken by governments have impacted vulnerable preschoolers and their caregivers' well-being.

Disclosure statement

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Data availability statement

The data that support the findings of this study are available from the corresponding author, Agustina Aragón-Daud, upon reasonable request.

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