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The impact of the COVID-19 lockdown on child and adolescent active play in Argentina
El impacto del aislamiento del COVID-19 en el juego activo de niños y adolescentes en la Argentina

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Abstract. Child and adolescent overweight and obesity are a multifactorial pandemic social problem; however, there is consensus on its link with a higher caloric intake than expenditure. In this context, it is relevant to analyze the propensity to insufficient physical activity in childhood, and in particular the effects of COVID-19 lockdown on active play.
A comparative analysis of the deficit of active play at a prepandemic time and in the period of exit from the strictest isolation in Argentina (2018; 2020) was conducted with 5479 and 3964 observations, respectively, of children between five and 17 years old. The measurements correspond to the Argentine Social Debt Survey (EDSA for its acronym in Spanish) on a national probability sample. First, a descriptive statistical analysis was performed, followed by a multivariate analysis based on logistic regressions. Active play decreased more among females than males as age and socioeconomic status rose. This decline was prominent among those with less physically active parents, a preference for sedentary screen time, and a lower inclination for structured physical activities. Lockdown measures, particularly in working-class neighbourhoods, appeared to shield children's active play. The pandemic and its restrictions harmed children's well-being through diminished play opportunities, affecting their physical, motor, psychological, and social health. Play is widely recognized as a vital bridge between physical activity and energy expenditure. It notably addresses the rising concern of childhood overweight and obesity. Thus, active play becomes a crucial behavior to promote in all circumstances, aligned with a comprehensive health perspective.
Keywords: active play, childhood and adolescence, integral health, obesity, COVID-19

Resumen. El sobrepeso y la obesidad infantojuvenil son un problema social pandémico multifactorial, aunque existe un consenso de su vinculación con una ingesta multifactorial, aunque existe un consenso de su vinculación con una ingesta calórica mayor al gasto. En este marco, es relevante analizar la propensión a la insuficiente actividad física en la infancia, y en particular los efectos del COVID-19 en el juego activo, especialmente el no escolar. Se realizó un análisis comparado del déficit de juego activo en un momento prepandemia **y** en la salida del aislamiento más estricto en la Argentina, en 2018 y 2020, con 5479 y 3964 observaciones respectivamente, en niños entre cinco y 17 años. Las mediciones corresponden a la Encuesta de la Deuda Social (EDSA) en una muestra probabilística nacional. Se realizó un análisis estadístico descriptivo y luego un análisis multivariado a partir de regresiones logísticas. La actividad física disminuyó más en las niñas que en los niños a medida que aumentaba la edad y el nivel socioeconómico. Esta disminución fue más notable en aquellos con padres menos activos físicamente, una preferencia por el tiempo frente a pantallas sedentarias y una menor inclinación hacia actividades físicas estructuradas. Las medidas de confinamiento, particularmente en barrios de clase trabajadora, parecieron proteger la actividad física en los niños. La pandemia y sus restricciones afectaron el bienestar de los niños al reducir las oportunidades de juego, lo que impactó en su salud física, motora, psicológica y social. El juego es ampliamente reconocido como un puente vital entre la actividad física y el gasto de energía, abordando de manera destacada la creciente preocupación por el sobrepeso y la obesidad infantil. Por lo tanto, la actividad física en el juego se convierte en un comportamiento crucial para promover en todas las circunstancias, en línea con una perspectiva integral de la salud.
Palabras clave: juego activo, niñez y adolescencia, salud integral, obesidad, COVID-19.

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Introduction

In Latin America and the Caribbean, malnutrition by excess is a social problem with a biological impact that affects a large part of the population of children and adolescents (Corvalán et al., 2017). In the last 30 years this type of malnutrition has increased from 6.2% to 7.5% in children under five years of age, which represents an increase of 400,000 individuals (FAO/IFAD/PAHO/WFP/UNICEF, 2021) The same report describes that its prevalence rose at a higher rate during the period of social isolation due to the COVID 19 pandemic, a situation probably associated with less access to healthy foods and a reduction in physical activity. At the onset of this pandemic, more than 2.6 billion people were confined to their homes and an estimated 25% were already obese. By the end of the first year of the pandemic (December 2020), 1.27 million new cases of childhood obesity were generated in the USA (Bueno et al., 2021). Although the genesis of obesity is complex and multifactorial (e.g., biological, psychological and socioeconomic factors), in an oversimplified way it is the consequence of a caloric intake greater than the energy expenditure generated, mainly during physical activity (FAO/WHO/UNU, 2001). In this context, "physical activity" is understood as any type of movement that requires energy expenditure, which includes those performed during the practice of exercise, active transportation, household chores and recreational activities (Unicef,2021). The World Health Organization recommends that children and adolescents perform at least one hour of moderate to vigorous physical activity daily (WHO, 2020). Nevertheless, talking about moderate or vigorous physical activity does not only refer to the practice of a sport or training in a fitness center.

In the pediatric age, different games require significant energy expenditure that can have a positive impact on health and fitness (Bendiksen et al., 2014). In this regard,

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some studies showed what has happened. In Italy, in an observational and longitudinal study, it was observed that during isolation the time devoted by the pediatric population to sports activities decreased by 2.5 hours per week and screen time increased by 4.85 hours on average per day (Pietrobelli, 2020).

A Canadian study examined the perspectives of parents and children under 12 years old on the impact of the COVID-19 epidemic on physical activity (play/sport) as well as barriers/facilitators to staying active during isolation. Although children missed their friends, parents/guardians agreed that they would return to play or play sports in community spaces once it was safe to do so (Szpunar et al.,2021).

Rossi and colleagues, in their research study, performed a comprehensive review to examine the impact of COVID-19 restrictions on children's physical activity and the factors influencing it. The scoping review encompassed multiple databases, namely PubMed, Web of Science, SportDiscus, and BISp-Surf. From the initial pool of 1672 studies, 84 studies were rigorously analyzed and included in the final analysis. The findings of this study shed light on the notable decline in children's physical activity levels during the pandemic. The reduction in physical activity ranged from -10,8 minutes per day to as much as -91 minutes per day. These findings underscore the substantial impact of COVID-19 restrictions on children's engagement in physical activities (Rossi et al., 2021).

They conducted a thorough analysis of seven different databases, specifically focusing on studies involving children and adolescents (≤ 19 years) in the WHO European Region. The aim was to compare physical activity levels during the COVID-19 pandemic with a pre-pandemic baseline, using reliable measurement instruments. By comparing data from before and during the pandemic, they discovered a significant decline in overall physical activity (standardized mean difference [SMD], -.57 [95% CI, -.95; -.20]) as well as moderate-to-vigorous physical activity (SMD, -.43 [95% CI, -.75; -0.10]). This translates to a decrease of 12 minutes per day, which represents a 20% reduction from the WHO recommendation. Remarkably, all forms of physical activity experienced a sharp decrease among European children and adolescents during the COVID-19 pandemic. This decline was particularly noticeable during school closures and predominantly affected younger schoolchildren and adolescents (Ludwig-Walz et al., 2023).

In the case of Argentina, in the context of the COVID-19 epidemic, there was a significant decrease (10,6 percentage points) in out-of-school structured physical activity of children between five and 17 years old (playing a sport or doing a formative physical activity in a club, fitness center or public space) (Tuñón et al., 2022b). However, it is worth asking whether this decline was also registered in active play in public spaces, considering that during this period recreational outings were allowed in the aforementioned spaces, as well as physical activity in squares and parks. Meanwhile, many sports facilities were closed, and their activities were very limited. Even physical education classes remained virtual for a long period, with the limitations that this implies for the child's motor development.

Within this framework, the present paper aims to describe the variations in the deficit of active play in children and adolescents between five and 17 years of age in urban Argentina between the prepandemic periods (2018) and during the COVID-19 confinements (2020). In addition, by means of a multivariate analysis, the sociodemographic, socioeconomic, geographic and behavioral factors associated with this deficit are identified.

Materials and Methods

A quantitative comparative statics design was used to analyze the change in the propensity to active gambling in children and adolescents in the Argentine case, before and during the COVID-19 pandemic. This analysis was based on microdata from the Argentine Social Debt Survey (EDSA for its acronym in Spanish) of the Argentine Social Debt Observatory Program of the Universidad Católica Argentina. EDSA is a multipurpose survey with a probabilistic stratified multistage sample design representative of urban agglomerates of 80,000 inhabitants and above. The baseline measurement is carried out every year between June and October. In the present paper, an analysis is conducted on the population aged between 5 and 17 years in the measurements of the second semester of 2018 and 2020 (5479 and 3964 observations, respectively), 50,2% of males and 49,8% of woman in 2018, and 52,9% of males and 47% of woman in 2020; 39,4% between five and nine years old, 30,5% between ten and 13 years old, 30% between 14 – 17 years old in 2018, and 40,5% between 5 – 9 years old, 31% between ten and 13 years old, and 28,3% between 14 – 17 years old in 2020. During the second semester of the year 2020, recreational outings in public spaces and physical activity in squares and parks were allowed in Argentina. The survey is answered by the child's parent or legal guardian. The dependent variable under analysis is deficit of active play and refers to when the child or adolescent engages in active play less than three times a week. According to WHO (2022), children and adolescents between five and 17 years old should incorporate intense aerobic activities as well as those that strengthen muscles and bones at least three days a week.

The indicator used within the EDSA framework is: "In the last 30 days, how many times a week did (child's name) engage in active games such as jumping rope, skateboarding, tag, hide-and-seek, police-thief, other chase games, riding a bike, rollerblading, playing ball, or other active games in which his/her heartbeat and/or breathing quickens to a greater intensity than when at rest (sitting or lying down)?" (regardless of space, indoors or outdoors). Initially, a descriptive analysis is performed in which the percentage variations between 2018 and 2020 in the dependent variable *active gambling deficit* are considered according to a set of independent variables (Table 1), seeking to capture

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the effect of the context of the Preventive and Compulsory Social Isolation (ASPO for its acronym in Spanish) during the second semester of 2020 in Argentina. The differences are estimated in percentage points (p.p.), and the margins of error for each of the analysis categories (parameter P for the calculation of the sampling error) are estimated for a confidence interval (CI) of 95%.

Table 1.
Operational definitions of the independent variables under consideration

Dimension	Variable	Description	Categories
Sociodemographic indicators	Sex	Sex of child at birth	Male Female
	Age	Age group	5-9 years old 10-13 years old 14-17 years old
Family indicators	Number of children in the household	Number of children in the household between 0 and 17 years old	Up to 3 children More than 3 children
	Socio-occupational stratum of the household	Description of the socio-occupational category of the main breadwinner of the household	Middle professional (employer or university professional) Middle nonprofessional (skilled nonprofessional salaried employee) Low integrated (skilled self-employed or micro-entrepreneur) Low marginal (unskilled worker)
Behavioral indicators	Child's Behavior	Average daily screen exposure	Exposure to television for 2 hours or less Exposure for more than 2 hours Exposure to the Internet for 2 hours or less Exposure for more than 2 hours
	Structured physical activity in out-of-school environments	Engagement in out-of-school physical activity or sports	Yes No
	Physical activity of the adult of reference	Engagement in structured physical activity at least once a week	Yes No
Geographical and social context	Region of the country	Different regions of the country (groups of urban agglomerates)	CABA (Autonomous City of Buenos Aires) Greater Buenos Aires CENTER NOA CUYO NEA PATAGONIA
	Urban area	Urban areas within cities	Neighborhood with urban layout Social housing neighborhood Slum or settlement
ASPO-COVID19 indicator	Survey period	Second semester	Year 2018 Year 2020

Source: own elaboration based on EDSA-Agenda for Equity, Observatory of the Argentine Social Debt, UCA.

Secondly, the descriptive analysis is complemented by a multivariate analysis using a binary logistic regression model. Indeed, the logistic function allows estimating the probability that each child has of having experienced active play deficit in the presence of a series of covariables. At the same time, the logit model estimates the strength of association of each variable controlling the rest of the variables, that is, it eliminates the possibility of one factor confounding the effect of another. In this sense, the strength of the different relationships is observed through the odds ratios yielded by the regression models ("Exp B" coefficient).

In summary, the developed logit model has dependent dummies as variables: (1) *Active play deficit* versus (0) *No deficit*. The independent variables are those detailed in Table 1. The logistic regression model has an acceptable accurate predictive ability (an overall of 63.6%).

Results

As seen in Table 2, the active play deficit between 2018 and 2020 increased by 8.8 p.p. (falling from an average of 3.7 times per week to 3 times, 20%). Females register higher propensity to active play deficit and, additionally, are the ones who seem to have been more affected by the ASPO-COVID-19 context, to the extent that they increased the deficit to a greater extent than their male peers. Although as age increases, the deficit in active play increases, the variation over time affected children between 10 and 13 years old to a greater extent. Likewise, households with fewer children recorded a greater deficit in active play, but they were not the most affected by ASPO-COVID-19; instead, the deficit increased more in households with more children who used to play more frequently. In the same line, it is recognized that the higher the socioeconomic level, the higher the deficit in active play; however, the ASPO situation affected all children.

In geographic terms, it is noticed that the play deficit is higher in the Autonomous City of Buenos Aires and in the Patagonia region, but between 2018 and 2020 the increase of the deficit was higher in the Cuyo and Center regions. There is also an increase in the deficit in working-class neighborhoods in the lower middle strata.

Greater exposure to the Internet, not engaging in structured physical activity and/or belonging to a household where adults also do not engage in physical activity increases the propensity for an active play deficit. However, it is worth asking what the combined effect of these multiple factors was in the ASPO-COVID-19 context.

As shown in Table 3, the ASPO-COVID-19 context effect, represented by the 2020 versus 2018 measurement year, on the active play deficit is significant and estimated at 45% more (Exp (B) of 1,452). Within the framework of this increase in the active play deficit, females register a 39% higher probability of not actively playing than their male peers (Exp (B) of 1,395). As age increases, the propensity for active play deficits increases (70% more in adolescents).

According to household characteristics, children and adolescents in households with fewer members registered higher chances of not playing actively than in larger households (44% more). In addition, as the socioeconomic level increases, the deficit of active play also increases, as evidenced by the increase in Exp (b) (see Table 3). This coincides with the analysis by regions of the country, which indicates that children in the Autonomous City of Buenos Aires (the city with the highest GDP in the country, sociodemographic density and prevalence of horizontal properties) are the ones most lacking in active play (almost three times the chances of deficit than a peer in the Cuyo region). Likewise, a child in the Patagonia region almost doubles the chances of active play deficit than a peer in the

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Cuyo region.

Exposure to television does not seem to compete with active play to the same extent as exposure to the Internet, which is a factor that increases the deficit by about 25%. On the other hand, the deficit of structured out-of-school physical activity of children and parents (adults of reference) increases the propensity for the deficit of active play (53% and 23%, respectively).

Another factor that influences the deficit in active play is the place of residence in the neighborhood. Children in working-class neighborhoods with a formal urban layout registered a greater propensity to active play deficit than their peers in slums or settlements. In poorer neighborhoods, active play in public spaces is more common than in other contexts, as was also the case in the ASPO-COVID-19 context.

In summary, the logit model allows confirming the ASPO-COVID-19 effect on the increase in the active play deficit and main associated factors. These factors are maintained even though the 2018-2020 variations in many cases affected the populations with lower structural deficit, as can be seen in the descriptive type of analysis.

Table 3.
Factors associated with active play deficit
Population between 5 and 17 years old. Argentina, 2018 and 2020.

	Deficit of active play	
	Sig.	Exp(B)
2018 ©		
2020	0.000	1.452
Male ©		
Female	0.000	1.395
5 to 9 years old ©	0.000	
10 to 13 years old	0.000	1.327
14 to 17 years old	0.000	1.704
More than 3 children ©		
3 children or less	0.000	1.447
Low marginal stratum ©	0.000	
Low integrated stratum	0.000	1.216
Middle nonprofessional stratum	0.000	1.877
Middle professional stratum	0.000	2.034
Cuyo ©	0.000	
CABA	0.000	2.682
Greater Buenos Aires	0.958	0.996
Center	0.000	1.483
NOA	0.000	1.443
NEA	0.035	1.266
Patagonia	0.000	1.879
Television less than 2hs average ©		
Television more than 2hs average	0.000	0.777
The Internet less than 2hs average ©		
The Internet more than 2hs average	0.000	1.250
Without deficit of physical activity ©		
With deficit of physical activity	0.000	1.530
Adults of reference without deficit of physical activity ©		
Adults of reference with deficit of physical activity	0.000	1.230
Slum or settlement ©	0.000	
Neighborhood with urban layout	0.002	1.179
Social housing neighborhood	0.000	1.697
Constant	0.000	0.216
Global	63.6%	

Source: own elaboration based on EDSA-Agenda for Equity, Observatory of the Argentine Social Debt, UCA.

Table 2.
Deficit of active play according to sociodemographic, socioeconomic and behavioral factors As a percentage of children between 5 and 17 years old. Argentina, 2018 and 2020.

	Years	2018		2020		Differences 2020-2018	
		Average weekly active play	Deficit of active play	Average Weekly active play	Deficit of active play	Average weekly active play (%)	Deficit of active play (p.p.) *
Total		3.7	53%	3.0	62%	-20%	8.83*
SEX	Male	4.0	49%	3.2	57%	-19%	7.91*
	Female	3.5	57%	2.7	68%	-22%	10.52*
AGE	5 – 9 years old	4.1	47%	3.3	56%	-19%	8.31*
	10 – 13 years old	3.8	52%	2.9	65%	-23%	13.05*
	14 – 17 years old	3.2	62%	2.5	69%	-22%	6.89*
CHILDREN IN THE HOUSEHOLD	3 children or less	3.5	57%	2.9	64%	-18%	6.49*
	More than 3 children	4.4	40%	3.3	56%	-27%	15.86*
STRATUM	Marginal worker	4.1	45%	3.1	56%	-24%	11.18*
	Integrated worker	3.8	51%	3.1	61%	-20%	10.25*
	Middle nonprofessional	3.1	66%	2.6	72%	-17%	5.58*
	Middle professional	2.6	74%	2.1	72%	-18%	-2.58*
REGION	Autonomous City of Buenos Aires	2.7	75%	2.1	81%	-20%	6.56*
	Greater Buenos Aires	4.0	48%	3.3	55%	-17%	7.44*
	CENTER	3.5	57%	2.4	72%	-31%	14.72*
	NOA	3.5	57%	3.0	62%	-14%	5.35*
	CUYO	4.0	46%	3.0	64%	-25%	17.11*
	NEA	3.9	56%	3.0	58%	-21%	1.69
	PATAGONIA	3.3	65%	2.4	74%	-27%	9.16*
Television for more than 2 hours a day per week	Without deficit	3.5	58%	2.8	65%	-18%	6.94*
	Deficit	4.0	49%	3.1	60%	-22%	11.18*
The Internet for more than 2 hours a day per week	Without deficit	4.0	49%	3.0	59%	-23%	10.64*
	Deficit	3.3	62%	2.9	66%	-12%	3.44*
PHYSICAL ACTIVITY	Without deficit	3.7	55%	3.8	46%	1%	-8.19*
	Deficit	3.7	53%	2.6	69%	-29%	15.99*
ADULT PHYSICAL ACTIVITY	Without deficit	3.7	55%	3.0	62%	-18%	6.99*
	Deficit	3.7	53%	3.0	62%	-21%	9.28*
URBAN AREA	Neighborhood with urban layout	3.6	56%	3.0	62%	-15%	5.87*
	Social housing neighborhood	3.7	55%	1.6	76%	-57%	20.50*
	Slum or settlement	4.3	43%	2.9	62%	-32%	19.54*

* Statistically significant variance, p-value<0.05
Source: own elaboration based on EDSA-Agenda for Equity, Observatory of the Argentine Social Debt, UCA.

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Discussion

It is important to note substantial variations observed in our study's findings and those reported by other researchers, according to the objective of this work, which refers to the description of the variations in the active play deficit in children and adolescents, when the pre-pandemic periods (2018) and what happened during the COVID-19 confinements (2020) are compared.

The studies reported in different countries indicate that out-of-school structured physical activity followed a declining trend, and this coincides with data from a previous publication of our own (Tuñón et al., 2022b); this has been negatively reinforced by a decrease in school physical activity. According to Spitzer (2021) more than 1.6 billion children and adolescents globally were affected by school closures in the year 2020.

However, if the proposals for virtual physical education classes had been intensified and generalized in Argentina during the COVID-19 confinements, perhaps it would have been an interesting contribution to improving population physical activity levels in children and adolescents. In relation to the above, the students, although from a higher education institution in Chile, recognized that the physical education subject developed virtually contributed to healthy and pleasant physical activity, among other benefits (Jones Jofré et al., 2023).

Additionally, and as described extensively in this article, there was a decrease in active free play in public spaces.

In this work, it is evident that physical activity associated to recreational play has also been affected by the restrictions and isolation measures. This is so to the extent that between 2018 and 2020 the deficit of active play increased by 8.8 p.p. and the average weekly frequency of active play in public space fell by 20%. The latter phenomenon affected females to a greater extent than males as age rises and socioeconomic status increases; this occurs, in particular, with adolescent children who tend to engage in less structured physical activity and whose parents also tend not to engage in it. Greater exposure to the Internet was also a relevant factor.

According to Kovacs et al., (2021) in the study conducted in 10 countries in Europe, playing outdoors more than 2 hours/day, following a daily routine and being active in online physical education classes increased the odds of having healthy levels of physical activity in countries affected by confinements. Children and adolescents who played outdoors for more than 2 hours/day were more likely to meet the physical activity recommendation (OR = 2.56 [CI 95%, 1.98-3.32]). In heavily affected countries, this was more evident for adolescents than for children. Playing outdoors had a major influence, as the closure of parks, playgrounds and recreational facilities logically reduced children's chances of maintaining an active and healthy lifestyle. On the other hand, in most countries, less than 20% of children and adolescents complied with the physical activity recommendation during the restrictions.

In addition, the concurrent decline in the different physical activity and movement alternatives that children and adolescents tend to engage in seems to have occurred in different societies around the world. For example, Manon Genin et al., (2021) evidenced that in France 42% of children (43.8% males and 39.9% females) and 58.7% of adolescents (57.1% males and 59.7% females) presented reduced levels of physical activity, especially in active transportation and resistance exercises, which showed a significant decrease within the framework of the pandemic. In Canada, only 23.8% of children (19% male and 27.9% female) met physical activity recommendations compared to 13.2% of adolescents (11.4% male and 14.8% female) during COVID-19 restrictions, with lower levels of physical activity. Children and adolescents experienced a significant decrease in all physical activities during the restrictions. The most dramatic decrease occurred in weekly hours of outdoor physical activity and sport during and before restrictions (5.00 to 2.28 and 5.00 to 1.96 hours/week for children and adolescents, respectively) (Moore et al., 2020).

In the study conducted in children and adolescents in Shanghai, China, a decrease in physical activity before the pandemic and during the restrictions caused by the pandemic was observed. Indeed, the average time spent in physical activity decreased drastically from 540 min/week (before the pandemic) to 105 min/week (during the pandemic), which represented a reduction of 435 min on average. Considering both situations, those insufficiently active went from 21.3% to 65.6% (+44.3%, $p<0.001$) and those sufficiently active, from 60% to 17.7% (-42.5%, $p<0.001$). There were no significant differences in those with unsatisfactory levels of activity, evolving from 18.8% to 17.7%, before and during the pandemic (Xiang et al., 2020). Tulchin-Francis et al., (2021) also reported a drop in physical activity levels during the pandemic in children and adolescents in the USA.

In a study assessing changes in physical activity levels among adolescents in southern Croatia, a significant decrease in physical activity levels among adolescents was evident during the COVID-19 pandemic, and these changes were mainly influenced by a decrease in physical activity in males. This is probably due to the fact that children's physical activity is generally determined by participation in formal sports and organized recreational activities (competitive sports in sports clubs and/or recreation in fitness centers and gyms) and the imposed rules of social distancing reduced their possibility to participate in such activities.

Initial physical condition significantly influenced physical activity levels at baseline and follow-up. Initial physical fitness was consistently related to higher physical activity levels in the period in which regular physical activities were limited due to the COVID-19 pandemic. These results could be seen as plausible for other situations in which adolescents' standard physical activity patterns would be compromised and/or significantly modified (e.g., school recess, changes in place of residence, different types of personal

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isolation due to health problems and weather conditions) (Sekulic et al., 2020).

Findlay et al., (2009) found that children having at least one parent with higher education and living in a higher income household had a higher probability of weekly participation in physical activity. Agreeing with these predictors are Seabra et al., (2008); Maric et al., (2020); Dumith et al., (2012); Sterdta et al., (2014); Kemp et al., (2020). These reports are consistent with our data on out-of-school structured physical activity (Tuñón et al., 2022b). However, the specific analysis of active play that usually occurs in public spaces allows recognizing that physical activity in the domain of free play is more deficient among children and adolescents of better socioeconomic status, whereas the deficit of structured physical activity in spaces such as clubs is greater among the poorest and/or most vulnerable. In Argentina, in the context of confinements, children and adolescents in slums or informal neighborhoods played in public spaces such as football fields and playgrounds, among others. Even the confinements were in neighborhoods, whereas in other wealthier social sectors they were inside their own homes.

These results are consistent with those of Chambonniere et al., (2021), who reported in a paper on the effect of COVID-19 confinements on activity and sedentary behaviors in French children and adolescents that access to an outdoor area moderated the change in children's physical activity levels, with 64.2% indicating a decrease in physical activity when they did not have access to an outdoor area, compared to a decrease of only 37.8% among those with individual access to an outdoor area.

In addition, considering the results that show that in the ASPO context, the cities of the interior of the country became facilitating spaces for physical activity and outdoor play in public spaces, perhaps this can be related to what has been affirmed in different publications regarding the time children spend in public spaces as a solid predictor of physical activity (Dumith, et al., 2012; Sterdt, et al., 2014; Chambonniere, et al., 2021).

The COVID-19 epidemic context undoubtedly represented a barrier to active play, combined with a decrease in out-of-school structured physical activity (Tuñón., 2022b) and school physical education stimuli (Tuñón et al., 2022a). Likewise, the analysis shows that children and adolescents who do not engage in structured physical activity are more likely not to engage in active play, as are the children of parents with a low predisposition to physical activity (an important intergenerational component) (Tuñón et al., 2022a).

Conclusion

It is known that insufficient physical activity has a greater effect on females than males, but it is less known - and considered a finding of the present study- the greater predisposition to insufficient physical activity through play of children living in smaller households (with probably none or few siblings). Specially among the most socioeconomically advantaged children, who seem to have been more isolated in the epidemic context than peers from lower social sectors, who found in their neighborhood spaces more opportunities for the exercise of active play.

Although the pandemic context and the restrictive measures had a harmful effect on the movement opportunities of children and adolescents, it is clear that this is a pre-existing issue, which registers notably elevated deficiencies. The deficit of play has various impacts on the different stages of child development (physical, motor and socialization stages, among others).

Moreover, play is a recognized right of children and adolescents (art. 31, Convention on the Rights of the Child) that is related to the well-being of the child and, in this sense, considered a healthy practice. There is broad consensus that children's play represents a phenomenon and behavior in which physical activity and energy expenditure are linked, which means that it is a relevant manifestation of children's physical activity that additionally helps to face the problem of overweight and obesity that increasingly affects children. Hence, active play should be considered an essential behavior in childhood and should be promoted under all circumstances from an integral health approach. On the other hand, and in this context, the time spent in front of screens, so necessary for education, socialization and leisure, should be balanced with physical activity that meets healthy objectives.

While this study has the limitation of using reporting indicators, they are highly valuable when conducted on large representative samples because they better define issues and guide their solutions. To conclude, undoubtedly, in light of the global public health economic costs of insufficient levels of physical activity, it seems necessary to review the additional barriers to physical activity and active play posed by isolation measures and restrictions to prevent the social circulation of SARS-CoV2 in children and adolescents. Considering the potential emergence of future virus variants or pandemics, there is a pressing need to implement innovative interventions to keep children and adolescents physically active, taking into account active play as a fundamental resource. In accordance with the previously discussed and in the context of this pandemic, it is clear that the anticipated costs may surpass pre-COVID-19 estimations.

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