RESEARCH ARTICLE

Multilevel analysis concerning the relationship between social vulnerability and the healthy use of leisure time in children and adolescents in Argentina: A national population-based study [version 1; peer review: awaiting peer review]

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V1 First published: 09 Oct 2018, 7:1619
<https://doi.org/10.12688/f1000research.16273.1>
 Second version: 12 Oct 2018, 7:1619
<https://doi.org/10.12688/f1000research.16273.2>
 Latest published: 07 May 2021, 7:1619
<https://doi.org/10.12688/f1000research.16273.3>

Abstract

Background: Leisure time is a human right and has to be considered part of any health promotion initiative aimed at children and adolescents. The objective of this study was to analyze the relationship between social vulnerability and the healthy use of leisure time in children and adolescents in urban contexts of Argentina, in 2012.

Methods: A cross-sectional and analytical study using data from the Module on Activities of Girls, Boys and Adolescents of the Annual Urban Household Survey was carried out. In this survey, a self-administered instrument was applied to 25,915 individuals aged from 5 to 17. A Social Vulnerability Index (SVI) was developed. Association was estimated by multilevel logistic regression.

Results: Children and adolescents use most of their leisure time to carry out school activities (90.1%) with art activities having the lowest percentage (21.8%). In the multilevel models on the relationship between a high SVI and non-performance of socialization activities, the OR was 1.99 ($p = 0.002$, 95% CI: 1.28-3.12). The association between high SVI and non-use of ICT gave an OR of 14.17 ($p \leq 0.001$, 95% CI: 5.13-39.17), and between high SVI and non-use of internet, an OR of 21.89 ($p \leq 0.001$, 95% CI: 7.50-63.88).

Conclusions: A high SVI negatively impacts on some healthy activities of leisure time for children and adolescents in Argentina. The SVI

Open Peer Review

Approval Status

	1	2
version 3		
(revision)		
07 May 2021		
version 2		
(revision)		
12 Oct 2018		
version 1		
09 Oct 2018		

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could be a useful tool to guide health promotion initiatives in this population.

Keywords

Children, Adolescent, Recreation, Social Vulnerability, Health Promotion, Argentina

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Author roles: **Moyano D:** Conceptualization, Formal Analysis, Investigation, Methodology, Project Administration, Validation, Visualization, Writing – Original Draft Preparation, Writing – Review & Editing; **Forclaz Z:** Supervision, Validation, Visualization, Writing – Original Draft Preparation, Writing – Review & Editing; **Chaparro RM:** Data Curation, Formal Analysis, Investigation, Methodology, Validation, Visualization, Writing – Original Draft Preparation, Writing – Review & Editing; **Hernández-Vásquez A:** Methodology, Validation, Visualization, Writing – Original Draft Preparation, Writing – Review & Editing; **Perovic NR:** Conceptualization, Supervision, Validation, Writing – Original Draft Preparation, Writing – Review & Editing

Competing interests: No competing interests were disclosed.

Grant information: The author(s) declared that no grants were involved in supporting this work.

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How to cite this article: Moyano D, Forclaz Z, Chaparro RM *et al.* **Multilevel analysis concerning the relationship between social vulnerability and the healthy use of leisure time in children and adolescents in Argentina: A national population-based study** [version 1; peer review: awaiting peer review] F1000Research 2018, 7:1619 <https://doi.org/10.12688/f1000research.16273.1>

First published: 09 Oct 2018, 7:1619 <https://doi.org/10.12688/f1000research.16273.1>

Introduction

Leisure time allows children and adolescents to participate in a diverse range of activities that contribute to developing their identity, improve their self-regulation and express their interests. Several studies show that extracurricular activities benefit the positive development of the child-adolescent population¹⁻³.

In recent decades, Argentina has made notable progress in expanding the rights of children and adolescents through the adoption and promulgation of various laws, and the adoption, and ratification of the Rights of the Child. Despite the progress made in the legal and institutional framework in 2011–2012, it was observed that 30.1% of children in Argentina were affected by multidimensional poverty⁴.

Social vulnerability in children and adolescents is a central element in the definition of social protection policies⁵ that seek to improve the quality of life in children and adolescents⁶ and promote healthy free-time uses⁷.

Today, leisure time is considered a right. This is claimed by the Convention on the Rights of the Child⁸, in which it is understood as a time for rest and leisure⁷, and it is considered a necessary element in the approach to health promotion⁹; but it is also one of the main social determinants of health¹⁰.

Previous studies indicate that the use of leisure time is related to social vulnerability in children and adolescents¹¹⁻¹³. In these, it is observed that as the social stratum diminishes, the low performance of extracurricular recreational activities (sports, art and cultural) increases and the probability of not having access to this type of incentives increases¹⁴. The social inequality gap in socialization opportunities is significant and clearly regressive for children and adolescents living in poverty in Argentina¹⁴. On the other hand, gender socialization may be an important mechanism to both understand and counteract observed differences in participation in free-time activities among genders^{12,14,15}.

The scarce evidence documented in the field explored in the Argentina and Latin America highlights the importance of the production of knowledge of the impact of social vulnerability on the healthy use of leisure time in children and adolescents in order to contribute to the quality of life and health of this group from a holistic and integral perspective.

The main objective of this study was to analyze the relationship between social vulnerability and the healthy use of leisure time of children and adolescents in urban contexts in Argentina in 2012.

Methods

Study design and sample

This was a cross-sectional, analytical study of a secondary database of the Module on Activities of Girls, Boys and Adolescents (MANNyA)¹⁶ that was included as part of the Annual Urban Household Survey (EAHU, by its Spanish initials) during 2012. The MANNyA was carried out on the basis of an

inter-institutional initiative between the Ministry of Labor, Employment and Social Security, the National Secretariat for Children, Youth and Family, the National Commission for the Eradication of Child Labor, the National Institute of Statistics and Censuses (INDEC, by its Spanish initials) and the Provincial Statistical Offices.

The sample consisted of children and adolescents aged 5 to 17 from urban conglomerates in Argentina. It was a probabilistic, stratified and multi-stage sample of 34,487 households, with a total of 25,915 children and adolescents surveyed¹⁶.

Data collection instruments

The data from the MANNyA secondary database¹⁶, the basis of this analysis, was collected using a self-administered instrument. The databases of MANNyA 2012 are public and can be obtained in the [web site of INDEC](#).

The instrument included closed-ended questions aimed at obtaining what children and adolescents usually do in their leisure time.

Result variable

“*Healthy use of leisure time*”, defined as the time for rest and leisure activities, play and recreational activities suitable for the age. It also implies the right to participate freely in cultural life and the arts⁷. In the framework of the analyzed module, leisure time activities are defined as everything that the child does before or after school, or on the weekends¹⁶.

The dimensions of analysis for this study were:

- School activities (homework or studying for school);
- Sports/physical recreation (football, swimming, cycling/horseback riding, etc.);
- Art (painting, theatre, music, dance, language or art-related workshop or course);
- Socialization (going out with friends to the cinema, to the square, to the cyber cafe, etc.);
- Use of Information and Communication Technologies (ICT; computer or netbook); and
- Internet use

Explanatory variable

“*Social vulnerability*”, defined as the situations of insecurity and defenselessness experienced by communities, families, and individuals in their livelihood conditions, as a consequence of the impact caused by any socio-economic event. In addition, the management of resources and the strategies used by them to cope with the effects of this event were considered¹⁷. Today, social vulnerability is considered one of the main social determinants of health¹⁰, where most health problems can be attributed to people’s socio-economic conditions.

For the construction of this variable, a Social Vulnerability Index (SVI) was prepared ([Table 1](#)) based on the data from the

Table 1. Construction of the social vulnerability index.

Dimension	Categories/Definition	Weighting ***
Overcrowding	- Households with "moderate" overcrowding (>2 and ≤3 people per room) *	0.10
	- Households with "critical" overcrowding (>3 people per room) *	0.10
Housing	- Households with moderate housing material quality (Calmat 3) **	0.10
	- Households with critical housing material quality (Calmat 4 or 5) **	0.15
Occupation	- Households with 2 to 4 members per household head employed	0.30
	- Households with 5 or more members per household head employed	0.30
	- Households not receiving any income from work, retirement or pension	0.30
Health Coverage	- Households with head employed without health coverage	0.15
Education	- Households whose head has an average of <7 years of schooling	0.25
	- Households whose head has an average of >7 and <12 years of schooling	0.10

* It represents the ratio between the total number of people in the household and the total number of rooms or spaces available in the household (excluding bathroom(s) and kitchen(s)) (Instituto Nacional de Estadísticas y Censos).

**The predominant materials of the constituent components of the dwelling (floors, walls, and roofs) are assessed and categorized in relation to their strength, resistance, and capacity for thermal, waterproof, and sound insulation. The dwellings are classified as:

Calmat I and II: the dwelling was made from resistant and solid materials used in floors and roofs, although it may/ may not incorporate insulating or finishing elements in at least one of these. Mosaic/tile/wood/ceramic/carpet floors were considered. The roof had a membrane/asphalt singles and did have a ceiling/interior cladding.

Calmat III: the dwelling was made from resistant and solid materials used in floors and roofs, but it lacks elements of insulation or finishing in all of these. Cement floor/fixed brick floor was considered. Roof with tile/slab roof without any cover, slate/clay tile, and no ceiling/interior cladding.

Calmat IV and V: the dwelling was made of non-resistant materials in at least one of the constituent components. Loose brick/earth floor and roofs of sheet metal without cover, fiber cement/plastic sheet, corrugated roofing sheet, cane/board/straw with mud/ straw alone were considered and there was no ceiling/interior cladding.

***In the weighting structure, greater importance has been given to the *occupation* dimension (dependency burden of income earners), given that the association of the population with the labor market becomes a key factor in social vulnerability, and monetary income can change the situation of social inclusion/exclusion more immediately.

MANNyA secondary database¹⁶. The dimensions and weighting values of the conceptualization of social vulnerability were based on previous publications^{17,18}.

The categories included material assets, such as employment and housing, and non-material assets, such as those related to human capital (access to the health system and educational system of the head of household).

The construction of the SVI was based on the selection of dimensions represented by different categories which, depending on the risk situation, were defined as «moderate» or «critical».

Since each of the selected categories may have different levels of intensity, it was decided to define differential weights within them¹⁸.

Next, the SVI of each household where the child or adolescent is living was categorized as follows: without SVI was assigned to those cases with a value of 0.00; low or moderate SVI was assigned to those cases with values between >0.00 and ≤0.45; high SVI was assigned to those cases with values greater than 0.45.

Statistical analysis

The variables of interest were analyzed descriptively using position and dispersion measurements and frequency distribution.

Given the hierarchical structure of the data (individuals grouped in regions of the country), a multilevel logistic regression analysis was conducted to explore the relationship between the social vulnerability and the healthy use of leisure time. The models considered socio-economic and socio-demographic variables at two levels: an individual level, relating to the child/adolescent (performance of domestic and economic activities, gender, age, school attendance, health coverage, illiteracy), and a household level (level of education of the head of household). An empty model (Model 0) was performed, and the level 2 variance (household) and the intraclass correlation coefficient (ICC) were calculated.

Firstly, a univariate analysis was carried out and, from the variables that resulted in statistical significance, a multivariate model of random intersection was constructed by introducing one variable at a time. The standard errors were calculated taking into account the cluster effect of each region of the country. The variable-addition models were compared using

the *likelihood ratio test*. The proportion of the variance at level 2 explained (PVE) by the different models was calculated as $PVE = (V) \times 100$.

The statistical package Stata® v14.2 (Stata Corporation, College Station, Texas, USA) was used for all the analyses, and a $p < 0.05$ value was considered statistically significant.

Ethical considerations

The study was carried out on the basis of a secondary analysis of the MANNyA database¹⁶, compiled by different public bodies under the leadership of the INDEC. In Argentina, public statistics produced by the State are part of the National Statistical System created by Law No. 17622, which guarantees confidentiality and the Protection of Personal Data through Law No. 25326.

The database is currently public and open-access, and is identified by the responsible public body¹⁹. Thus, this study did not require an evaluation by an ethics committee and, in addition, qualifies for the status of being exempt from obtaining informed consent.

Results

Descriptive phase

As shown in **Table 2**, the sample consisted of 52.6% males and 63.5% adolescents. In total, 32.2% of the respondents were from Gran Buenos Aires and 30.9% from the Pampas region. It is also observed that 95.5% were attending school at the time of the survey and 58.1% had some kind of health coverage.

Table 3 shows the prevalence of activities of healthy use of leisure time, according to socio-demographic characteristics. It was observed that the prevalence of performance of school activities was 90.1%, higher in the group with health coverage (91.9%) and in the literate group (92.6%). Art activities (21.8%) had the lowest prevalence of performance as compared to the other activities of free-time use.

The socialization, sports/recreational activities, use of ICTs and the Internet showed an intermediate prevalence between 51.1% and 74.2%, being, in most cases, higher in males than in females. Also, lower values are observed in groups that do not attend school, do not have health coverage and are illiterate.

Table 4 shows the main results of the subgroup analysis. In the group without SVI (10.9% of the sample), it was observed that the highest prevalence was the performance of school activities (90.9%), with the art activities being the least prevalent (19.2%).

Among those with a low or moderate SVI (87.1%), the distribution of the performance of leisure time activities was the same as that of the group without SVI, although with higher values in the cases of ICTs (75.1%), Internet (66.7%) and art activities (22.4%).

In the group composed of those with a high SVI (2.1%), the distribution of the performance of leisure time activities

Table 2. Sociodemographic characteristics of children and adolescents in Argentina, 2012 (n=25,915).

Characteristics	n (%)
Sex	
Female	12,689 (47.4)
Male	13,226 (52.6)
Life Stage	
Childhood	9,307 (36.5)
Adolescence	16,608 (63.5)
Region	
Greater Buenos Aires	1,370 (32.2)
Cuyo	2,570 (7.2)
Northeast	4,398 (10.9)
Northwest	5,894 (13.6)
Pampas	6,027 (30.9)
Patagonia	5,656 (5.9)
Current School Attendance	
Yes	24,735 (95.5)
No	1,180 (4.5)
Health Coverage	
Yes	14,901 (58.1)
No	11,014 (41.9)
Knows How to Read and Write	
Yes	1,925 (7.3)
No	23,990 (92.7)
Social Vulnerability Index (SVI)	
Without social vulnerability	3,220 (10.9)
Low/moderate social vulnerability	22,044 (87.1)
High social vulnerability	651 (2.1)

Values expressed in proportions (%).

School Attendance of the child/adolescent defined as: self-report of attending school at the time of the survey.

Health Coverage of the child/adolescent defined as: health insurance (including Comprehensive Medical Attention Program (PAMI), mutual/prepaid/emergency service). Public plans and insurance were not considered as coverage.

Child/adolescent **Does Not Know How to Read or Write** defined as: self-reporting of not knowing how to read or write at the time of the survey.

Social Vulnerability Index (SVI) of the child/adolescent defined as: The SVI of each household where the child or adolescent is included according to the categories (Without SVI: value of 0.00/SVI low/moderate: >0.00 and ≤ 0.45 /SVI high: >0.45).

Life Stage of children/adolescents defined as: childhood <10 years old and adolescence ≥ 10 to 19 years old according to the WHO classification.

Data Weighted by age and gender stratum for each city to represent the general population.

Table 3. Prevalence of activities of healthy use of leisure time according to sociodemographic characteristics in children and adolescents from Argentina, 2012 (n= 25.915).

Activities	School			Sports/recreational			Art			Socialization			ICT			Internet		
	%	SE	(95%CI)	%	SE	(95%CI)	%	SE	(95%CI)	%	SE	(95%CI)	%	SE	(95%CI)	%	SE	(95%CI)
Total	90.1	0.4	(89.4-90.8)	53.6	0.7	(54.9-47.7)	21.8	0.5	(20.8-22.8)	51.1	0.6	50.0-52.3	74.2	0.6	(0.73- 0.75)	65.60	0.66	(0.64- 0.67)
Sex																		
Male	88.88	0.55	(87.76- 89.91)	62.99	0.88	(61.25- 64.69)	18.31	0.62	(17.13- 19.55)	54.06	0.83	(52.42- 55.69)	74.55	0.78	(72.99- 76.05)	65.23	0.85	(63.54- 66.88)
Female	91.54	0.44	(90.65- 92.36)	43.23	0.88	(41.50- 44.97)	25.66	0.75	(24.22-27.16)	74.78	0.86	(46.10- 49.46)	73.80	0.75	(72.30- 75.26)	66.01	0.80	(64.42- 67.57)
Life Stage																		
Childhood	87.29	0.61	(86.04- 88.45)	48.39	0.99	(46.45- 50.34)	17.30	0.68	(16.01- 18.66)	24.47	0.77	(22.99- 26.01)	61.36	0.93	(59.52- 63.17)	47.79	0.97	(45.90- 49.69)
Adolescence	91.78	0.44	(90.87- 92.60)	56.63	0.77	(55.10- 58.14)	24.37	0.67	(23.08- 25.71)	66.36	0.75	(64.87- 67.81)	81.56	0.67	(80.22- 82.83)	75.82	0.72	(74.39- 77.20)
Region																		
Greater Buenos Aires	88.90	0.98	(86.82- 90.69)	45.33	1.65	(42.11- 48.58)	18.44	1.28	(16.07- 21.08)	42.67	1.54	(39.69- 45.71-)	78.59	1.55	(75.40- 81.48)	72.31	1.65	(68.96- 75.42)
Cuyo	89.93	0.79	(88.26- 91.39)	48.52	1.53	(45.53- 51.51)	17.94	1.11	15.86- 20.24)	56.57	1.44	53.72) (59.37-	75.76	1.38	(72.96- 78.36)	61.33	1.60	(58.15- 64.42)
Northeast	91.39	0.57	(90.21- 92.45)	63.45	1.10	(61.26- 65.59)	23.11	0.95	(21.29- 25.03)	46.82	1.08	44.71) (48.95-	60.61	1.19	(58.26- 62.92)	47.21	1.21	(44.85- 49.58)
Northwest	90.94	0.47	(89.97- 91.82)	56.17	0.97	(54.25- 58.06)	21.59	0.75	(20.14- 23.11)	55.35	0.91	(53.56- 57.11)	64.88	0.99	(62.90- 66.81)	55.19	1.03	(53.16- 57.20)
Pampas	90.67	0.50	(89.64- 91.61)	57.56	1.03	(55.52- 59.57)	24.61	0.86	22.96- 26.34)	57.37	0.98	(55.44- 59.27)	77.18	0.91	(75.35- 78.91)	70.08	1.00	(68.09- 72.01)
Patagonia	90.26	0.69	(88.82- 91.53)	61.29	1.12	(58.91- 63.63)	28.80	1.11	(26.62- 31.08)	55.86	1.16	(53.58- 58.13)	79.84	0.11	(77.52- 81.98)	69.14	1.24	(66.65- 71.52)
Current School Attendance																		
Yes	93.22	0.31	(92.58- 93.80)	54.44	0.67	(53.12- 55.76)	22.38	0.54	(21.34- 23.45)	50.67	0.64	(49.43- 51.92)	74.95	0.60	(73.75- 76.11)	66.24	0.65	(64.95- 67.50)
No	25.25	0.24	(20.88- 30.19)	36.31	2.55	(31.47- 41.44)	9.51	1.42	(7.07- 12.69)	59.75	2.74	(54.29- 64.98)	58.35	2.63	(53.13- 63.39)	52.15	2.68	(46.89- 57.35)
Health Coverage																		
Yes	91.85	0.43	(90.96- 92.66)	58.39	0.83	(56.76- 60.00)	26.35	0.71	(14.07- 16.97)	54.03	0.79	(52.46- 55.59)	82.98	0.61	(81.75- 84.13)	75.32	0.70	(73.92- 76.67)
No	87.77	0.64	(86.47- 88.96)	47.01	1.07	(44.92- 49.10)	15.47	0.74	(24.98- 27.78)	46.99	1.01	(45.03- 48.97)	62.02	1.11	(59.82- 64.16)	52.12	1.14	(49.88- 54.34)
Knows How to Read and Write																		
No	58.52	0.35	(54.49- 62.44)	35.60	1.96	(31.86- 39.53)	8.62	0.89	(7.02- 10.54)	14.78	1.26	(12.48- 17.43)	41.78	2.08	(37.77- 45.91)	29.15	1.98	(25.42- 33.18)
Yes	92.63	2.03	(91.90- 93.29)	55.04	0.68	(53.69- 56.38)	22.83	0.55	(21.76- 23.93)	53.93	0.65	(52.66- 55.20)	76.74	0.61	(75.52- 77.92)	69.46	0.67	(67.15- 69.75)
SVI																		
Without SVI	90.9	0.01	(88.9-92.5)	54.9	0.2	(51.2-58.6)	19.2	0.1	(16.9-21.8)	50.9	0.2	46.8-54.9)	72.5	0.2	(69.2-75.6)	63.1	0.2	(59.5-66.5)
Low/moderate SVI	90.2	0.04	(89.4-91.0)	53.6	0.1	(52.2-55.0)	22.4	0.01	(21.2-23.5)	51.5	0.01	(50.2-52.8)	75.1	0.07	(73.8-76.4)	66.7	0.01	(65.2-68.1)
High SVI	83.1	0.3	(75.8-88.5)	48.1	0.4	(40.1-56.1)	11.4	0.2	(7.6-16.6)	36.3	0.4	(29.9-44.3)	45.1	0.5	(35.7-54.9)	33.7	0.5	(25.4-43.2)

SE: Standard Error.

95%CI: 95% Confidence Interval.

Values expressed in proportions (%).

Life Stage defined as: childhood <10 years old and adolescence ≥ 10 to 19 years old according to the WHO classification.

Region of the child/adolescent defined as: Greater Buenos Aires, Cuyo, Northeast, Northwest, Pampa, and Patagonia.

School Attendance of the child/adolescent defined as: self-report of attending school at the time of the survey.

Table 4. Prevalence of healthy use of leisure time activities within each stratum of social vulnerability of children and adolescents in Argentina according to sociodemographic characteristics, 2012 (n= 25,915).

Without SVI																		
Activities	School			Sport/recreational			Art			Socialization			ICT			Internet		
	%	SE	(95%CI)	%	SE	(95%CI)	%	SE	(95%CI)	%	SE	(95%CI)	%	SE	(95%CI)	%	SE	(95%CI)
Total	90.9	0.0	(88.9-92.5)	54.9	0.2	(51.2-58.6)	19.2	0.1	(16.9-21.8)	50.9	0.2	(46.8-54.9)	72.5	0.2	(69.2-75.6)	63.1	0.2	(59.5-66.5)
Sex																		
Male	88.3	0.1	(85.2-90.8)	62.6	0.2	(58.2-66.8)	15.3	0.1	(12.8-18.2)	54.3	0.3	(48.7-59.7)	72.8	0.2	(68.4-76.7)	62.9	0.2	(58.2-67.5)
Female	94.3	0.1	(92.5-95.6)	44.9	0.3	(39.9-49.9)	24.3	0.2	(20.7-28.4)	46.4	0.2	(41.7-51.1)	72.1	0.2	(68.0-75.9)	63.2	0.2	(58.7-67.5)
Life Stage																		
Childhood	88.8	0.2	(85.2-91.5)	45.9	0.3	(40.9-51.0)	16.1	0.2	(12.8-20.1)	25.4	0.2	(21.2-30.1)	54.9	0.3	(49.5-60.1)	41.3	0.3	(36.1-46.7)
Adolescence	92.0	0.1	(89.7-93.9)	59.7	0.2	(55.2-64.1)	20.9	0.2	(17.9-24.3)	64.5	0.2	(59.7-69.1)	81.9	0.2	(78.4-85.0)	74.7	0.2	(70.9-78.2)
Region																		
Greater Buenos Aires	92.3	0.2	(85.9-96.0)	42.6	0.5	(32.9-52.9)	10.1	0.2	(5.7-17.1)	37.1	0.6	(26.2-49.5)	78.3	0.4	(69.1-85.3)	66.9	0.5	(57.3-75.3)
Cuyo	91.1	0.2	(85.9-94.4)	42.4	0.4	(35.1-49.9)	16.0	0.3	(11.1-22.5)	53.4	0.4	(45.8-60.9)	74.5	0.3	(67.1-80.8)	60.6	0.4	(53.1-67.6)
Northeast	92.4	0.1	(89.6-94.5)	66.5	0.3	(60.9-71.6)	17.8	0.2	(14.2-22.1)	45.3	0.2	(40.5-50.2)	59.6	0.3	(53.9-65.0)	44.8	0.3	(39.4-50.4)
Northwest	90.8	0.1	(87.9-93.1)	55.1	0.2	(50.6-59.6)	21.3	0.2	(17.8-25.2)	57.3	0.2	(52.8-61.7)	63.3	0.2	(58.5-67.9)	56.2	0.2	(51.3-61.0)
Pampas	89.3	0.2	(85.3-92.3)	61.2	0.3	(54.4-67.6)	26.0	0.2	(21.5-31.0)	58.8	0.4	(51.7-65.6)	76.3	0.3	(69.3-82.1)	70.4	0.3	(63.2-76.7)
Patagonia	89.5	0.2	(85.1-92.8)	65.0	0.3	(58.5-71.0)	24.7	0.3	(19.0-31.5)	59.4	0.4	(52.3-66.2)	80.2	0.3	(74.6-84.8)	69.7	0.3	(63.4-75.4)
With low/moderate SVI																		
Activities	School			Sport/recreational			Art			Socialization			ITC			Internet		
	%	SE	(95%CI)	%	SE	(95%CI)	%	SE	(95%CI)	%	SE	(95%CI)	%	SE	(95%CI)	%	SE	(95%CI)
Total	90.2	0.04	(89.4-91.0)	53.6	0.1	(52.2-55.0)	22.4	0.01	(21.2-23.5)	51.5	0.0	(50.2-52.8)	75.1	0.1	(73.8-76.4)	66.7	0.0	(65.2-68.1)
Gender																		
Male	89.0	0.06	(87.8-90.1)	63.2	0.1	(61.3-65.1)	18.8	0.1	(17.5-20.2)	54.4	0.1	(52.7-56.1)	75.5	0.1	(73.8-77.1)	66.3	0.1	(64.5-68.1)
Female	91.5	0.0	(90.6-92.4)	43.2	0.1	(28.4-49.2)	26.2	0.1	(24.6-27.8)	48.3	0.1	(46.5-50.1)	74.7	0.1	(73.1-76.2)	67.0	0.1	(65.3-68.7)
Life Stage																		
Childhood	87.1	0.1	(85.7-88.4)	48.9	0.1	(46.8-51.0)	17.7	0.1	(16.3-19.2)	24.5	0.1	(22.9-26.1)	63.1	0.1	(61.1-65.0)	49.5	0.1	(47.4-51.5)
Adolescence	92.0	0.0	(91.0-92.9)	56.3	0.1	(54.7-57.9)	25.1	(0.1	(23.6-26.5)	67.0	0.1	(65.5-68.6)	82.0	0.1	(80.6-83.4)	76.6	0.1	(75.1-78.1)
Region																		
Greater Buenos Aires	88.8	0.1	(86.6-90.7)	45.6	0.2	(42.2-49.1)	19.5	0.1	(16.9-22.3)	43.6	0.2	(40.5-46.8)	69.2	0.1	(66.5-71.7)	73.3	0.2	(69.7-76.6)
Cuyo	90.0	0.1	(88.2-91.6)	49.4	0.2	(46.1-52.7)	18.3	0.1	(16.0-20.8)	57.0	0.2	(53.9-60.1)	76.5	0.1	(73.5-79.4)	62.0	0.2	(58.5-65.4)
Northeast	91.5	0.1	(90.2-92.6)	63.3	0.1	(60.9-65.6)	24.3	0.1	(22.3-26.5)	47.7	0.1	(45.3-50.1)	62.0	0.1	(59.4-64.5)	48.8	0.1	(46.2-51.5)
Northwest	91.1	0.1	(90.1-92.1)	56.8	0.1	(56.7-58.9)	22.3	0.1	(20.6-24.0)	55.4	0.1	(53.5-57.4)	66.3	0.1	(64.1-68.4)	56.2	0.1	(53.9-58.4)
Pampas	90.9	0.2	(89.8-91.9)	57.2	0.1	(55.1-59.3)	24.6	0.1	(22.8-26.4)	57.5	0.1	(55.5-59.5)	77.8	0.1	(76.0-79.6)	70.6	0.1	(68.6-72.6)
Patagonia	90.3	0.1	(88.8-91.7)	60.9	0.1	(58.3-63.4)	29.3	0.3	(19.0-31.5)	55.4	0.1	(52.9-57.8)	79.9	0.1	(77.4-82.2)	69.2	0.1	(66.5-71.7)

Activities	With high SVI																	
	School			Sport/recreational			Art			Socialization			ICT			Internet		
	%	SE	(95%CI)	%	SE	(95%CI)	%	SE	(95%CI)	%	SE	(95%CI)	%	SE	(95%CI)	%	SE	(95%CI)
Total	83.1	0.3	(75.8-88.5)	48.1	0.4	(40.1-56.1)	11.4	0.2	(7.6-16.6)	36.3	0.4	(29.9-44.3)	45.1	0.5	(35.7-54.9)	33.7	0.5	(25.4-43.2)
Sex																		
Male	86.9	0.3	(80.6-91.4)	56.3	0.5	(46.7-65.6)	13.2	0.3	(8.0-20.5)	39.7	0.6	(29.5-50.8)	47.0	0.6	(35.5-58.8)	32.5	0.6	(22.4-44.5)
Female	78.5	0.6	(64.7-88.0)	38.3	0.5	(28.4-49.2)	9.2	0.2	(5.6-14.7)	32.2	0.5	(23.4-42.5)	42.9	0.6	(31.5-55.1)	35.1	0.6	(24.2-47.9)
Life Stage																		
Childhood	88.0	0.3	(80.5-92.9)	39.7	0.5	(30.4-49.7)	7.7	0.3	(3.7-15.2)	19.5	0.3	(13.6-27.1)	22.8	0.5	(14.7-33.6)	12.0	0.3	(7.7-18.2)
Adolescence	80.0	0.5	(68.0-88.2)	53.3	0.5	(43.9-62.5)	13.7	0.3	(8.7-20.8)	46.8	0.5	(36.5-57.4)	59.1	0.6	(47.7-69.6)	47.4	0.6	(35.3-59.8)
Region																		
Greater Buenos Aires	72.5	1.1	(46.9-88.7)	44.1	1.3	(21.6-69.2)	5.3	0.5	(1.0-29.8)	17.5	0.8	(6.4-39.5)	22.1	1.5	(4.7-62.0)	43.4	1.5	(18.9-71.6)
Cuyo	83.0	0.5	(69.9-91.1)	46.0	0.1	(32.3-60.4)	14.8	0.7	(5.6-33.7)	53.8	0.8	38.1-68.8)	54.3	0.9	(36.8-70.8)	42.5	0.9	(26.8-59.9)
Northeast	83.8	0.4	(74.1-90.3)	54.1	0.7	(39.5-68.0)	11.1	0.3	(5.9-19.9)	27.3	0.4	(19.4-36.9)	24.1	0.6	(14.7-36.9)	9.6	0.3	(5.0-17.6)
Northwest	88.0	0.2	(82.2-92.1)	47.7	0.5	(38.7-56.8)	10.5	0.2	(1.0-16.3)	48.0	0.5	(38.9-57.1)	45.1	0.4	(37.0-53.4)	34.5	0.4	(26.4-43.8)
Pampas	86.3	0.4	(75.0-93.0)	49.5	0.8	(33.9-65.1)	17.4	0.6	(8.5-32.6)	36.9	0.9	(21.2-56.0)	45.8	1.1	(26.1-66.9)	35.1	0.9	(19.4-54.7)
Patagonia	100.0	.	.	51.0	1.1	(30.6-71.1)	21.1	0.6	(11.7-34.9)	80.4	1.3	(44.6-95.4)	22.1	1.5	(4.7-62.0)	22.1	1.5	(4.7-62.0)

SE: Standard Error.

95%CI: 95% Confidence Interval.

Values expressed in proportions (%).

Social Vulnerability Index (SVI) of the child and adolescent defined as: The SVI of each household where the child or adolescent is included according to the cohort categories of: Without SVI: value of 0.00/low/moderate SVI: >0.00 and ≤0.45/ high SVI: >0.45.

Life Stage defined as: childhood <10 years old and adolescence ≥ 10 to 19 years old according to the WHO classification.

Region of the child and adolescent defined as: Greater Buenos Aires, Cuyo, Northeast, Northwest, Pampas, and Patagonia.

Data Weighted by age and gender stratum for each city to represent the general population.

Health Coverage of the child and adolescent defined as: health insurance (including Comprehensive Medical Attention Program (PAMI), mutual/prepaid/emergency service), Public plans and insurance were not considered as coverage.

Child/adolescent **knows how to read or write** defined as: self-reporting of not knowing how to read or write at the time of the survey.

Social Vulnerability Index (SVI) of the child and adolescent defined as: The SVI of each household where the child or adolescent is included according to the cohort categories of: Without SVI: value of 0.00/low/moderate SVI: >0.00 and ≤0.45/ high SVI: >0.45.

Data Weighted by age and gender stratum for each city to represent the general population.

changes as compared to the other two groups of SVI. While school activities (83.1%) and art activities (11.4%) continues to be the most and least popular choice, respectively, sports/recreational activities are in second place (48.1%), replacing ICTs, which have moved into third place (45.1%). In turn, socialization activities (36.3%) were more prevalent than Internet use (33.7%).

Analytical phase

In the multilevel models, statistically significant associations between some leisure time use activities and social vulnerability are seen (Table 5).

In the multilevel model, the non-performance of school activities was statistically associated with low/moderate SVI, with an OR of 1.165 ($p=0.023$).

In analyzing the relationship between high SVI and the risk of not performing sports/recreational activities, it was observed that the OR was 1.292, although this association was not significant ($p=0.088$).

With respect to the relationship between high SVI and the non-performance of art activities, an OR of 2.232 was found; that is, a higher risk of not performing these activities, being statistically significant ($p\leq 0.001$). This was similarly reflected in the relationship between SVI in the highest stratum and the socialization activities (OR 1.999 and $p\leq 0.002$).

With respect to the relationship between high SVI and the non-use of ICTs, a statistically significant association was observed, in which the OR was 14.171; that is, high SVI resulted to be a risk factor ($p=0.000$). On the other hand, it could be observed that the non-use of the Internet during leisure time in the group with high SVI yielded an OR of 21.887, being significant ($p\leq 0.000$).

Based on the aforementioned, in the final models (Model 3), which considered individual and contextual variables, a clear upward gradient in the likelihood of unhealthy use of leisure time is observed when there are increased SVI levels in the cases of art, socialization, ICT, and the Internet.

Discussion

Our results highlighted the impact of a high social vulnerability index on the reduced performance of some healthy leisure time activities such as art, socialization and Internet use, among children and adolescents in Argentina.

A new look at the concepts of leisure time in Latin America has to be constructed, rescuing the profound knowledge and practices already elaborated in Latin American territories²⁰. However, reflection on this relationship requires various perspectives and levels of analysis. In this sense, it is necessary to highlight the influence of the public social protection policies in guaranteeing the right to leisure time in childhood and adolescence.

Some risk factors from the social sphere where biographies of children and adolescents are developed may have an impact

on the ways in which they perform in society. The fact that a significant part of the risk to their health and quality of life occurs in this context was highlighted in the field of social epidemiology²¹.

As Feito²² suggests that vulnerability has a dimension of susceptibility to harm, conditioned by intrinsic and extrinsic factors, anchored in the radical fragility of the human being, but undoubtedly largely attributable to social and environmental elements. In this sense, our study showed that a significant part of the population under analysis had some degree of social vulnerability, which makes us consider this indicator as one social determinant of health¹⁰.

Regarding the healthy use of leisure time in the population under analysis, it was observed that some activities were more prevalent than others; generally, art, sports/recreational, and socialization activities were less frequent. This information is important because, as other authors have shown^{23,24}, these activities should be proposed as strategies to promote the health of children and adolescents at social risk²⁵, since they contribute to the psychosocial and physical state of children and adolescents, while at the same time promoting life skills. This fact is relevant since they could also be the activities to be promoted through different public health policies and programs in the country.

In addition, some activities such as sports and recreation were performed only by half of the sample. This leads to the need to promote these activities in order to have a positive impact on some aspects related to the physical and mental health and nutrition of children and adolescents in a complex epidemiological context, characterized by the increase in chronic diseases, low physical activity, and malnutrition^{26,27}.

Another aspect to highlight is the high prevalence of school activities during leisure time. This can be explained by the implementation of public policies of great impact in the years prior to this survey, such as the Universal Child Allowance (AUH), in force since 2009²⁸ and considered a key element for staying at school.

In this sense, the debate on the psychosocial development in childhood and adolescence should be focused not only on school activities, but also on the possibility of choosing and performing multiple leisure time activities freely; activities that entail an enjoyment linked to them. In this sense, we agree with what Fredriksson and colleagues stated in a recent publication, in which they suggest that increasing the participation of young people in leisure activities, especially those from more socially vulnerable environments, can help to reduce social inequalities in health. In this sense, it is necessary to promote varied activities, both structured and unstructured, during free time²⁹.

Another aspect to consider is that of gender differences in the performance of activities during leisure time. For example, it is observed that "sexual division in the activities between men and women is already established in childhood and adolescence"³⁰. Our results showed that men tended to do more sports activities and women more art activities.

Table 5. Multi-level analysis of the risk of not making healthy use of leisure time according to the Social Vulnerability Index (SVI) of children and adolescents in Argentina. Multilevel logistic regression model (n= 25,915). Module on Activities of Girls, Boys and Adolescents, Annual Urban Household Survey, 2012.

School											
SVI	Model 0		Model 1			Model 2			Model 3		
			OR	95%CI	p	OR	95%CI	p	OR	95%CI	p
Without SVI			Ref. 1			Ref. 1			Ref. 1		
Low/moderate SVI			1.069	0.936-1.220	0.326	1.170	1.028-1.331	0.018	1.165	1.022-1.328	0.023
High SVI			1.783	1.483-2.144	0.000	1.371	0.991-1.752	0.058	1.317	0.992-1.749	0.057
Variance level 2 (SE)	1.497	0.231	1.494	0.234		2.476	0.399		2.434	0.395	
ICC	0.313		0.312			0.429			0.425		
Sport/recreational											
SVI	Model 0		Model 1			Model 2			Model 3		
			OR	95%CI	p	OR	95%CI	p	OR	95%CI	p
Without SVI			Ref. 1			Ref. 1			Ref. 1		
Low/moderate SVI			0.991	0.841-1.167	0.911	0.973	0.788-1.202	0.801	0.973	0.788-1.202	0.801
High SVI			1.669	1.304-2.136	0.000	1.122	0.963-1.732	0.088	1.292	0.963-1.732	0.088
Variance level 2 (SE)	4.655	0.563	4.651	0.566		5.760	0.784		5.759	0.784	
ICC	0.586		0.586			0.636			0.636		
Art											
SVI	Model 0		Model 1			Model 2			Model 3		
			OR	95%CI	P	OR	95%CI	p	OR	95%CI	p
Without SVI			Ref. 1			Ref. 1			Ref. 1		
Low/moderate SVI			0.681	0.516-0.899	0.007	0.753	0.567-0.995	0.046	0.872	0.665-1.145	0.325
High SVI			3.499	2.958-4.138	0.000	2.510	1.983-3.178	0.000	2.232	1.602-3.109	0.000
Variance level 2 (SE)	7.466	0.770	7.354	0.771		7.306	0.828		3.123	0.839	
ICC	0.694		0.691			0.690			0.487		
Internet											
SVI	Model 0		Model 1			Model 2			Model 3		
			OR	95%CI	P	OR	95%CI	p	OR	95%CI	p
Without SVI			Ref. 1			Ref. 1			Ref. 1		
Low/moderate SVI			0.689	0.540-0.879	0.003	0.701	0.579-0.850	0.000	0.701	0.579-0.850	0.000
High SVI			19.272	5.539-67.055	0.000	21.889	7.499-63.889	0.000	21.887	7.499-63.880	0.000
Variance level 2 (SE)	0.262	0.132	11.371	3.252		18.041	5.047		18.040	5.047	
ICC	0.777		0.776			0.846			0.846		
Socialization											
SVI	Model 0		Model 1			Model 2			Model 3		
			OR	95%CI	P	OR	95%CI	P	OR	95%CI	p
Without SVI			Ref. 1			Ref. 1			Ref. 1		
Low/moderate SVI			1.082	0.964-1.216	0.180	1.056	0.971-1.149	0.205	1.056	0.971-1.149	0.205
High SVI			2.031	1.396-2.954	0.000	1.999	1.282-3.116	0.002	1.999	1.282-3.116	0.002
Variance level 2 (SE)	2.690	0.182	2.680	0.177		4.343	0.435		4.343	0.435	
ICC	0.450		0.449			0.569			0.569		

ICTs											
SVI	Model 0		Model 1			Model 2			Model 3		
			OR	95%CI	P	OR	95%CI	P	OR	95%CI	p
Without SVI			Ref. 1			Ref. 1			Ref. 1		
Low/moderate SVI			0.751	0.683-0.825	0.000	0.804	0.705-0.916	0.001	0.804	0.705-0.916	0.001
High SVI			20.510	2.793-150.61	0.003	14.171	5.127-39.175	0.000	14.171	5.126-39.175	0.000
Variance level 2 (SE)	15.251	8.901	14.922	8.531		17.930	5.982		17.930	5.982	
ICC	0.823		0.819			0.845			0.845		

OR: (odds ratio) obtained by a logistic regression model, where the dependent variable was the leisure time use activities (such as dichotomous).

p: level of statistical significance <0.05.

SE: Standard Error; **ICC:** Intraclass Correlation Coefficient.

Social Vulnerability Index (SVI) defined as: The SVI of each household where the child or adolescent is included according to the cohort categories of: Without SVI: value of 0.00/low/moderate SVI: >0.00 and ≤0.45/high SVI: >0.45.

Healthy Use of Leisure Time Activities: as a dichotomous variable (yes/no) (school, sports/recreational, art, socialization, ICT and Internet).

Region defined as: Greater Buenos Aires, Cuyo, Northeast, Northwest, Pampas, and Patagonia.

Individual variables:

Household activities of the child/adolescent defined as: activities carried out in the home in an intensive and/or non-intensive manner;

Economic activities of the child/adolescent defined as: worked in the reference week and/or worked during the last year.

Age defined as: childhood <10 years old and adolescence ≥ 10 to 19 years old according to the WHO classification.

School Attendance of the child/adolescent defined as: self-report of attending school at the time of the survey.

Health Coverage of the child/adolescent defined as: health insurance (including Comprehensive Medical Attention Program (PAMI), mutual/prepaid/emergency service). Public plans and insurance were not considered as coverage.

Child/adolescent **Knows How to Read or Write** defined as: self-reporting of not knowing how to read or write at the time of the survey.

Contextual variables:

Head of Household's Education Level defined as: incomplete elementary education (including special education), complete elementary education, incomplete high school education, complete high school education, incomplete college education, complete college education, and without schooling.

Sex of Household Head defined as: male and female.

Employment Status of the Household Head defined as: employed, unemployed, inactive, less than 10 years.

Model 0: empty model only of random intersection of the dependent variable attributable to the region.

Model 1: bivariate analysis between healthy leisure time activities and the SVI.

Model 2: individual multivariate. Model 1+ all individual variables such as child/adolescent's household activities (intensive or non-intensive) and child/adolescent's economic activities (worked in the reference week or worked during the last year) sex of the child/adolescent, age of the child/adolescent, current school attendance of the child/adolescent, health coverage of the child/adolescent, child/adolescent can read and write with random intersection.

Model 3: multivariate multilevel final model: all individual and contextual variables with random intersection.

With respect to some social determinants of health, such as literacy or school attendance, in all the activities the prevalence was found to be higher in the low and without SVI subgroups, highlighting the weight of these determinants. In this sense, the ecological study conducted by Viner *et al.* on the health of adolescents suggested that the most effective health interventions are probably those addressing structural changes, e.g. access to education³¹.

Furthermore, it should be noted that the use of digital-free time, mainly focused on the use of the Internet and ICTs, has become increasingly present in the activities of children and adolescents and has become an agent of socialization³².

However, our results show that the use of the Internet is significantly conditioned by social vulnerability. In this sense, it was observed that, in the group with the highest level of vulnerability, there is a 14 times higher risk of not using the Internet.

This is relevant and shows how the condition of vulnerability becomes a determinant barrier when accessing certain goods and services, especially if progress is to be made in reducing digital divides³³.

Our findings on the use of ICTs were similarly, albeit less strongly, reflected in the use of the Internet; that is, it was observed that there was a risk of not using ICTs in the groups with high levels of social vulnerability. It should be noted that two years before this survey, Argentina implemented the "Connecting Equality" policy³⁴, a federal broad-scope program. This is important because the effectiveness of the digital divide reduction policies, especially among the most vulnerable groups, could present certain barriers to access³⁵.

There were also marked differences with respect to art and socialization practices, where it was found that the higher the social vulnerability index, the higher the risk of not performing

these activities. However, this result highlights the importance of promoting this type of activity in children and adolescents, since, according to the evidence and based on the findings by Wald³⁶, the changes perceived as a result of participating in art workshops are closely linked to feelings of well-being, the development of personal capacities and the strengthening of group relations, which may be linked in a broad sense to the paradigm of health promotion.

Furthermore, the subjective processes of socialization in human health acquires a central role. In this line, the World Health Organization³⁷ hierarchized and gave relevance to these aspects within the concept of quality of life. Several points can be highlighted in our results and our contributions to the knowledge of the situation of leisure time use in children and adolescents.

Firstly, it was found that in 2012 there was a social inequality gap, as measured by the SVI. On this point, and going back to the theoretical framework that underpinned this proposal, it is necessary to reflect on the weakening of social networks, unfavorable economic scenarios and the differential impact of targeted social protection policies at national level³⁸.

Secondly, the negative effect of social vulnerability on some specific activities was highlighted, such as those related to art, socialization processes and access to goods and services such as the Internet. From here, it is possible to postulate that this would not be fully contributing to the achievement of the Rights of the Child⁸, which claim the free participation in cultural life and the arts⁷.

Thirdly, it was observed that, in a large part of the activities of healthy leisure time use, the presence of social vulnerability conditions its full performance; in this sense, it could be believed that these activities are hampered or compete with other activities e.g. those that are domestic and economic³⁰.

In a study carried out in Ecuador, Mexico and Peru, CEPAL and UNICEF stressed that work, both paid and unpaid, is another activity that occupies an important part of adolescents' time; this reality is not in line with the fundamental rights of this group³⁰. Thus, we face a double challenge concerning the effective right to the healthy use of leisure time. On the one hand,

the aim is to promote leisure and welfare activities for children and adolescents³⁰; sports, art, and socialization activities. On the other hand, it is necessary to consider the digital divide and access to differential goods and services, which could be considered as socialization agents³² in this group.

Another weakness of the proposal is that the research question was addressed based on the analysis of a secondary data source, so it is possible that some aspects related to the construction of the SVI were left out. However, the methodology for the construction of this index is flexible and there is not a sole theoretical frame of reference. Lastly, another limitation was the data collection date (2012), where some aspects may have been modified so far.

However, this study has many important strengths. Among them, the large sample size stands out. It allowed for multivariate analyses and adjustments by multiple confounders and the national representativeness of the sample, since the survey of the secondary database was coupled to the Annual Urban Household Survey (EAHU) by following the application of a rigorous probabilistic sampling, thus ensuring the accuracy of the data obtained and the scope of the entire urban population of the country¹⁶.

Conclusions

In conclusion, the presence of social vulnerability has an unfavorable impact on the performance of some healthy leisure time activities, such as art, socialization and use of the Internet in the group of children and adolescents in Argentina. The obtained findings lead us to highlight some strategic moves concerning the field of health social determinants where the SVI could be a useful tool to guide health promotion initiatives in the population of children and adolescents.

Data availability

The MANNyA data and documentation are available at <https://www.indec.gob.ar/bases-de-datos.asp?solapa=7>.

Grant information

The author(s) declared that no grants were involved in supporting this work.

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