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Prevalence of childhood overweight and obesity and associated factors in Peru

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ABSTRACT

Objective. *To determine the prevalence of and factors associated with childhood overweight and obesity among a cohort of children 7–8 years of age in Peru.*

Methods. *This was a cross-sectional secondary analysis of data from the Young Lives longitudinal study of childhood poverty. The sample was a cohort of 1 737 children 7–8 years of age in 2009. Prevalence of overweight and obesity was assessed using body mass index-for-age Z-scores. Logistic regression was used to determine associations with a number of individual, household, and community factors.*

Results. *Prevalences of overweight and obesity were 19.2% and 8.6%, respectively. A prevalence of 32.0% and 23.5% overweight and obesity was found among males and females, respectively. High socioeconomic status, living in Lima, having a mother who was overweight or obese, being male, and being an only child or having only one sibling were associated with being overweight and obese at this age.*

Conclusions. *This study shows a high prevalence of childhood and maternal overweight and obesity in Peru. In contrast to findings in many high-income countries, the findings in Peru indicate that children from wealthier households were more likely to be overweight or obese than those from poorer households. In addition, there is something particularly obesogenic about the Lima environment that merits further investigation, and several key issues to consider when targeting future interventions and research.*

Key words Pediatric obesity; child health; overweight, prevalence; body mass index; Peru.

Non-communicable diseases (NCDs) are the leading cause of death in the world (1). Common, preventable risk factors underlie most NCDs. Overweight and obesity are considered to be among the most important risk factors (2). Overweight and obesity are not problems confined to high-income countries; in upper-middle-income countries, more than one-half of adults are overweight and one-quarter are obese (3). NCD mortality and most NCD risk factors are higher in low-income and middle-income countries (LMICs) (4).

In Peru, an upper-middle-income country, the past 20 years have brought a clear shift in its mortality profile towards NCDs, with childhood overweight and obesity becoming a growing public health concern (5). Being overweight puts children at further risk for impaired glucose tolerance, insulin resistance and type 2 diabetes, dyslipidemia, hypertension, fatty liver disease, gallstones, and gastro-esophageal reflux, as well as psychosocial complications, such as social exclusion and depression (6). Many overweight and obese children become overweight and obese adults (7) who are at greater risk for a range of diseases (8). These negative consequences will be felt especially in countries like Peru where the health care system faces the dual burden of communicable and non-communicable diseases (9).

Genetic factors alone cannot account for the rapid rise in the obesity epidemic (10).

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In order to address this challenge and inform appropriate interventions, context-specific information is needed concerning the prevalence of overweight and obesity and its association with factors such as gender, age, physical activity, diet, sleep, socioeconomic status, community safety, and urban setting. Although there is a dearth of research on NCDs in LMICs (11), there is a particular lack of research on risk factors for childhood overweight and obesity in Peru (12, 13).

The objectives of this study were to determine the prevalence and associated factors of overweight and obesity in a pro-poor cohort of school-aged children in Peru and to determine the individual, household, and community factors associated with childhood overweight and obesity in this context.

MATERIALS AND METHODS

This was a cross-sectional analysis of data from the Peruvian cohort of the Young Lives longitudinal study conducted in 2009 (14).

Study sample and data

The Young Lives team used multistage, cluster-stratified, random sampling to select the two cohorts of children; randomization occurred at the level of the household within a cluster, as well as at sentinel site level (a district in Peru). Clusters of equal population were randomly-selected excluding districts located in the top 5% of the poverty map developed in 2000 by the *Fondo Nacional de Cooperación para el Desarrollo* (the National Fund for Development and Social Compensation (14, 15). A total of 1 737 children surveyed by Young Lives in 2009 had the complete data records required for the analysis. These children were 7–8 years of age at the time of the data collection (born in December 2000–June 2002), part of the "younger cohort" of the Young Lives sample.

Study measures and variables

Body Mass Index (BMI) Z-scores were used as the outcome measure for assessing overweight and obesity. BMI is an inexpensive and reliable method of screening for weight categories that may lead to health problems (16). The 2007 World Health Organization (WHO) international growth reference curves for children 5–19 years of age described by De Onis were used to compare children of the same age and gender (16). "Overweight (in this case including obese)" and "Obese" variables were defined as BMI-for-age Z-scores of ≥ 1 and ≥ 2, respectively. Trained fieldworkers measured the children's height and weight (17).

The Young Lives data comprises child, household, and community questionnaires. All three questionnaires used in field data collection and the available data are on the Young Lives website (www.younglives.org.uk/). The independent variables selected for analysis from the available dataset were among those shown by international peer-reviewed literature to be associated with childhood overweight and obesity. Individual demographic variables used for this analysis included gender and ethnicity. A child's ethnicity was categorized as either "Indigenous" (i.e., of Quechua, Aymara, or Amazonian descent) or "Mestizo/Non-Indigenous" (i.e., of mixed, European, or African descent). Physical activity behavior was assessed based on method of transportation to school and caregiver-reported weekly physical activity. Transportation to school was classified either as "Active" if the child went by foot or bike, or "Not active" if by motorized transport. Caregivers were asked, "During the last 7 days, on how many days was your child physically active for at least 60 minutes at one time?" The physical activity variable was dichotomized as, "Physically active for 60 minutes at a time every day of the week" or "Physically active for 60 minutes at a time less than every day of the week." Caregivers were asked, "On average, how many hours did the child sleep per night." The sleep variable was dichotomized as, "10 hours or more of sleep per night" or "Less than 10 hours of sleep per night." Sugar-sweetened beverage (SSB) consumption, as reported by caregivers, was also included.

Family characteristics included maternal overweight and obesity, education of the primary caregiver, socioeconomic status (SES), and number of siblings. Maternal BMI was calculated using weight in kilograms (kg) divided by height in meters (m) squared. BMI was categorized as "Overweight and obese" when ≥ 25kg/m^2 and "Not overweight or obese" when it was < 25kg/m^2, according to WHO recommended cut-offs (18). Maternal education was categorized into four groups according the classification methods of the Peruvian education system (19). Consumer durables (CD) index quartiles, based on the number of assets owned by the household, were used to assess SES (20). The CD index was chosen as the other components of the Young Lives' Wealth Index were biased towards urban indicators of wealth within the Peruvian context. The quartiles were created according to the CD index score: First (the poorest with a score of < 0.25); Second (0.25–0.50); Third (0.50–0.75); and Fourth (the wealthiest, with a CD score of 0.75–1.00). Source of drinking water was categorized according to the WHO/UNICEF Joint Monitoring Program for Water Supply and Sanitation guidelines (21).

Peru is composed of distinct geographic areas. The seven distinct 'regional' categories defined by the *Instituto Nacional de Estadística e Informática* (Lima, Peru; INEI) were used for the study (22). Each community was defined as being either "Urban" or "Rural" on the basis of national census data from the INEI. Child reported safety was dichotomized based on the statement, "I feel safe when I go out of the house on my own." Those that responded "Disagree" or "Disagree strongly" were classified as living in a community that they considered "Not safe." Those that responded "Strongly agree," "Agree," or "More-or-less" were classified as living in a community that they considered "Safe."

Data analysis

The study analysis was conducted using Stata®/MP11 (StataCorp LP, College Station, Texas, United States). Simple descriptive analysis was employed to calculate the unadjusted odds ratios (OR) for each independent variable. Those with a *P* value less than 0.2 were included in the multivariate model (23). Logistic regression was carried out in a forward stepwise manner using the dichotomous outcome variable of "Overweight and obese" or "Not overweight or obese," with the independent variables that were shown to have the most significant effect in bivariate analyses.

Ethics approval

Ethical approval for this study was obtained from the University of Oxford Central University Research Ethics Committee (CUREC, Oxford, United Kingdom) and the *Comité de Ética del Instituto de Investigación Nutricional* (Ethics Committee of the Institute for Nutritional Research, Lima, Peru). Collective consent was sought within communities, and written, informed consent was obtained from all caregivers or guardians.

RESULTS

Of the 1 943 children from 7–8 years of age surveyed in 2009, a total of 1 737 (89.4%) had complete data and were included in the study analysis. The sample was 50.4% (n = 875) male. A minority of children (15.9%, n = 276) were indigenous of whom 87.3% (n = 241) were of Quechua ancestry. In terms of prevalence, 27.8% (n = 483) were overweight or obese and 8.6% (n = 149) were obese.

The mean BMI-for-age Z-score was 0.5 (95% Confidence Interval [95%CI] = –4.7–4.0) with a standard deviation of 1.0. The distribution of the BMI-for-age Z-scores was shifted right, positively skewed with a value of 0.18 (P = 0.003) and was leptokurtic with a kurtosis of 4.62 (P < 0.001), indicating that the proportion of BMI Z-scores above the overweight and obesity cut-off points were higher than in a normal distribution.

Over three-quarters of caregivers reported that their child either walked or bicycled to school, although only 0.6% of those children used bicycles. Only one-third (33.1%, n = 574) of caregivers reported that their children were physically active for at least 60 minutes at a time all 7 days of the week.

With respect to child SSB consumption frequency, 56 (3.2%) of caregivers reported that their child drank SSBs "daily;" 328 (18.9%) reported they drank SSBs 2–3 times each week; and 227 (13.1%) said they never drank SSBs. Well over one-half (58.0%, n = 1 007) of all caregivers reported that their children had at least the recommended 10 hours of sleep per night for children in this age group.

The majority of mothers in the study sample (65.3%) were found to be overweight or obese. Nearly 30% (n = 516) had not completed their primary education, while just over 10% (n = 188) had completed post-secondary education. Over one-half of children (n = 910) were either an only child or had only one sibling. Nearly one-third of households (n = 551) were in the lowest SES category, while less than 5% were in the relatively wealthiest quartile (n =79). The majority of households (92.7%) had access to an "improved" source of drinking water.

Most children (72.6%, n = 1 262) lived in an urban area at the time of the 2009 survey, with over 15% (n = 274) of the cohort residing in metropolitan Lima. Overall, 37.6% (n = 653) of the cohort lived on the coast, 47.4% (n = 824) lived in the mountain area, and 15.0% (n = 260) lived in the jungle area. When asked if they feel safe when they leave their house, 38.6% (n = 663) said that they did not.

After adjusting for the range of individual, household, and community variables described, being male (odds ration [OR] = 1.69), having an overweight or obese mother (OR = 1.76), having one or no siblings (OR = 1.50), being in the wealthiest two categories (OR = 2.23 and 3.36, respectively), and living in metropolitan Lima (OR = 2.70) were found to be significantly associated with childhood overweight and obesity (Table 1). Ethnicity, transport to school, days physically active, SSB consumption, sleep, maternal education, source of drinking water, and community safety lost their significance.

DISCUSSION

The combined prevalence of 27.8% overweight and obesity found in this study is comparable to rates in other parts of Latin America. A recent systematic review found that across Latin America, national combined prevalence of overweight and obesity with the WHO 2007 classification method ranged from 18.9%–36.9% in children 5–11 years of age (24). More specifically, the prevalence of overweight and obesity in recent surveys conducted since 2009 was 33.5% in Brazil, 18.9% in Colombia, and 34.5% in Mexico (24).

We found that children in the highest socioeconomic groups were more likely to be overweight and obese. Traditionally, in LMICs the prevalence of overweight and obesity among the poorest people has been limited by the scarcity of affordable food and the high-energy demands of daily life (25). However, this paradigm is changing in many LMICs. With economic development, quantity of food is less of a limiting factor. An individual's energy balance is increasingly influenced by the quality of food available and recreational levels of energy expenditure (25). A number of studies have shown that the burden of overweight and obesity in LMICs tends to shift to groups with lower SES as the countries develop economically (26). Peru is an upper-middle-income country (27). As such, a greater prevalence of overweight and obesity among the children with a lower SES would be expected (28), as has been found among schoolchildren in Chile (29). However, a positive relationship has been found previously among schoolchildren in urban areas of Peru and Colombia and among adult populations in Peru (30–32).

As Young Lives is a pro-poor cohort, the wealthiest quartile in the study is not representative of the wealthiest quartile in Peru. Another Peruvian study showed that adults with the lowest SES had a 4-fold increased risk of having multiple cardiovascular risk factors compared to the highest SES (33). This suggests that there are other social and environmental factors that modify the relationship between SES, overweight and obesity, and the future risk for chronic diseases. Income inequality in itself has been associated with numerous negative health and psychosocial outcomes, such as lower life expectancy, higher homicide rates, and lower self-rated health (34). A study by Pickett found that income inequality was associated with increased rates of adult obesity in high-income countries (HICs) (35).

When compared to the jungle, mountains, and coast regions, Lima has the highest prevalence of childhood overweight and obesity indicating that overweight and obesity are not yet a nationally-distributed problem. This relationship is consistent with previous studies of Peruvian populations (30). There is considerable research investigating the relationship between urban environments and overweight in children and adults (36, 37). Urban diets tend to be higher in processed food, fat, animal products, and sugar compared to their rural counterparts (38). Numerous fast-food restaurants, convenience stores, and marketing of unhealthy food choices can hinder good nutrition in urban areas (39).

The contrasts between urban and rural eating patterns are more marked in

TABLE 1. Odds ratios (OR) and 95% confidence intervals (95%CI) for independent variables and child overweight and obesity in a sample of 1 737 children 7–8 years of age, Peru, 2009

Independent variable		Total No.	Overweight and obesity No.	Overweight and obesity %	Unadjusted OR for child overweight and obesity (95% CI)	Adjusted OR for child overweight and obesity (95% CI)
Gender	Female	862	203	42.0	1.00	
	Male	875	280	58.0	1.53 (1.24–1.89)[a]	1.69 (1.33–2.13)[a]
Ethnicity of the child	Mestizo/Non-Indigenous	1 461	435	90.1	1.00	
	Indigenous	276	48	9.9	0.50 (0.36–0.69)[a]	1.06 (0.72–1.57)
Transport to school	Active	1 295	322	67.5	1.00	
	Inactive	423	155	32.5	1.75 (1.38–2.21)[a]	0.94 (0.71–1.23)
Days physically active/ week	7 days/week	574	135	28.1	1.00	
	<7 days/week	1 156	346	71.9	1.39 (1.10–1.75)[b]	1.18 (0.92–1.53)
Frequency of child's SSB[d] consumption	Never	227	43	8.9	1.00	
	< Every 2 weeks	293	78	16.2	1.55 (1.02–2.37)[c]	1.20 (0.76–1.90)
	Every 2 weeks	258	72	14.9	1.66 (1.08–2.54)[c]	1.24 (0.77–1.98)
	Once/week	568	146	30.2	1.48 (1.01–2.17)[c]	0.96 (0.63–1.47)
	2–3 times/week	328	123	25.5	2.57 (1.72–3.83)[a]	1.53 (0.97–2.39)
	Daily	56	18	3.7	2.03 (1.06–3.89)[c]	1.24 (0.61–2.52)
Sleep	≥10 hours/night	1 007	255	52.8	1.00	
	<10 hours/night	730	228	47.2	1.34 (1.08–1.65)[b]	1.01 (0.80–1.28)
Maternal overweight and obesity	BMI[e] <25kg/m^2	603	116	24.0	1.00	
	BMI ≥25kg/m^2	1 134	367	76.0	2.01 (1.58–2.55)[a]	1.76 (1.35–2.29)[a]
Maternal education	Incomplete primary	516	105	21.7	1.00	1.00
	Complete primary	544	115	23.8	1.05 (0.78–1.41)	0.62 (0.44–0.87)[b]
	Complete secondary	489	179	37.1	2.26 (1.70–3.00)[a]	0.87 (0.61–1.24)
	Complete post-secondary	188	84	17.4	3.16 (2.21–4.52)[a]	1.15 (0.74–1.80)
Siblings	More than one sibling	827	169	35.0	1.00	
	One sibling or only child	910	314	65.0	2.05 (1.65–2.55)[a]	1.50 (1.17–1.93)[b]
SES[f] category	First (Poorest)	551	75	15.5	1.00	1.00
	Second	548	135	28.0	2.07 (1.52–2.83)[a]	1.33 (0.92–1.93)
	Third	559	231	47.8	4.47 (3.32–6.01)[a]	2.23 (1.50–3.32)[a]
	Fourth (Wealthiest)	79	42	8.7	7.20 (4.35–11.93)[a]	3.36 (1.82–6.21)[a]
Source of drinking water	Unimproved	126	16	3.3	1.00	
	Improved	1 607	467	96.7	2.82 (1.65–4.81)[a]	1.71 (0.96–3.05)
Area of residence	Rural jungle	92	12	2.5	0.37 (0.20–0.69)[b]	1.00
	Rural mountains	357	53	11.0	0.39 (0.28–0.53)[a]	1.06 (0.53–2.15)
	Rural coast	26	8	1.7	1.16 (0.50–2.68)	1.77 (0.60–5.19)
	Urban jungle	168	28	5.8	0.49 (0.32–0.75)[b]	0.70 (0.32–1.53)
	Urban mountains	467	106	22.0	0.70 (0.54–0.89)[b]	0.96 (0.46–1.86)
	Urban coast (excluding Metro Lima)	352	133	27.5	1.80 (1.40–2.30)[a]	1.81 (0.90–3.66)
	Metropolitan Lima	275	143	29.6	3.58 (2.74–4.66)[a]	2.70 (1.32–5.53)[b]
Community safety	Safe	1 057	257	53.9	1.00	
	Not safe	663	220	46.1	1.55 (1.25–1.92)[a]	1.21 (0.96–1.54)

Source: Prepared by the authors using unpublished, original data and analysis.

[a] $P \leq 0.05$ and >0.01.

[b] $P \leq 0.01$ and >0.001.

[c] $P \leq 0.001$.

[d] Sugar-sweetened beverages.

[e] Body mass index

[f] Socioeconomic status

LMICs because market penetration into rural areas is less common. In addition, the population of Lima expanded rapidly in 1980–1990 due to guerrilla terrorism, which disproportionately affected rural communities and resulted in rapid urban migration (40). This unplanned urbanization greatly affected the built and social environment (38). It is also likely to have affected psychosocial factors such as stress, cultural alienation, loss of self-esteem, and community support (41).

It has been estimated that parental obesity more than doubles the risk of adult obesity among both obese and non-obese children (42). The relationship between maternal and child obesity found in this study has been shown in HIC and LMIC settings (43). In Bogota, Colombia, school children were 3.5 times more likely to be overweight if their mother was obese than if her BMI was normal (31). Parents play a large role in shaping their children's physical activity, eating patterns, and dietary composition (44, 45). Weight gain in pregnancy may also contribute to this relationship. Children of women who gained an excessive amount of weight in pregnancy were more likely to be overweight (46). The Young Lives study does not have information on maternal weight gain in pregnancy, but there was a high prevalence of maternal overweight generally.

The association of male gender with overweight and obesity was also found in a 2008 study school children 7–12 years of age in metropolitan Lima (30). Recent

data for Brazil also showed that boys had a higher prevalence of obesity than girls (47). Similarly, in Mexico, a study of children 5–11 years of age based on data from the 2012 National Health Survey also showed higher levels of overweight and obesity in boys (36.9%) compared to girls (32.0%) (48). Possible reasons for the association between male gender and overweight and obesity include cultural factors such as the desire to have a "big, strong boy," pressure on young girls to be slim, and the traditional social subordination of women that can affect access to quantity and quality of food (49). There is some evidence for bias in food distribution towards male children in other Latin American countries, particularly in the context of food shortage (50). In addition, women in Latin America often face a heavy social burden, and young women may be expected to do more housework than their male counterparts, contributing to a higher level of physical activity (49).

Having one sibling or being an only child was also associated with a greater likelihood of being overweight or obese, findings consistent with those of other studies of childhood overweight in HICs (51, 52). A Canadian study found that the odds of a child being overweight decreased by approximately 11% for each additional sibling (52). Being an only child or having only one sibling may mean there is more food available in the household, since having more siblings may mean sharing among more children. There may also be an effect on physical activity since an only child or having only one sibling means fewer playmates are available. Also, parents may feel more comfortable allowing their children to play outside if they are accompanied by siblings.

Study limitations

The available data provided information on a range of important variables, but there are inherent limitations when performing secondary data analysis on an existing data set. Some important measures of interest, such as detailed junk food consumption and time spent watching television, were not available. Nutritional and environmental imbalances in utero and early postnatal life are likely to contribute to the obesity epidemic through a number of mechanisms. The more rapid and earlier an infant gains excess weight, the greater the likelihood for undesirable weight in subsequent years (53). Infants born with a lower birthweight who later develop obesity also appear to be at the highest risk for cardiovascular morbidities in the long term (54). We did not include birthweight as it was only documented in approximately two-thirds of cases in the Young Lives cohort. Of that two-thirds, the percentage of low birthweight was similar in urban and rural areas. This does not explain the difference in prevalence between urban and rural children in the Young Lives study.

Since there are large income inequalities in Peru (27), another limitation of this study is that it did not investigate the relationship between SES and overweight and obesity in the wealthiest 5%, or explore the degree to which economic inequality may lead to increased overweight and obesity among the middle class. The cohort is a pro-poor sample that intentionally excluded communities in the wealthiest 5% from its sampling procedure, e.g., districts from "wealthy" sectors of Lima. Therefore, the "richest" SES category in this sample does not represent the very wealthiest segment of the Peruvian population, merely the better-off families in the cohort. Previous analytical work has shown that the Young Lives households are very similar to the average household in Peru, even when the full spectrum of SES is included, and that the sample covers the full diversity of children. The only difference found was that Young Lives households tend to have better access to some services.

Furthermore, measures of socioeconomic status are imperfect. This present study used what was available from the existing dataset, the Young Lives' Wealth Index, which is made up of several sub-indices including Housing Quality, CD index, and Services. The CD index was chosen because other components of the Index were biased towards urban indicators of wealth within the Peruvian context. For example, data from the Living Standards Measurement Survey (20) indicate that even the wealthiest households in rural areas have less access to some services—only 54% of households in the richest rural quintile have access to piped water compared to 81% of households in the poorest urban quintile. The corresponding figures for access to sewage systems are 20% and 70%, respectively (55).

Conclusions

The implications of this study for the health care system in Peru are considerable, but the effects of obesity are likely to extend beyond health care infrastructure. Obesity could compromise economic growth due to short-term absences from work, long-term disability, and premature death (56–58). There is evidence to suggest that this problem will worsen with increasing development, unless preventive measures are taken (59). We have used data from a well-established cohort study to establish the prevalence of overweight and obesity and examine the risk factors for obesity in a sample of Peruvian children. The prevalence of overweight and obesity were 19.2% and 8.6%, respectively. In an upper-middle-income country such as Peru, this high prevalence of childhood overweight and obesity is a considerable public health concern with implications for the wellbeing of these children now and in the future.

High socioeconomic status, living in Lima, having a mother who is overweight or obese, being male, and being an only child or having only one sibling were associated with being overweight and obese at this age. By identifying associated factors, this study has highlighted some key issues to consider in relation to childhood obesity in developing countries and indicates a number of directions for further research. Nationally representative investigations of the relationships among SES, income inequality, and childhood overweight and obesity are needed to fully understand this public health concern.

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Conflict of interests. None.

Disclaimer. Authors hold sole responsibility for the views expressed in the manuscript, which may not necessarily reflect the opinion or policy of the *RPSP/PAJPH* and/or PAHO.

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RESUMEN

Prevalencia de sobrepeso y obesidad infantiles y de sus factores asociados en el Perú

Objetivo. Determinar la prevalencia de sobrepeso y obesidad infantiles y de sus factores asociados en una cohorte de niños de 7 y 8 años de edad en el Perú.

Métodos. El presente estudio es un análisis secundario, de tipo transversal, de los datos generados por el ensayo longitudinal sobre la pobreza en la niñez conocido por Vidas jóvenes. La muestra se compuso de una cohorte de 1 737 niños que tenían 7 y 8 años de edad en 2009. La prevalencia de sobrepeso y obesidad se evaluó mediante el uso de la puntuación z del índice de masa corporal para la edad. Se llevó a cabo una regresión logística con objeto de detectar posibles asociaciones con diversos factores individuales, domésticos y comunitarios.

Resultados. El sobrepeso y la obesidad mostraron prevalencias de 19,2% y 8,6%, respectivamente. Se halló una prevalencia de sobrepeso y obesidad de 32,0% y 23,5% en niños y niñas, respectivamente. Varios factores mostraron una asociación con el sobrepeso y la obesidad a esta edad: pertenecer a un estrato socioeconómico alto; vivir en Lima; tener una madre con sobrepeso u obesidad; ser de sexo masculino; y ser hijo único o tener un solo hermano o hermana.

Conclusiones. El presente estudio pone de manifiesto la alta prevalencia de obesidad materna e infantil en el Perú. Los resultados observados en este país, que contrastan con los provenientes de muchos países de ingresos altos, apuntan a una mayor propensión al exceso de peso o a la obesidad entre los niños de hogares más ricos que entre los de hogares más pobres. Además, existe algún factor especialmente obesógeno en el ambiente de Lima que debe investigarse más a fondo, así como varios factores esenciales que deberán tenerse en cuenta a la hora de determinar cómo enfocar las intervenciones e investigaciones en un futuro.

Palabras clave Obesidad; salud del niño; sobrepeso; prevalencia; índice de masa corporal; Perú.