

Overview of overweight and obesity in Latin American schools Panorama del sobrepeso y la obesidad en escolares de Latinoamérica

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Abstract. The World Health Organization (WHO) and the Pan American Health Organization (PAHO), in coordination with the world's governments, have developed different strategies to combat overweight and obesity in the school population. One of the strategies consists of the World School Health Survey, which has been applied in different countries as a way to determine, in real time, the health situation of school children between 13 and 15 years of age, and from its results to generate proposals that help prevent its appearance, and favour the promotion of healthy habits and lifestyles. In Latin America, the survey has been applied in 15 countries and, in the case of this review, the sections on nutritional status and physical activity were considered, taking into account that our region has notably increased the indicators of excess weight (33,54% n=123,361) and sedentary lifestyles (41,2% n=123,361). Notwithstanding the relevance of the surveys, it is necessary to implement policies and guidelines that impact the educational system through mechanisms that guarantee the school population an understanding of the implications of good nutrition, accompanied by regular physical activity, on well-being and quality of life.

Key words: Education, obesity, overweight, schools, Latin America

Resumen. La Organización Mundial de la Salud (OMS) y la Organización Panamericana para la Salud (OPS) en articulación con los gobiernos del mundo han desarrollado diferentes estrategias para combatir el sobrepeso y la obesidad en la población escolar. Una de las estrategias consiste en la Encuesta Mundial de Salud Escolar, la cual ha sido aplicada en diferentes países como una forma de determinar, en tiempo real, la situación de salud de los escolares entre los 13 y 15 años, y a partir de sus resultados generar propuestas que ayuden a prevenir su aparición, y favorezcan la promoción de hábitos y estilos de vida saludable. En Latinoamérica, la encuesta ha sido aplicada en 15 países y, para el caso de esta revisión, se consideraron los apartados de nivel nutricional y de actividad física, teniendo en cuenta que nuestra región ha incrementado notablemente los indicadores de exceso de peso (33,54% n=123,361) y sedentarismo (41,2% n=123,361). No obstante la pertinencia de las encuestas, se hace necesario implementar políticas y lineamientos que impacten el sistema educativo a través de mecanismos que garanticen a la población escolar un conocimiento de las implicaciones que tiene la buena alimentación, acompañada de actividad física regular sobre el bienestar y la calidad de vida.

Palabras clave: Educación, obesidad, sobrepeso, escolares, Latinoamérica.

Introduction

«A good quality education is the foundation of health and well-being» UNESCO. The Incheon declaration of 2015, issued on the World Education Forum 2030 (UNESCO, 2015), establishes that education develops competences, values, and attitudes for the population to live a healthy life, to take well-founded decision, and face problems of local and global scale.

According with this premise, school should be the ideal place for children and adolescents to acquire competences to help them build healthy habits and lifestyles. From 1995, the WHO and PAHO have started the Health-Promoting Schools (HPS) (Organización Panamericana de la Salud, 2005) with the objective to empower educational communities in the generation of strategies that will help the population acquire life skills. In 2005, with the participation of 19 countries, the first Regional Survey for Latin America was applied, with the goal of determining the state of health promotion in the population aged 3 to 20 years attending school. Within the obtained results, it was discovered that 63.6% of the surveyed population was enrolled, and that 94% of the countries are developing strategies within the HPS program, with high heterogeneity in their actions. Likewise, 100% of countries report the inclusion of health

subjects in their curriculum) (Organización Panamericana de la Salud, 2005).

Notwithstanding the found positive reports, a copy of health practices in the school environment is what is perceived. In this way, different professionals attend to a school in a sporadic fashion to administer vaccines, deworming, give prevention talks, among other things; but *schools keep having a lackluster performance as a formative institutions* (Mogollón, O & Solano, M, 2011). From there, the importance of empowering teachers that day to day are always besides their students, in the planning, execution, and follow-up of the actions aimed at teaching children and adolescents healthy habits that last a lifespan.

Therefore, it's no accident seeing how the numbers on the incidence and prevalence of noncommunicable diseases continue to grow at very early ages and remain during a whole life cycle. In 2016, childhood overweight and obesity, according to the World Health Organization – WHO (WHO, 2019), report a prevalence of more than 41 millions of children under five around the world.

For the region of the Americas (OMS/OPS, 2014), the prevalence of overweight is of 62% and 26% for obesity in the population over the age of 20, being Mexico, Chile and the US countries in which 7 out of 10 people are overweight or obese. This problem has become a mandatory topic in government's agendas due to the negative impact that generates in public health, taking into account the increase in probability of acquiring noncommunicable diseases.

This review aims to know the Latin American Panorama

in the fight to prevent overweight and obesity in children and adolescents based on the actions promoted by the regional governments and that have already been implemented into the school environment. For this purpose, the Plan of Action for the Prevention and Control of Noncommunicable Diseases- NCDs (2013-2020) (OMS, 2013), developed by the WHO (2013), and the Strategy for prevention and the control of NCDs have been taken as a reference, 2012-2025 (OMS/OPS, 2012), which have as a primary objective the reduction of morbidity, disability and premature mortality caused by NCDs, achieving a 25% decrease in premature mortality by 2025.

There are countless global studies aimed at the multidisciplinary management of overweight and obesity in all populations. However, WHO figures show a negative impact, regardless of age, on the population's state of health, as well as economic and psychological deterioration of the population who suffers from them.

In October 2017, the results of a study whose goal was to estimate global trends in Body Mass Index-BMI, ranging from low weight to obesity in children and adolescents to be compared with the trend in adults was published in *Lancet* (NCD-RisC, 2017). This study utilized a Hierarchical Bayesian Model to estimate the trend in the population born from 1975 to 2016 in 200 countries, through the analysis of 2,416 studies based on measurements of size and weight of 31.5 million children and adolescents between the ages of 5 and 19. For the global analysis, countries were grouped into 21 regions. Latin America was represented in three regions that were denominated: Central Latin America, Andean Latin America, and South Latin America.

According to the study, the prevalence of global obesity in girls increased, and went from 0.7% in 1975 to 5.6% in 2016, and in boys, it went from 0.9% to 7.8% respectively. In the same way, the prevalence of low weight in girls decreased from 9.2% in 1975 to 8.4% in 2016, and in boys from 14.8% to 12.4% in the same time period.

Among the relevant findings for the Latin American Region was an increase of 1 Kg/m² by decade in female population of Central and Andean Latin America, while, in the same region, the male population didn't show any significant changes. Furthermore, a major BMI variation in children and adolescents as opposed to adults was detected. One of the more alarming statistics is that for 2016, the average BMI in Chile was of 22-24 Kg/m², increase seen in other 10 countries of the world.

With an increase of BMI in Latin America on the rise, the 53^o Directing Council of PAHO and the 66^o Session of the Regional Committee of WHO 2014-2019 (OMS/OPS, 2014) enacted the Plan of Action for the Prevention of Obesity in Children and Adolescents, through the approach of a regional public health initiative, with the aim of stopping with a multisectoral focus the accelerated increase in the obesity epidemic in adolescence.

The action plan consisted of five strategic lines of action related to 1) Primary health care and promotion of breastfeeding and a healthy diet; 2) Improvement of environments regarding nutrition and physical activity in schools; 3) Fiscal policies and regulation of advertising, promotion and labeling of food; 4) Other multisectoral

actions, and 5) Surveillance, research and evaluation.

In the case of this review, line of action 2 is the option that best responds to the stated objective. In this way, it is important to evaluate the behavior of schools or education centers of children and adolescents towards politics. In this way, *students should have, at least: national food programs, free drinking water sources, and 30 minutes a day of physical activity with a moderate to intense level of demand that allows them to reverse the tendency of overweight and obesity.*

Unfortunately, what is socially recognized in schools is the sale of unhealthy foods, as well as the high consumption of sugary drinks accompanied by insufficient physical activity. The different local studies show how *Latin America is experiencing an accelerated grow of population who is overweight between the ages of 5 to 19, where the main problem lays in the fact that the obese behavior of the population from an early age, does not change in adulthood*. Quite the contrary, the obesogenic environment tends to strengthen over the years.

Student Population in Latin America

To obtain the approximate number of Latin American students, the data published on the web pages of different Demographic Institutes of 19 countries of the Region were analyzed. The censuses have been developed between 2005 and 2018. The population data of Cuba was obtained from the Demographic Yearbook of Cuba 2018. (Table 1)

The data shows that Latin America, in 2018, had an approximate total population of 616,744,346 inhabitants, with an average density of 74.5 inhabitants per square kilometer. The average percentage of school population between the ages of 5 and 19 is 24.76% of the total population, with Cuba being the country with the lowest percentage of reported school population, and Nicaragua and Argentina with the largest population.

According to the census data, one third of the population would be susceptible to be educated within school institutions to achieve favorable changes in their lifestyle.

Table 1.
Distribution of school-age population by country according to census data

Country	Total Population (People) 2018	Population density (People/km ²)	Population aged between 5 and 19 (% of total population according to Census)	Total population aged between 5 and 19, according to Census	Year of last population census
Argentina	44,494,502	16	43.5	17,472,245	2010
Bolivia	11,353,142	10	27.4	2,836,255	2012
Brazil	209,469,333	25	22.7	43,355,314	2010
Chile	18,729,160	25	20.43	3,763,786	2017
Colombia	49,648,685	43	24.4	10,784,948	2018
Costa Rica	4,999,441	98	25.9	1,191,669	2011
Cuba	11,338,138	103	16.5	1,881,329	2012
Ecuador	17,084,357	67	30.97	4,485,685	2010
El Salvador	6,420,744	305	34.6	1,987,463	2007
Guatemala	16,346,950	158	33.4	4,973,687	2018
Honduras	9,587,522	85	35.65	2,961,113	2013
Mexico	124,738,000	64	29.38	33,013,586	2010
Nicaragua	6,465,513	50	37.13	1,909,260	2005
Panama	4,176,873	55	28.37	966,278	2010
Paraguay	6,956,071	17	29.6	2,058,997	2018
Peru	31,989,256	25	24.59	7,682,229	2017
Dominican Republic	10,627,165	218	30.4	2,880,785	2010
Uruguay	3,449,299	20	29.8	969,210	2011
Venezuela	28,870,195	32	27.76	7,560,463	2011
TOTAL	616,744,346	74.5	24.76		

Source. Authors' elaboration based on population censuses

Global School-Based Student Health Survey

Since 2003, based on a global WHO initiative, the Encuesta Mundial de Salud Escolar (EMSE) - Global School-

Based Student Health Survey (GSHS) (World Health Organization, 2019) has been promoted- with the support from UNICEF, UNESCO, UNAIDS and the technical cooperation of the CDC-US Centers for Disease Control and Prevention. Said survey consists of a self-administered questionnaire that aims to assess risk factors and health protectors in students between the ages of 13 and 15, through the analysis of the following topics: The use of alcohol, dietary habits (nutritional status), use of drugs, hygiene, mental health, physical activity (sedentary activity), protective factors, sexual habits, use of tobacco and violence; which have served as a basis for the elaboration of guidelines and policies in each of the countries in which it has been applied.

For the particular case of the school age population of Latin American, the data obtained by the GSHS were analyzed in questions related to nutritional status, physical activity (students who declare to perform physical activity, for at least 60 minutes, with a 5-day frequency in the last week) and sedentary activity (students who acknowledge having done sedentary activities for more than 3 hours on a typical day). Students from Cuba, Nicaragua, and Venezuela weren't analyzed since they have yet to be affiliated to the Global School-Based Student Health Survey. In 2018, Panama conducted the first survey of this type and the results have not yet been reported.

Table 2.
Correlation between excess weight, physical activity and sedentary activities according to GSHS

Country	Total of Population Evaluated	Overweight Population (%)	Obese Population (%)	Excess Weight (%)	Physical Activity (%)	Sedentary Activity (%)	Year of Publication
Argentina	20,890	28.6	5.9	34.5	29.6	47.1	2012
Bolivia	3,696	22.5	4.7	27.2	23.2	24.4	2012
Brazil	16,608	23.7	7.8	31.5	20.3	59.8	2015
Chile	2,049	42.7	14.5	57.2	26.1	46.2	2013
Colombia	6,773	*	*	17.9	13.4	76.6	2017
Costa Rica	2,679	27.8	8.9	36.7	27.4	44.2	2009
Ecuador (Quito)	2,215	28.6	7.3	35.9	14.8	32.2	2007
El Salvador	1,915	28.8	9.6	38.4	20.8	34.2	2013
Guatemala	4,374	28	7.7	35.7	10.9	23.1	2015
Honduras	1,779	17.8	5.6	23.4	20.8	30	2012
Mexico	49,465	21.6	9.5	31.1	28.8	42.2	2008
Paraguay	3,149	26.4	7.4	33.8	17.4	33.5	2017
Peru	2,882	19.8	3	22.8	24	28.6	2010
Dominican Republic	1,481	32.4	12	44.4	14.7	44.9	2016
Uruguay	3,406	14.8	2.2	17	18.6	51.1	2006
TOTAL	123,361	25.96	7.57	33.54	20.72	41.2	

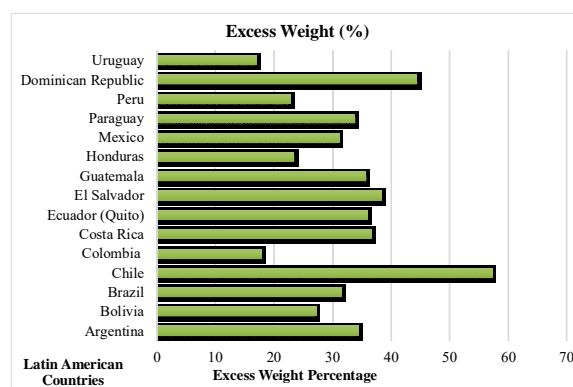
Source. Authors' elaboration based on population censuses * According to the ENSIN, the data on overweight and obesity in the Colombian population are not discriminated

According to the data from table 2, GSHS has been applied in Latin America since 2006, where it has impacted 123,361 children and adolescents. It is important to clarify that each of these countries applies the questionnaire according to their needs. This is how, in relation to nutritional status, it is evidenced that more than one third of the evaluated school population is overweight (33.54%), being the state of the Chilean students the most alarming, country in which this problem affects about 60 % of its population. Of the students from the 15 countries, 6 (40%) are above the mean, Chile and the Dominican Republic being the countries with the highest prevalence of excess weight. (Graph 1).

Excess weight (overweight + obesity)

With regards to the Chilean problematic, in 2016, the Departamento de Estadísticas e Información en Salud (DEIS, 2016), published preliminary data on the Assessment of the

Evaluation del Estado Nutricional del Adolescence, with comprehensive health control, reporting that 21.57% of students between the ages of 10 and 19 are overweight and 17.15% obese, which poses an weight excess in 38.72% of the population; although not promising, it is 18.4 % lower than the one found in the GSHS.



Graph 1. Excess Weight by Country
Source. Authors' elaboration based on data by GSHS

The history of malnutrition prevalence in Chile comes from the Encuesta Mundial de Salud in 2003 (Ministerio de Salud Chile, 2003), where it was found that 43.2% of the population older than 17 were overweight and 19.4% obese. Later, in 2004, a prevalence in obesity of 10.8% in children of 4 and 5 years and of 18.5% in 6 and 7 year-olds was reported. This, together with the international policies proposed for the fight against obesity, means that Chile has launched several strategies such as the Estrategia Global contra la Obesidad EGO-CHILE (Gobierno de Chile. Ministerio de Salud, 2006), ELIGIR VIVIR SANO (Gobierno de Chile. Ministerio de Desarrollo Social y Familia, 2011), which have aimed to promote intersectional policies and action plans, set at improving eating habits and increasing the physical activity of the population in order to reduce the prevalence of obesity.

Chile has become one of the Latin American countries championed in the implementation of policies around the control of consumption of food that lead the population to obesity. This is how, in June 2012, Law 20606 (Gobierno de Chile. Ministerio de Salud, 2015), on the Nutritional Composition of Foods and its Advertising was enacted, which entered into force in June 2016. With this Law, Chile is committed to the adoption of public health measures proposed by PAHO/WHO 2014, regarding the choice and consumption of food by the population in order to prevent the risk of acquiring NCDs.

On the other hand, the data reported by the GSHS in 2016, leaves students in the Dominican Republic in second place of excess weight among Latin American countries (see Graph 1), with the behavior in other age groups being similar. In this way, the Ministerio de Salud Pública, through la División Nacional de Prevención y Control de ECNT, launches in September 2017 the Plan Intersectorial de Prevención de la Obesidad 2017-2021 (República Dominicana. Ministerio de Salud Pública, 2017) which aims to reduce the increase in obesity in children and adolescents.

This Plan intends to have actions on the school population, promoting a healthy diet alongside with the improvement of schools environments and the promotion of

physical activity. Putting a great deal of importance in increasing the number of population that meets the requirements of weekly physical activity and reducing the time that students remain in front of any sort of screens. On the other hand, the introduction of policies that control food advertising and labeling is suggested as well.

To initiate compliance with the Plan, the amendment of 2 articles of the Ley General de Salud 42-01 was approved, which regulate the advertising warnings at the entrance of the establishments that offer fast food with the following inscription: «The consumption of processed food of high caloric content and low nutritional value, causes obesity, cardiovascular problems and diabetes».

El Salvador, Costa Rica, Ecuador and Guatemala are also above the mean in prevalence of excess weight according to the GSHS. In 2017, the Ministry of Health of El Salvador published the Plan Estratégico Nacional intersectorial para el abordaje del sobrepeso y la obesidad 2017-2021 (Gobierno El Salvador. Ministerio de Salud, 2017), oriented towards the promotion of a healthy diet and nutrition, and physical activity that incorporates all members of society.

The 1er Censo Escolar de Peso y Talla (2016) (Costa Rica. Ministerio de Salud, Ministerio de Educación Pública, 2017) performed in Costa Rica was declared of public and national interest. This evaluated the entire population between the ages of 6 and 12 belonging to the educational centers of the MEP (Ministry of Public Education) of the first to sixth grades, with a total population of 347,379 students. Among the significant data obtained from the census, it is determined that according to BMI, in 1997, 92% of the population was within normal ranges, by 2008 this range had decreased to 72%, and in 2016, only 64% of the surveyed population was within the normal range. Thus, an increase in the prevalence of obesity in both sexes has been reported since 1980. Men went from 3.6% in 1980 to 21.1% in 2016, and women went from 9.2% to 30.4% respectively. An important fact shows that the beginning of the increase in obesity data is around the age of 8, showing a slight decrease at 12. Thus, 34 out of 100 students are overweight or obese. This data places Costa Rica as the second country with the highest rate of childhood obesity in the region (ELANS, 2019).

According to official data issued by the INCAP Research Center (Instituto de Nutrición de Centroamérica y Panamá, 2019), 8.1% of children aged 1 to 4 were overweight, 11.8% of children aged 5 to 12 were overweight, and 9.6% of the same population were obese. In adolescents aged 13 to 19 years, the figure for overweight reached 23.9% and obesity 17.4%.

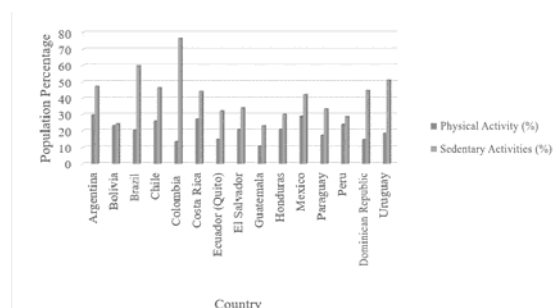
Ecuador, on their behalf, performed the Encuesta Nacional de Salud y Nutrición – ENSANUT-ECU 2011-2013 (Freire, 2013), which reports that the population aged 5 to 11 has a prevalence of overweight and obesity of 29.9%. This data is highly alarming, considering that the preschool population has a prevalence of 8.5%. The previous data indicates that the prevalence triplicates when children go from preschool to school-age. Similarly, the prevalence of overweight and obesity in the population aged 12 to 19 is of 26%. According to the analysis, in Ecuador there is a double burden of malnutrition at home; mothers who are overweight or obese coexist with children with low weight for their age. Double

burden of individual malnutrition can also find either children with a low weight or who are overweight.

The Ministerio de Salud Pública y Asistencia Social de Guatemala has conducted two health surveys in students, the first one in 2009 and the second one in 2015 (Guatemala. Minsalud, 2015). According to the data on overweight and obesity, it is evident that there are no changes between the first and the second survey or in their distribution, proving that excess of weight is more prevalent in students of private schools and females. The Plan Estratégico Nacional para la Prevención de Enfermedades no Trasmisibles 2015-2020 (Guatemala. Minsalud, 2015), has forced the government to, combined with the lack of resources, review the double burden of infectious and noncommunicable diseases. In this way, the implementation of a National Strategic Plan for the Prevention and Control of NCDs is proposed, in which, among the main risk factors, lay an unhealthy diet and physical inactivity.

Physical Activity and Sedentary Activity in Students

The inquiry aimed at knowing the percentage of students who perform physical activity according to the recommendations of the WHO (2015), shows that Argentina's school population (29.6%) has the largest population that follows the established requirements according to data from 2012, while the population with the lowest percentage of students who engage in physical activity belongs to Colombia (13.4%) according to data from ENSIN 2015 (Instituto Colombiano de Bienestar Familiar, 2019). However, in Colombia the percentage of students with excess weight is of 17.9%, which is reported as one of the lowest of the region.



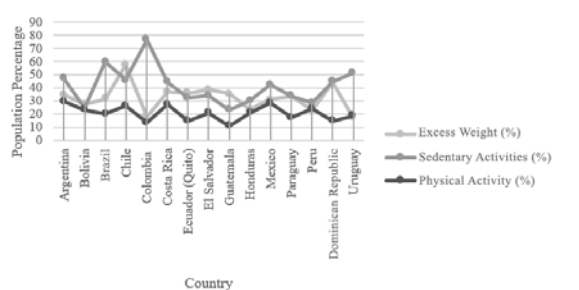
Graph 2. Physical Activity and Sedentary Activity by Country according to data from the GSHS

With regards to sedentary activities, Colombia once again occupies the first place in the percentage of students who remain inactive for more than 3 hours a day, with 76.6%, as opposed to Guatemala, where the students report a 23.1% in this type of activity.

According to Graph 2, there are significant differences between the school population that meets the requirements of physical activity and the sedentary population in countries such as Brazil, Colombia, the Dominican Republic, and Uruguay. While still recognizing that countries such as Bolivia, Peru, Honduras, and Mexico have a similar percentage of representation in both active and inactive students. Indicating that the projects being developed by the governments with regards to the promotion of healthy lifestyle habits through an adequate diet and physical activity have not had a homogeneous impact on the entirety of the

school population.

Graph 3 shows the comparison between the percentage of the population that meets the requirements of physical activity versus those who maintain sedentary activities and its result in the indicators of excess weight, which leads to generate hypotheses about the trend of behavior of school children and the figures of overweight and obesity.



Graph 3. Excess Weight, Physical Activity and Sedentary Activity by Country according to data from the GSHS. Source. Author's Elaboration

The previous behavior has been extensively analyzed in the document on Quality Physical Education published by UNESCO in 2015 (UNESCO, 2015), in which the leaders of each country are invited to promote the physical literacy of their respective population, proposal that was materialized in Modelo Sistemático del Currículo de la Educación Física de Calidad (Romero JA & Clavijo N, 2019), which proposes a transformation that starts from the definition of the policies until their development in the institutions and organizations responsible for physical education.

Conclusions

The increase in obesity in school population is a reported reality in Latin America. The change in nutritional states (excess weight above 30%) is evident, among preschool children and those who start elementary school, a situation that in perspective could be perpetuated to adulthood.

Epidemiological surveillance has led to the conduction of multiple surveys related to school health, one of them being the GSHS, which has been sponsored since 2003 by WHO/PAHO. Although not all Latin American countries have conducted it, it serves as a point of comparison between them and helps each of the governments in each country in the planning of policies and guidelines.

According to the GSHS, a third of the Latin American school-age population have excess of weight, which implies a negative impact on public health. The country with the highest percentage of compromised population is Chile, followed by 6 countries, which are above the mean, which are: the Dominican Republic, El Salvador, Costa Rica, Ecuador, and Guatemala. The countries reported with the lowest population with excess weight are Colombia and Uruguay.

The school population of Argentina and Mexico are those that, according to the GSHS, comply in greater proportion with the recommendations of physical activity given by the WHO, 20.72% being the mean for the Region. On the other hand, the average of sedentary activities performed by the school population is of 41.2%, with 7 countries above the mean, led by Colombia and Brazil.

The problems of excess weight of the Region may be

related to the low proportion of active population and the high number of population that remains inactive, requiring a lot of effort to systematically increase the performance of physical activity of the school environment and for it to extend to the family and the community (Cuadri Fernández, et al., 2017; Iglesias et al., 2019; Alvarez et al., 2020).

The reported data is not optimistic about the school health problem in the short, medium and long term in the Region. Hence, it is a responsibility of governments to propose solutions aimed not only at managing the situation, but establishing actions to prevent the emergence of overweight and obesity using the school environment as a support point as well, where children and adolescents learn and apply coadjuvant strategies, in the acquisition of healthy habits and lifestyles and engage students in moderate to vigorous physical activity (Hall-López et al., 2017; Hall-López et al., 2020; Piña Díaz, et al., 2020).

The trend for future research should be directed towards identifying the factors that will allow the structured policies and guidelines to be carried out by WHO, PAHO and the governments themselves. Through the implementation of longitudinal studies applied in the school environment that include the family. Likewise, it is suggested to optimize the studies where the professional of the physical activity and the sport in the school environment is empowered, so that it becomes the first line of identification of risk factors, in order to advance in the purpose of diminishing the indicators of excess weight of the population.

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