



Multidisciplinary education for prevention of obesity on childhood students of Mexico City

Educación multidisciplinaria en la prevención de obesidad en educandos de la Ciudad de México

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Abstract

Obesity is a public health problem, which recently affects to childhood population, impacting the health and psycho-social development of the infant, so early education aimed at promoting healthy habits represents a central axis in its prevention and control. The present work is an exercise of analysis and reflection on the efficiency of multidisciplinary and preventive programs to control obesity, based on education as a central axis. A review and analysis of studies on obesity as a social phenomenon was carried out, and analysis of studies on the application of multidisciplinary programs based on education to influence integral actions for the prevention of obesity. The prevalence of obesity has not decreased despite the strategies implemented by the health authorities. The multidisciplinary intervention programs whose principal purpose is the awareness of the childhood about how nutrition and physical activity contributes to their health care, can be an efficient means to prevent and reduce the obesity, when education is integrated into the school and family environment. "Health is a right and well-being of the infant", which can be ensured through the implementation of multidisciplinary intervention programs, based on primary care with the participation of the family and the school.

Keywords: Obesity, chronic and degenerative diseases, multidisciplinary intervention, education, health.

Resumen

La obesidad es un problema de salud pública, que afecta recientemente a la población de menor edad, impactando en la salud y desarrollo psico-social del infante, por lo que la educación temprana orientada a fomentar los hábitos saludables representa un eje central en su prevención y control. El presente trabajo es un ejercicio de análisis y reflexión sobre la eficiencia de los programas multidisciplinarios y preventivos para controlar la obesidad, basados en la educación como eje central. Se realizó una revisión y análisis de estudios que abordan el problema de la obesidad como fenómeno social, y de estudios que evalúan la aplicación de programas multidisciplinarios basados en la educación para incidir en acciones integrales de prevención de la obesidad. La prevalencia de obesidad no ha disminuido pese a las estrategias implementadas por las instancias de salud. Los programas multidisciplinarios de intervención cuyo tema central es la concientización de los educandos sobre cómo contribuye la nutrición y la actividad física en el cuidado de su salud, pueden ser un medio eficiente para prevenir y disminuir la obesidad infantil, cuando se integra la educación en el ámbito escolar y familiar. "La salud es un derecho y bien tutelar del infante", que puede asegurarse a través de la implementación de programas de intervención multidisciplinaria, sustentados en los cuidados primarios con participación de la familia y la escuela.

Descriptores: Sobrepeso, obesidad, enfermedad crónico-degenerativa, intervención multidisciplinaria, educación, salud.

1. Introduction

The prevalence of overweight and obesity has almost doubled from 1980 to 2014, becoming a problem with epidemiological dimensions. According to the World Health Organization (WHO), more than 1.9 billion of adults over 18 years old are overweight and more than 600 million are obese worldwide (World Health Organization, 2016).

At present, in Mexico, the problem of overweight and obesity in childhood has reached alarming levels. According to the report of the National Health and Nutrition Survey (ENSANUT, 2016), the combined prevalence of overweight and obesity in children from 5 to 11 years old is 33.2%, which is higher in urban regions than in rural areas (34.9% vs. 29.0%). In Mexico City the epidemiological problem is one of the most alarming because there are especially high numbers of overweight and obesity (OWandO) 32.9% (15.9% overweight and 17.0% obesity). The excessive increase of this condition is manifested in its impact on the increase of chronic-degenerative diseases, pathologies associated with obesity such as: metabolic syndrome, hypertension, dyslipidemia and hyperglycemia, which increase the risk of cardiovascular disease and type 2 diabetes, whose complications are currently linked to the main causes of death in the population (Instituto Nacional de Estadística y Geografía, 2015; World Health Organization, 2015 and 2017).

To prevent and reduce the prevalence and incidence of OWandO in order to ensure an adequate state of health in children, there is a need to develop programs that promote healthy environments where multidisciplinary collaboration between different social actors is essential, the jointly participation of various bodies (family, public and health sector, private sector, education sector, society and international bodies), would be intended to influence comprehensive proposals and actions aimed at changing eating habits and patterns that inhibit physical activity in children.

On the other hand, the consequences of the different risk factors in the development of OWandO have been widely described; thus, the evidence suggests that most interventions are oriented towards changing these key lifestyle factors with different approaches and levels (Brown & Summerbell, 2008), whose theoretical foundations are generally based on the planning and implementation of collective and individual intervention programs aimed at achieving social or behavioral learning. The purpose of this study is to analyze the importance of early education in the health area in reducing or preventing OWandO in children, to analyze a series of studies derived from the implementation of multidisciplinary intervention programs based on teaching the healthy habits and health care of children in order to discuss their efficiency and their usefulness to find a solution for this condition.

2. Material and methods

A review and analysis of studies addressing the problem of obesity as a social phenomenon was carried out as well the importance of education in addressing this public health problem, in order to remark the relevance of education-based intervention programs as a strategy to generate multidisciplinary programs that affect comprehensive actions to prevent and/or treat obesity.

3. Analysis of the problema

3.1. Relationship between overweight, obesity and education

In general terms OWandO are defined as “an excessive accumulation of body fat” (World Health Organization, 2016), established as a result of a loss of energy balance between spending and consumption. From the etiological point of view, obesity is considered a multifactorial condition; however, the decrease in physical activity and diet, characterized by high-calorie



diets derived especially from the consumption of fats and carbohydrates, have been the causes that seem to contribute more significantly to obesity (World Health Organization, 2016).

The etiology of OWandO can also be addressed from the evolutionary point of view (Wells, 2012). In this sense, it is clear that living organisms control or regulate their physiological processes according to the stimuli perceived by the environment, which allow them to maintain physical stability, enabling growth and development, reproduction, among other factors. Such response mechanisms make it possible to survive in a stable way, or from the physiological perspective to maintain homeostasis (Wells, 2012; Serlie, La Fleur & Fliers, 2011). In this sense, the environment in which the human is today (obesigenic environment), is decisive for the development of the diseases that affect him/her (Serlie *et al.*, 2011). Currently, the environmental factors that influence the individual and that enhance the development of OWandO have been addressed by different specialists, thus considering the social, cultural, economic, political factors, etc., therefore, overweight and obesity become a complex problem that hinders its prevention and treatment from a single approach. In the social and cultural factors that favor the development of obesity, “education” has a main role that has been based on different population studies (Andrade & López-Ortega, 2017; Hoffmann *et al.*, 2017; Ferguson *et al.*, 2017; Non, Gravlee & Mulligan, 2012; Singh-Manoux *et al.*, 2009), not only because it gives the individual the ability to develop fully (cognitive and physical development), but because through education the individual acquires the ability to understand, analyze and discern what is appropriate to maintain eating and nutritional habits that ensure a better health. In simplified terms and as an example, history shows how in the old days the transmission of empirical knowledge had great relevance in the early settlers, in the sense that children and young people were educated by adults about the potential environ-

mental risks that could jeopardize the integrity of individuals. Thus, it can be said that education is the correct way. This role is attributed to “education” by involving the pedagogical action that is exercised on someone else, with the purpose of instilling knowledge, beliefs, values, generating experiences, as well as preparing them for life.

In this regard, León (2007) proposes that education seeks the perfection and security of the human being who is guided and transformed by education and by himself/herself, for education is in its civilizing essence, producing benefits. This reasoning on education to which psychology, pedagogy, sociology of education have contributed so much is also useful in this thoughtful work, in which it is argued that ‘educating for the health is educating for a full life’.

Hence, the importance of “health education from the earliest stages of life” is emphasized, leading to the acquisition of healthy habits and knowledge of body care. This allows school-aged children to have a broad knowledge of their body and the environment around them, providing tools that make them capable of becoming aware and distinguishing between good or bad things for their health and physical integrity; moreover, it can give the students the ability to pass on learning from generation to generation, especially when taking into account that OWandO “have physical and psychological consequences for the health during childhood, adolescence and adulthood, in addition to the social, economic and health consequences” (World Health Organization, 2016).

At present, some educational intervention programs aim to strengthen individuals by fostering relevant and appropriate learning in the health, in order to “transform the environment and obesigenic social patterns” (World Health Organization, 2016, p. 11). Individuals are expected to be able to recognize the environment, risk factors and anti-obesigenic, and to be aware of the benefits of acquiring good health habits (food, physical activity, good sleep, etc.), as well as the health risks involved in lacking



them. However, the implementation of appropriate preventive programs has been a major challenge at the national level, because it requires the attention of a multifactorial problem that must be addressed in the same way, i.e., from a multidisciplinary approach, and it must consider the inclusion, interaction and participation

of various actors (family, school authorities, advertising, industry, government, health bodies). As the WHO indicates “without a common vision of the problem and shared responsibility, well-meaning and cost-effective interventions have limited impact and light upon” (World Health Organization, 2016, p. 7).

Figure 1. Social and co-responsible agents for the OWandO problem



On the other hand, the Mexican Institute for Competitiveness (IMCO, 2017), indicates the need to have a comprehensive view of the problem and the actions to be undertaken, which requires multisectoral and multi-government support. Figure 1 shows the co-responsible social actors for the reduction and prevention of OWandO.

From a philosophical point of view, when Edgar Morín conceived the human as *Homo*

complexus, it allows to understand the different perspectives of the problems presented and the actions provided by the human. According to León (2007), education is a complex human and cultural process, and it is necessary to consider the condition and nature of the man and the culture as a whole, in its entirety, to establish its purpose and definition, so each particularity makes sense for its bonding and interdepend-



ence with others and with the whole. In this sense and according to César Coll in an interview carried out (Rigo-Lemini, Díaz-Barriga-Arce & Hernández Rojas, 2005), it is very clear that the educational processes are very complex — in which there are numerous variables and factors—requiring a multidisciplinary look (Gibbons, 1998; Morin, 1999).

However, some reports that have highlighted the importance of the relationship between poverty, obesity and education attribute a direct relationship to it (Ortiz-Hernández; Pérez-Salgado & Tamez-González, 2015). In other words, the lack of education influences people's poverty level, and it directly influences the prevalence of OWandO; however, it can also be interpreted as a vicious circle, since poverty may be one of the causes of low or no educational level by not having the minimum conditions of existence, resulting in ignorance of risk factors in food, malnutrition, or giving way to beliefs that are part of their value system, such as believing that “the fatter the child, the healthier he is”. Hence, the lowest social sectors are placed at a higher level of vulnerability, affecting people's quality of life and becoming a problem that reaches alarming levels in many nations, while the OWandO have become a very serious epidemiological and social condition, especially since “... they can nullify many of the health benefits that have contributed to the improvement of life expectancy” (World Health Organization, 2016, p. VI). In this regard, several studies agree with the fact that the population with the lowest economic resources and with low access to education has the highest figures of OWandO; in this sense, WHO emphasizes that “... in absolute numbers, there are more children with OWandO in low- and middle-income countries than in high-income countries” (World Health Organization, 2016, p. VI).

In addition to the above, the latest results reported by the National Institute of Public Health, derived from ENSANUT 2016, reflect the lack of information and knowledge on the fac-

tors that enhance the development of OWandO in the need to address this problem by providing information and generating knowledge about the factors that influences opbesigenic patterns, as well as in promoting health education from an early stage. In relation to the above, ENSANUT applied a series of questionnaires to the Mexican population to investigate their perception of obesity, eating behavior and physical activity; the findings of the survey indicate that the population knows that: high consumption of sweet beverages is harmful to the health (92.3%); b) that these cause the development of obesity (92.2%), c) cause tooth decay (93.4%), d) cause high blood pressure (86.2%) and e) cause diabetes (93%). However, f) most of the people like to consume them (81.6%), which may suggest that their knowledge about the consumption of these products is not enough to raise awareness of health harm on at least one time scale, because these conditions are usually established in the long term and can be asymptomatic at an early stage. On the other hand, a high percentage of the population responds that g) lack of knowledge contributes to not buying healthy foods (38.4%) (ENSANUT, 2016).

Other results of the survey show that lack of education leads to ignorance of the analysis derived from the reading and interpretation of food labelling. With regard to this, it was found that h) less than half of the population reads the nutrition labelling of the products it consumes (40.6%), in addition (i) the vast majority of the population reports that it does not fully understand the label information (83.4%), and that, j) only 19% of the population reviews the packaging or information indicating whether or not the food is healthy. Additionally, k) a high percentage of the population does not know how many daily calories they should consume (76.3%).

On the other hand, despite the intervention programs that have been promoted at the national level, such as the campaign “CHECK, MOVE and MEASURE” that involves different health areas, there is a lack of information that



promotes its implementation, and there is little understanding of the objectives of the campaign as they appear to be poorly taken care of. In this sense, only a little more than half of the population (57.4%) and 61.4% in the urban area, knows the campaign and its objective:

Check = to attend your health clinic.

Measure = reduce dampening fat, sugar and salt, as well as performing anthropometric assessments that suggest some cardiovascular risk.

Move = to exercise daily.

It can also be considered as part of the findings of the survey applied by ENSANUT (2016) to the target population, that only 6 out of 10 Mexicans really know the main purpose of the program which is to modify obesigenic habits and promote a healthy lifestyle.

The above data show the urgent need to work comprehensively on this health problem, addressing it from its complexity as a condition that requires multidisciplinary care.

While obesity, a chronic, complex and multifactorial disease, is also likely to be preventable by encouraging transitional changes in eating patterns and physical activity during childhood, it suggests a preventive action based on education to acquire a clear awareness of the benefits to maintain healthy habits as a lifestyle, considering the concept of health in a broader sense, where "... in addition to being an educational co-agent, essential in the evolutionary development of the child, the new conception of health should be considered as a complete state of physical, psychic and social well-being". This entails a new orientation, not only of the treatment of diseases, but of the promotion of healthy environments where collaboration between social agents and

multidisciplinary perspectives is vital (Cámara de Diputados LXIII Legislatura, 2017).

In this sense, it is believed that the multidisciplinary conception can contribute to the prevention and primary detection of OWandO in children, through intervention proposals that promote healthy nutritional habits by remarking the importance of having a diet, performing physical activities and having a good health care.

3.2. Types of multidisciplinary interventions

Generating a classification for the different types of multidisciplinary interventions is complicated due to their heterogeneity, either because of the number of components it considers, the predominant learning approach and the inclusion of different actors, or the context in which it develops. In this sense, a first approach to classify multidisciplinary interventions for the prevention of child's OWandO may be given from the level of prevention: a) those aimed at promoting healthy lifestyles in primary health care, b) primary care focused on specific behaviors for the weight management and control or prevention (c) those that go beyond the objective of adequate nutrition and the practice of physical activity at a third level of care (Fitch *et al.*, 2013).

On the other hand, there are interventions oriented to a single factor or multifactor according to the number of elements to consider, guided for specific purposes, which range from educational aspects in nutritional topics, the promotion of physical activity for the reduction of sedentary lifestyles, and the promotion of habits or behaviors aimed at improving an eating behavior.



Table 1. Main topics and purpose in a systematic and multidisciplinary intervention for the prevention of childhood overweight and obesity

Topic	Purpose
Nutritional	<ul style="list-style-type: none"> • Increase the consumption of fruits and vegetables • Encourage the consumption of water • Limit the consumption of sweet drinks • Promote the consumption of breakfast • Limit the intake of food outside home • Recommend family meals or involving those responsible for the children • Consider the size of portions suitable for children • Promote the consumption of milk and dairy products • Promote a high-fiber diet • Avoid doing other activities while eating • Plan meals in advance • Eat slowly and in set times, do not skip meals
Physical Activity	<ul style="list-style-type: none"> • Get involved in moderate to vigorous physical activities at least 60 minutes a day • Identify limitations to physical activity • Perform physical activities outside of school hours, according to the individual's age and preference
Sedentarism	<ul style="list-style-type: none"> • Evaluate the family environment to identify factors that can contribute to obesity • Reduce screen time (TV, video games, tablets, mobile phones, mobile devices) • Avoid long periods of physical inactivity
Behavior	<ul style="list-style-type: none"> • Identify key behaviors as an opportunity to improve lifestyle • Promote self-efficacy and self-sufficiency skills in children
Psychological	<ul style="list-style-type: none"> • Identify moods or risky behaviors related to a food overintake

Source: Own elaboration based on (Fitch *et al.*, 2013, Perea-Martínez *et al.*, 2014).

As the recommendations seek to improve food behaviour through public health policies, programs and systematic and multidisciplinary intervention actions, it is important to note that these are difficult to achieve without appropriate support from different stakeholders and social agents (Elizondo & Serrano, 2010) as mentioned above; hence, suggesting another classification according to the levels of action or context of its implementation, there are those that focus on: (i) the modification of the food service or specific outlets, (ii) individual interventions, (iii) interventions aimed at changing school environments and surrounding areas, (iv) those involving the family environment, and finally (v) intervention proposals generated to impact at community level (Ganann *et al.*, 2014). The

above means that intervention strategies should be promoted jointly and not isolated to enhance their effects, which means that better results can be achieved through synergy (cooperation), integrality, systematization, since as Pérez-Mendoza stated (2011), a social impact is intended to be achieved. It is about changing perspectives and creating a virtuous circle in the prevention of OWandO in children, as illustrated in Figure 2.

While schools have been the ideal vehicle for implementing educational strategies aimed at promoting healthy lifestyles; it has been generally observed in the nutrition and physical activity binomial that those with a duration longer than one year aimed at promoting physical exercise are moderately effective in preventing OWandO while the intervention lasts (Barrera-Cruz *et al.*, 2013).



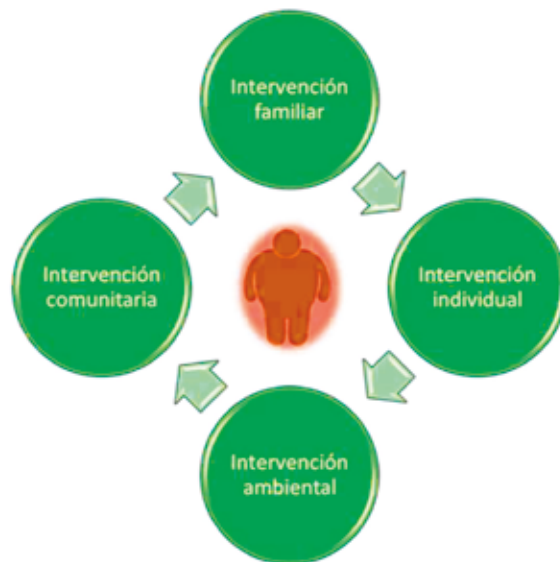
In addition, family interventions seeking to change diet and increase the practice of physical activity are effective in preventing the gain of body fat, at least for the duration of the program; in this regard, the experiences and studies carried out by experts on the subject reveal that a period of 2 to 5 years is key to establishing good nutritional habits, especially when parents actively participate (Barrera-Cruz *et al.*, 2013).

With regard to community interventions, it has been suggested that these represent a promising option to impact a big number of people by encouraging barriers and creating opportunities for the adoption and reaffirmation of healthy lifestyles. These types of programs have been successful once community members recognize and commit to the need for such strategies, as well as providing feedback on identifying barriers and improvements to their implementation. In this sense, education is essential to provide information and tools appropriate to the social context (Registered Nurses's Association of Ontario, 2014).

It has recently been suggested to implement environmental interventions, which rarely change socio-cultural aspects of the community, as they are independent of the environment and include physical, chemical and biological factors external to the person and their behaviour (Prüs-Üstün & Corvalán, 2006), so its effect on the prevention of childhood obesity is unclear.

On the other hand, primary prevention interventions may consider different techniques for the modification of the behavior, highlighting the use of tools that promote family commitment and individual work simultaneously during periods of no less than 6 months, in which useful information regarding the relationship between behaviour and health will be provided, as well as promoting the practice of healthy habits. Some others suggest that the effectiveness of these interventions lies in the basis of social learning or environmental change, which may have differential results among boys and girls, according to their cognitive and psychosocial development (Registered Nurses's Association of Ontario, 2014).

Figure 2. Virtuous circle with intervention programs to prevent and decrease the prevalence of overweight and obesity in childhood



Source: Own elaboration



Conclusions

The problem OWandO is alarming and it negatively affects the population in different aspects, so it has been suggested as a public health priority. The complexity of developing successful programs for the care and prevention stems from multifactorial reasons, so the approach should be integral, taking into account that the success of any strategy lies in the ability to adopt and maintain lifestyle behaviors that contribute at different levels to modify and improve factors at the intrapersonal, community, organizational, governmental and public levels.

When developing strategies for the promotion of healthy lifestyles aimed at the primary and secondary prevention of childhood obesity, it is recommended that these can be universally applied, taking into account certain contexts, as well as focusing on modifying various behaviors through different strategies that allow information, learning and new knowledge to cover a larger extend of population at different educational and socio-economic levels.

Intervention studies for the treatment and/or prevention of OWandO have yielded results with little impact so far, due to the same diversity of factors that need to be addressed. While the programs know the areas require influence, the participation of the educational field becomes a priority, on which an adequate transfer of health care knowledge from an early age of the individual's development depends on education according to the ages and context of each student. In this regard, it is essential to take this transfer of knowledge and inquiries on the subject of OWandO to multidisciplinary practice, with the aim of focusing that research in certain areas of life, such as health, education, public policy, human rights, or whatever with deep implications in the social and pedagogical practices. If this perspective is broaden, there will be many spaces from which pedagogical actions can be carried out for the benefit of children and their future. The planning of multidisciplinary

intervention proposals is an opportunity to influence the well-being and good living of children, especially in areas where the preventive level is necessary. On another level, it would be with a solution for those who are already obese, since this tool would induce changes in their lifestyles, beliefs, eating and nutritional habits, becoming aware and reinforcing the premise that "educating for health is educating for life" and it would help improving their quality of life and that of their environment.

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