Prevention of overweight and obesity from a public health perspective

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International organizations have raised awareness of the increasing prevalence of overweight and obesity worldwide and the impact on morbidity, mortality, quality of life, and cost of healthcare. The development and implementation of obesity prevention strategies requires the identification and understanding of determinant factors that can be influenced by effective large-scale action plans over time. Strategies aimed at the primary prevention of obesity in a population should be multifaceted and designed to actively involve stakeholders and other major parties concerned; in addition, multiple settings for implementation should be considered. In this paper, an overview is presented of the strategies currently in place for obesity prevention, particularly in Spain.

INTRODUCTION

In recent years and in many countries, public health strategies and improvements in treatment technologies have led to decreased mortality caused by cardiovascular disease.[1] This trend, however, could be reversed unless increasing rates of obesity are counteracted. The World Health Organization (WHO) and other international bodies have drawn attention to this issue and have developed global strategies to address various aspects of the detection, adequate treatment, and prevention of obesity.[2,3,4,5] Accordingly, the Spanish Ministry of Health and Consumer Affairs launched the National Strategy for Nutrition, Physical Activity and Obesity Prevention (NAOS), which outlines different levels of action; one of these is the PERSEO program, a school-based intervention aimed at fostering healthier eating practices and physical activity among Spanish schoolchildren.[6]

Obesity prevention must begin in the early stages of life. It is of utmost importance to ensure adequate nutritional status during pregnancy for the health of the mother and the future newborn. Primary prevention of obesity requires population-wide approaches with the aim of promoting healthier eating practices and an active lifestyle. In addition, this level of prevention includes the early detection of overweight people.[7,8,9]

At the community level, obesity prevention should be based on nutrition education and the enhancement of physical activity in different settings, such as schools and workplaces, and should enlist the involvement of families as well. The support of governmental administrations, the mass media, catering services, and the food industry is crucial in order to achieve and sustain environmental changes, so that healthier options are also easy options.[10]

OVERWEIGHT AND OBESITY: AN ISSUE FOR PUBLIC HEALTH

The International Obesity Task Force (IOTF) and the WHO have raised awareness of the magnitude of obesity and its impact on morbidity and mortality, quality of life, and cost of healthcare.[11] A WHO report on diet and health recognizes the impact of obesity on the

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development of some of the most widespread chronic diseases, namely, type 2 diabetes, cardiovascular disease, skeletal-muscle pathology, and several types of cancer.[12]

The problem is not restricted to industrialized societies: obesity rates are increasing in urban areas of developing countries, particularly those in transition. Of special concern are the increasing numbers of overweight children and adolescents in many countries.[13]

Table 1 shows the top five countries with the highest rates of obesity prevalence in each WHO region, according to data compiled by the IOTF.[14] Overall, the highest estimates of obesity prevalence in adults can be found in Nauru in the WHO South-East Asian Region (80% in men and 78% in women), followed by Lebanon in the Eastern Mediterranean Region (36% in men and 38% in women), the United States in the North American Region (31% in men and 33% in women), Croatia in the European Region (31% in men and 15% in women), and Panama in the South American Region (28% in men and 36% in women). In contrast, the lowest prevalence rates are found in the African Region, where the highest rates are seen in South Africa (10%) and Seychelles (9%). However, even countries such as Ghana show a prevalence of 20% among women. The estimated prevalence in the Spanish adult population aged 25–60 years is 15.5% (13.2% in men and 17.5% in women).[15]

Regarding younger age groups, the same source reports the highest estimates of overweight and obesity in preadolescent European boys (approximate age, 7–11 years) in Spain,[16] Malta, and Portugal; in older children aged 14–17 years, rates were highest in Cyprus, Spain, and the United Kingdom.[14]

Among European girls, the highest estimates were found in Portugal, Greece, and Italy for the group aged 7–11 years and in the United Kingdom, Ireland, Hungary, and Italy for the group aged 14–17 years.

Despite the fact that causal pathways are not clearly elucidated, there is a body of evidence regarding determinant factors for obesity.[9,11,12,17,18,19] Research shows a differential prevalence of obesity by age, gender, and socioeconomic position, with higher prevalence rates found in less-favored social groups. Individuals with overweight parents are more likely to be overweight. Multiple genetic factors are likely to explain the variation of the adiposity phenotype in populations.[17]

Major environmental and lifestyle changes related to diet and physical activity (or inactivity) patterns in early life have been implicated in the increasing trends of overweight.[18] An obesogenic environment is probably the primary cause of the recent trends in obesity and its associated inequalities.[19]

Challenges in obesity epidemiology include the consequences of long-term excess weight, which are still unclear. There is conflicting evidence about the nature and strength of the association between body mass index (BMI) and mortality, as well as between BMI and rates of cardiovascular disease or events. There is an association between childhood and parental obesity, but it is unclear whether this is an epigenetic phenomenon or simply an indication of a family environment and lifestyle that leads to a positive energy balance. Diet and physical activity are interdependent and are both affected by influences beyond the individual.[20]

PREVENTION OF OVERWEIGHT AND OBESITY: A POPULATION-BASED APPROACH

The development and implementation of obesity prevention strategies requires the identification and understanding of determinant factors, particularly the environmental factors that can be influenced when addressed by effective action plans carried out on a large scale over time.

Effective weight management for individuals and groups at risk of developing obesity involves a variety of long-term strategies: prevention, weight maintenance, management of comorbidities, and weight loss. These strategies should be part of an integrated, multisectoral, population-based approach that includes environmental support for a healthy diet and regular physical activity.[9,10]

Different organizations have developed evidence-based clinical guidelines for the early identification and adequate management of overweight and obese individuals. Protocols for secondary prevention have been developed as well.[3,4,5]

Population-based strategies aimed at the primary prevention of obesity should be multifaceted and designed to actively involve stakeholders and other major concerned parties; in addition, multiple settings for implementation should be considered. They should promote healthy eating practices, including a diet with adequate amounts of fruits and vegetables, as well as habitual physical activity and a reduction in sedentary behaviors in order to avoid weight gain and maintain a healthy body weight.[21]

The food industry has responded to changing consumer needs and demands. Some of the strategies that have emerged include modifications in food composition to make products that are lower in caloric density or rich in fiber. Functional foods with components such as conjugated linoleic acid, claimed to be a weight loss aid, have also been developed.[22]

School and worksite settings provide ample opportunities for nutrition and physical activity interventions, including environmental and policy changes to foster healthier eating practices and physical activity as well as to open communication channels. Existing evidence on the effectiveness of interventions to control overweight

Table 1 **Top five countries, according to each WHO region, with the highest rates of obesity prevalence in men and women.**

Country	Year of data collection	Age category	Males		Females	
			Overweight	Obesity	Overweight	Obesity
			Percent with BMI 25–29.9	Percent with BMI 30+	Percent with BMI 25–29.9	Percent with BMI 30+
South-East Asian & Pacific region						
Nauru	1994	25+		79.3		77.9
Tonga*	1998–2000	15–85	37.4	46.6	22.7	70.3
Cook Island	1998	n/a	36.0	40.6		
French Polynesia	1995	16+	38.9	36.3	28.2	44.3
Samoa	1995	29+		32.9		63.0
Eastern Mediterranean region						
Lebanon	1998–2002	25–64		36.3		38.3
Qatar	2003	25–65	34.3	34.6	33.0	45.3
Jordan (urban)	1994–1996	25+		32.7		59.8
Kuwait	1998–2000	n/a	38.3	27.5	32.8	29.9
Saudi Arabia	1995–2000	30+	42.4	26.4	31.8	44.0
North American region						
USA	2003–2004	20+	39.7	31.1	28.6	33.2
Mexico	2000	20–69	41.3	19.4	36.2	29.0
Canada	2004	18+	42.0	22.9	30.2	23.2
Guyana	2000	20+	26.0	14.3	30.7	26.9
Bahamas	1988–1989	15–64	29.1	13.9	25.6	28.0
European region						
Croatia	1995–1997	18–65	48.1	31.1	34.7	15.2
Cyprus	1999–2000	25–64	46.0	26.6	34.3	23.7
Czech Republic	1997–1998	25+	48.5	24.7	31.4	26.2
Albania (urban)	2001	25+	56.5	22.8	42.2	35.6
United Kingdom	2005	16+	43.4	23.1	32.1	24.3
Spain	1990–2000	25–60	45.0	13.4	32.2	15.8
South American region						
Panama	2000	15–93	30.9	27.9	33.4	36.1
Paraguay	1991–1992	20–74	41.6	22.9	36.1	35.7
Argentina (urban)	2003	18–65	24.6	19.5	10.8	17.5
Uruguay (urban)†	1998	18+	40.0	17.0	30.0	18.0
Dominican Republic	1996–1998	18–74		16.4		18.3
African region						
Seychelles	1994	25–64	29.8	8.5	31.6	28.2
South Africa	1998	15+	21.1	10.1	25.9	27.9
Cameroon (urban)	2000	15+		5.1		13.8
Ghana	1997	25+	17.1	4.6	26.9	20.2
Tanzania (urban)	1998	25–64		4.5		10.0

* IOTF estimate.

† Self-reported data.

Elaborated from data of the International Obesity Task Force (2007).[14]

support the recommendation for worksite interventions that promote a combination of healthy diet and physical activity by means of the following: 1) nutrition education, 2) instruction in aerobic exercise or strength training, 3) training in behavior-modification techniques, and 4) provision of self-directed materials, specific dietary recommendations, and group or supervised exercise.[23]

Primary healthcare practitioners see large numbers of patients on a regular basis and often have established long-lasting relationships with these individuals. The development and implementation of guidelines for the early detection of overweight individuals and obesity-related comorbidities is essential. Additionally, primary healthcare practitioners may be influential in changing patients' behaviors. However, the lack of time, the lack of interest on the part of patients, the lack of knowledge about physical activity and dietary change, and the lack of training in the area of behavioral counseling are important barriers to overcome, despite numerous examples of interventions proven to be feasible in primary-care settings.[24]

Obesity is a complex problem, and policy measures to modify the social environment are required to support changes that will contribute to increased access to healthy choices. In order for strategies to be effective, it is essential to gain the participation and commitment of key stakeholders.

PREVENTION OF OVERWEIGHT AND OBESITY IN CHILDHOOD

There are a number of epidemiological considerations under debate in relation to the definition of overweight and obesity in children, such as which indicators to apply, which cutoff levels to use for measuring change over time within countries, and which reference tables are adequate.[25]

Literature reviews have shown that only a few intervention studies analyzed the potentially unhealthy outcomes of the interventions employed, such as the impact on underweight or overweight participants.[26,27] Primary prevention interventions should be targeted to modify obesity-related behaviors without contributing to weight loss in other healthy children.

Ethical considerations in obesity prevention are challenging as well, particularly regarding children. An approach that targets high-risk populations can be cost effective, but it poses the risk of stigmatizing individuals identified to be at high risk and therefore invited to be part of the intervention. Moreover, population-based approaches can tend to be highly paternalistic by singling out the right choices for people.[28] However, population-based approaches oriented toward making the healthy choices easy and accessible do not interfere with individual freedom of choice; such approaches can protect those in need and help bridge the gaps of inequalities in health.

Literature reviews on the effectiveness of obesity prevention interventions suggest that those more likely to be successful include changes in dietary behavior, a reduction in time spent in sedentary activities, and an increase in the time devoted to physical activity; in particular, strategies to reduce sedentarism have been found effective.[27] Systematic reviews that addressed the environmental determinants of obesity-related dietary behaviors concluded that the family environment, including parental intake of fat and soft drinks, parental intake of fruits and vegetables, modeling behaviors, parenting styles, parental educational level, and the availability of and access to fruits and vegetables at home, are relevant factors influencing child and adolescent eating practices.[29]

Early literature reviews on the effectiveness of school-based nutrition education programs identified educational strategies that were behaviorally focused and theory driven as being conducive to successful programs.[30] Other characteristics of effective interventions were the provision of adequate time and intensity for the intervention, the involvement of families, particularly for younger children, the incorporation of self-assessment and feedback in interventions for older children, the inclusion of actions to modify the school environment, and the involvement of the larger community.[30] Overall, institutional support by means of health and nutrition policies, including the regulation of food marketing strategies,[31] the monitoring of the quality of foods and drinks available in schools, and the provision of adequate resources devoted to school-based nutrition education and programs to encourage physical activity, is required for effective obesity prevention actions.[32,33]

CONCLUSION

There is sound evidence that positive changes in food habits and physical activity could contribute to preventing the problem of overweight and obesity.[34] On this basis, in 2004 the WHO approved, as part of the 57th World Health Assembly, the Global Strategy on Diet and Physical Activity, which encourages all member states to develop and implement national action plans.[2]

In accordance with this directive, the Spanish Ministry of Health, along with the Spanish Agency of Food Safety, encouraged the development of the NAOS strategy as the result of the contributions of eight multidisciplinary working groups.[6,35] The strategy comprises a number of actions involving stakeholders in different sectors and includes recommendations for policy measures and regulations to create an environment conducive

to obesity prevention. As part of the strategy, the PERSEO project is a multicomponent school-based intervention to foster healthful dietary habits, to decrease sedentary behaviors, and to increase physical activity among children 6–10 years old. The intervention includes a school curriculum, changes in the school environment, and a component involving the family.[36]

Public health experts, academics, and politicians agree that there is a need for action to prevent obesity. Evidence shows that prevention is potentially more efficient than treatment alone in reducing obesity and thus should be addressed with priority in the public health sector.

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Declaration of interest. The authors have no relevant interests to declare.

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