

Sociodemographic and cultural factors of adult obesity in El Salvador: an exploratory cross-sectional study

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Background/objectives: The purpose of this study was to explore the sociodemographic and cultural factors associated with adult obesity in El Salvador, a country that has rapidly shifted from food insecurity to obesity as a primary health risk.

Subjects/methods: Using face-to-face interviews and a food frequency questionnaire, we interviewed a convenience sample of 180 Salvadorans who identified their dietary habits, perceived nutritional value of food items, and other factors influencing consumption.

Results: Obesity (BMI ≥ 30) was exhibited by 27.3% of participants, and another 41.1% were overweight (BMI 25-30). These results spanned all levels of socioeconomic status. Obesity prevalence, however, was only 18.5% in the most rural area. Obesity increased with age and was almost twice as prevalent in women as in men. Within the occupational subgroup of traditional market vendors, we observed an obesity prevalence of 39.8% as compared with 17.6% prevalence in non-vendors, indicating that in addition to these merchants' relative inactivity, the traditional market has actually become an obesogenic food environment. When asked to describe their dietary decisions, participants overwhelmingly pointed to personal preference and nutritional value as being very influential, while downplaying the effect of cost, convenience, tradition and advertising.

Conclusions: With the growing trends of globalization, urbanization, and industrialization, population-based approaches will be necessary to stem the rise in obesity. When setting priorities for such policy measures, precautions must be taken to not exacerbate preexisting health disparities.

Introduction

Rapid changes in demographics and nutrition in low and middle-income countries are raising urgent public health concerns of obesity-related non-communicable diseases in these countries.¹⁻⁵ Due in part to increasingly sedentary lifestyles and changes in food manufacturing and marketing, this phenomenon is seen even in regions that have previously been associated with undernutrition as a primary public health concern. In a systemic analysis of worldwide health surveys, Central America showed one of the greatest percent increases in obesity prevalence of any region of the world from 1980-2008, with the condition affecting over 33% of women in the region.⁶ El Salvador, the smallest and most densely populated Central American country, is at an advanced stage in such demographic and nutritional transitions. From 2005 to 2011, the percentage of overweight people in El Salvador jumped from 49% to 63% of the adult population, with 80% of women over the age of 40 overweight.^{7,8} While El Salvador has been very successful in reducing child undernutrition, it is now facing a different public health threat, with an overall obesity prevalence of 26.9%.⁹

While the effects of individuals' physical, economic and sociocultural environment are well understood in relation to under-nutrition, the distribution and determinants of obesity in El Salvador remain unexplored. Health workers and policy makers are not generally informed about the nature of the "double burden of malnutrition," the coexistence of diseases related to undernutrition and overnutrition in the country.⁴ The goal of this study is to help rectify this problem

by exploring the status of obesity and dietary habits of adults in El Salvador.

Materials and Methods

El Salvador is divided into fourteen sections called departments, which are grouped into four geographic zones—West, Central, Paracentral, and East. One municipality from each of the zones of the country was selected as a representative research site (Table 1), with the criteria of having a population of 1,000-30,000 and being associated with a "traditional market," an open-air mixture of stores and stalls selling traditional and modern foods and goods. Additionally, in response to rapid urbanization, a 1993 legislative decree instituted the Metropolitan Area of San Salvador (AMSS) as a fifth geographic zone, comprised of 27.3% of the total population of the country but only 3% of national territory.¹⁰ Within the AMSS, research was conducted in the Central Market, a traditional open-air market, and Metrocentro, the largest U.S.-style mall in Central America. These sites of commerce ensured access to Salvadorans who were "typical," if not statistically average, and representative of the general population. Sites were also selected based on support from local partner organizations such as health departments and city councils.

El Salvador's National Research Ethics Committee approved the study protocol. Details on the purpose and procedure of the study were given in Spanish on the participant's information sheet and read aloud by the interviewer. All participants gave written informed consent.

The study population was a convenience sample of male and female volunteers aged 18-55 years. Since El Salvadorans generally do not answer phone calls from unknown numbers, rather than using phone surveys, interviewers approached people in person, using a combination of passive (waiting for passers-by) and active (initiating conversation) recruiting to find participants. Exclusion criteria included pregnancy and any overt signs of illness, such as coughing. During July 2013, a total of 180 participants were interviewed at the six sites around El Salvador. Fifteen men and fifteen women were interviewed at each site and had their anthropometric measurements taken (height, weight, and waist circumference), as is typical for such a study. Interviews were conducted primarily in the midst of traditional markets, which are an integral part of the local food system. Due in part to there being more than twice as many 15-24 year-olds in the country as 45-54 year-olds (1,087,107 and 467,856 respectively), the convenience sample included almost twice as many participants in the youngest age group as in the oldest.⁸

Standardized interview data was collected by fifth-year nutrition students from the University of El Salvador. They collected demographic data (Table 2) as well as more detailed information on the participants' dietary habits and beliefs. The latter was collected using multiple choice questions followed by a food frequency questionnaire (FFQ) consisting of the fifty foods most commonly consumed in El Salvador and six non-traditional processed food items. Open-ended questions were also asked so participants could report consumption of food items not included in the list.¹¹ Participants were asked to rank how often they consumed each food item over the previous year (given eight options ranging from "Almost Never" to "Four or More Servings per Day"), as well as rank each food item's importance for good nutrition ("Not Important, A Little Important, Moderately Important, Very Important"). The FFQ was not considered reliable to estimate absolute nutritional intake and was only used to provide ranking of intake within the study population.¹²

Anthropometric measurements were all taken by a trained clinical technician. All data was collected in the morning for purposes of standardization. Waist circumference was taken with a snug flexible tape pulled horizontally mid-way between the lower rib and the iliac crest (generally two cm above the navel), with two cm subtracted to account for taking the measurement over the clothes (to respect cultural sensitivity).¹³ Height was measured to the nearest 0.5 cm with the head, scapula and buttock touching the vertical height-gauge. Participants were asked to remove all outer layers of clothing, including shoes, to ensure accurate measurement. Weight was then taken on a digital scale and corrected by subtracting 1 kg to account for the light clothing worn by participants, as has been done in similar studies.¹⁴ Body Mass Index (BMI) is commonly used as a surrogate for body fat, but its use as a predictor of cardiovascular risk and mortality has been discouraged in recent studies.^{15, 16} BMI was calculated as weight in kilograms divided by height in meters squared. Overweight, obesity and severe obesity were defined as BMI ≥ 25 kg/m², ≥ 30 kg/m² and ≥ 35 kg/m² respectively.

Waist-to-height ratio (WHtR), the circumference of waist divided by height, was used as an indicator of body fat distribution. Several studies have shown that WHtR correlates better than BMI with cardiovascular risk factors, coronary heart disease risk and stroke.¹⁶⁻¹⁹ For calculating risk associated with WHtR, general cutoffs of 0.500 for risk increase and 0.582 for substantial risk increase were used.²⁰ Research is ongoing to validate the clinical significance of these cutoffs.²⁰

SPSS version 19 was used for all statistical analyses, primarily percentages and frequencies. P-values were determined in order to demonstrate the difference between these groups. However, as sam-

pling was not random, no generalizations are made and confidence intervals are not used with given prevalence ratios (PR).

Results

Obesity was recorded in 27.3% of participants; another 41.1% were overweight (Table 3). Except in the oldest age group, the prevalence of obesity increased with age and was roughly twice as high in women as in men (PR = 1.88, $p < 0.02$) (Figure 1).^[1] (P-values were determined in order to demonstrate the difference between these groups; however, since the sample was not random and statistics could not be generalized to a larger population, confidence intervals were not computed). The female average WHtR was 0.570 (Figure 2), which is considered a risk equivalent to a BMI of 30.²⁰ We found that participants were generally not familiar with BMI, but readily understood when told that a healthy WHtR means that one's waist is under half of one's height. WHtR should be used to discuss weight concerns with Salvadoran patients and could lead to better outcomes than using BMI.^{21, 22}

Only 32% of men and 33% of women interviewed said that they eat according to a regular schedule, and 14.4% of men and 10% of women said that they currently followed a special diet (most commonly "low fat" or "low carbohydrate"). Eighty-seven percent of participants noted a difference between rural and urban diets. A majority of those who answered affirmatively went on to specify that they saw the rural diets as superior—, primarily due to a perceived abundance of fresh produce. The remainder said the urban diet is superior for offering greater variety or more protein.

Only 32% of men and 33% of women interviewed said that they eat according to a regular schedule, and 14.4% of men and 10% of women said that they currently followed a special diet (most commonly "low fat" or "low carbohydrate"). 87% of participants noted a difference between rural and urban diets. A majority of those who answered affirmatively went on to specify that they saw the rural diets as superior, primarily due to a perceived abundance of fresh produce. The remainder said the urban diet is superior for offering greater variety or

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more protein.

No strong correlation existed between WHtR and either educational status or type of dwelling. It was possible, however, to draw comparisons between groups from the different geographic areas. In the Central Market of San Salvador (mean age 36 years, with an even spread of participants throughout the 18-55 year age group), 43.3% of those interviewed were obese and another 46.7% overweight. In Metrocentro, San Salvador, whose population includes a high percentage of young students and urban professionals (mean age 31 years), only 13.3% of individuals interviewed were obese. Those living in the Western part of the country had a high prevalence of obesity (38.3%), despite being the youngest group (Table 1). In the most rural site, Arambala, where 86% of the inhabitants come from a rural background, only 18.5% of participants were obese and 36.7% overweight (PR compared with other sites = 0.65, $p =$ not significant). In regards to occupation, merchants in traditional markets ($n=51$) were much more likely to be obese than non-merchants ($n=129$) (PR = 2.26, $p < 0.003$). Severe obesity affected 13% of male merchants and 25% of female merchants.

By analyzing several characteristics, we examined influences on food selection using a Likert scale (Table 4). Some 82% of those interviewed cited preference as very influential in their food choice. 71% answered that their selection is very influenced by nutritional value. 70.6% of respondents were inclined toward price as very influential. Approximately 50% of participants viewed accessibility, speed and tradition as "very influential," however only 12.8% viewed advertisements in the same light. Despite that only 49.4% claimed being

very influenced by tradition, the results of the FFQ showed that tortillas, pupusas, and other types of traditional (especially corn-based) foods are of high daily consumption. Men and women reported similar factors influencing food selection.

Limitations

Despite having local professionals conduct the interviews, the current study was limited by the difficulty in communicating certain concepts with which participants were unfamiliar (e.g., “serving size” of food items). To overcome this, the interviewers used open-ended questions and approximations of certain terms and concepts where appropriate (e.g., using a cupped hand to visually convey “serving size”). Other limitations include the assumptions made surrounding food choice. For example, when describing preference, subjects of similar studies tend to say taste is the primary factor, but research has revealed a complex interaction of social, culture, and environmental/economic influences that subjects might not be aware of.²³ Additionally, a high percentage of respondents indicated that they choose foods based on nutritional value. However, given the recent introduction of myriad novel food items and abundance of cheap sugar and oils, the respondents who gave these data may not have all necessary knowledge about the nutritional value of the foods that they choose. For example, 85.5% of participants consume one to four servings of added sugar per day, and 58.4% said sugar is moderately or very important for good nutrition. Also, overestimation of consumption was likely in regards to food items considered “healthy” such as fruits and vegetables.²⁴ More sophisticated methods for estimating total consumption should be used in future studies to correlate dietary habits with disease.²⁵

Discussion

The above data shows that obesity is an emerging problem in El Salvador, disproportionately affecting women and traditional market vendors. It is possible that the oldest age group was slightly less obese than expected because they grew up in a less obesogenic period of El Salvador’s history, as they were born between 1958 and 1967 and entering young adulthood during El Salvador’s civil war. The rates may continue to climb as the population ages and more overweight people cross the threshold to obesity.

Trade liberalization (i.e. reducing tariffs and opening markets) has been persuasively implicated as a substantial driver in the increase in obesity and related diseases in the developing world.²⁶⁻²⁸ Such liberalization has been ongoing in Central America since the 1980s, culminating with El Salvador’s 2006 entrance into the Central America Free Trade Agreement (CAFTA).²⁹

Rapid urbanization also plays a key role, as the rural population of El Salvador dwindled from 67% to 37.3% from 1960-2007 and continues to fall.³⁰ Meanwhile, hundreds of thousands of Salvadorans who were displaced to the United States as refugees dur-

ing the civil war have since returned home, bringing with them their desire for processed foods.²⁹ Those who remain in the United States and other countries contribute billions annually in remittances to their relatives in El Salvador (17% of GDP of El Salvador in 2011), much of which goes toward discretionary spending on processed food items.^{29, 31, 32} Also, relatives abroad may have greater purchasing power and encourage the preexisting attraction to processed food when visiting their country of origin. In general, global food brands also confer additional status on the user, but the most heavily marketed foods are not the “healthiest”.^{33, 34} A vast majority of consumers may not realize that advertisements influence their food consumption in some form.³⁵⁻³⁸ As people do not want to feel coerced or manipulated, they underestimate the importance of external factors on their daily food choices. To address this, it is necessary to not only target individual behavior, but also shape policies toward encouraging a healthier food environment.

A large enough difference was found between male vs. female to be statistically significant ($p < 0.02$). This was interesting considering that both genders responded similarly about influences of food selection. There are certainly a mix of social, cultural, environmental, and biological factors contributing to this disparity, and it is an interesting contrast to the United States where obesity prevalence in no different between women and men.^{39, 40}

The high prevalence of obesity among merchants could be attributable to several factors: First, the people in this occupation remain relatively sedentary, rising only to tend to their clients at the moment of sale (Cecilia M. Suazo, MD, MPH, personal communication, September 4, 2013). Second, these people spend the greater part of their day in an environment in which every kind of food is conveniently available, leading to excess consumption.⁴¹ Third, observational data suggest that many merchants do not eat healthily, despite healthy foods such as fresh fruits and vegetables being among the products they sell.⁴² The penetration of processed foods into the traditional diet and an abundance of cheap sugar and oils is a recent phenomenon that warrants further research.

A logical next step is a larger scale study that can report on the prevalence of aforementioned risk factors in El Salvador, especially to uncover a difference between urban and rural populations. Also, research can be conducted on Salvadorans residing abroad to look for changes in risk factors associated with emigration. Additional studies should be conducted in traditional markets to clarify the changes that have contributed to current obesity amongst vendors. A history of undernutrition combined with current overnutrition seems to be triggering the current rise in obesity. Ultimately, a large-scale longitudinal study would best serve to show causation between identified drivers and the increasing prevalence of obesity in El Salvador. In the meantime, nutrition education should

be implemented as a low-cost intervention, especially focusing on the risks of processed foods and excess sugar.

Furthermore, with the growing trends of globalization, urbanization and industrialization, population-based approaches will be necessary to stem the rise in obesity. Given this rapidly increasing health burden, it is vital for public health interventions to be formed around the external environmental, economic, and sociocultural factors that drive individual risk. For example, in addition to interventions for health education, other low-and-middle income countries have had success in reducing obesity-related diseases by regulating food manufacturing and marketing, as well as by promoting improved urban design.⁴³ Still, a majority of the effectiveness research of such interventions is from high-income countries, so when setting priorities for such policy measures in limited-resource settings, precautions must be taken to not exacerbate preexisting health disparities.⁴⁴

Acknowledgements

The authors thank Lic. Josefina Sibrian and the staff of the Department of Nutrition at the Universidad de El Salvador for their support. Also Iris Cazun, Maria Luisa Cruz Ortiz, Mario Gonzalez, and Victor Martinez for performing the interviews and James Bindon, Ph.D. and William Ventres, M.D., M.A. for help with the study concept. They also thank the Fulbright Program of the Institute of International Education for funding this project.

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