



ORIGINALES

Study of families: Environmental and Cultural Factors associated with Overweight and Obesity

Estudio en familias: factores ambientales y culturales asociados al sobrepeso y obesidad

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ABSTRACT

Objective: Determine whether overweight and obesity in family members are related to environmental and cultural factors regarding the functioning of families.

Method: Descriptive Correlational Study. The sample consisted of 198 family members. A General Data Card, a Scale to Evaluate Intra-family Relations, the Food Selection Questionnaire, and the Physical Activity Questionnaire were used.

Results: 8.6% of the participants 18 years old or older were overweight, and 46.5% had some degree of obesity. The Body Mass Index of adults was related to total kilocalories as a product of physical activity ($r_s=.594$; $p<.01$) and with the subscales, eating ecology ($r_s=.160$; $p<.05$) and nutritional value ($r_s=.242$; $p<.01$). Cultural values were not associated with the Body Mass Index ($r_s=.242$; $p>.01$).

Conclusions: In this sample, Overweight/Obesity was associated with environmental factors.

Keywords: Family; Culture; Environment; Overweight; Obesity

RESUMEN

Objetivo: Determinar si el sobrepeso y la obesidad en los integrantes de la familia están relacionados con los factores ambientales y culturales relativos al funcionamiento de la familia.

Método: Estudio descriptivo correlacional. La muestra fue constituida por 198 integrantes de familias.

Se aplicaron una Cédula de Datos Generales, una Escala para Evaluar las Relaciones Intrafamiliares, el Cuestionario de Elección de Alimentos y el Cuestionario de Actividad Física.

Resultados: El 8.6% de los participantes mayores de 18 años presentó sobrepeso y el 46.5% algún grado de obesidad. El índice de masa corporal de los adultos se relacionó con las kilocalorías totales producto de la actividad física ($r_s=.594$; $p<.01$) y con las subescalas ecología de la alimentación ($r_s=.160$; $p<.05$) y valor nutritivo ($r_s=.242$; $p<.01$). Los factores culturales no se asociaron con el índice de masa corporal ($r_s=.242$; $p>.01$).

Conclusiones: En esta muestra el Sobrepeso/Obesidad se asoció con los factores ambientales.

Palabras clave: Familia; Cultura; Ambiente; Sobrepeso; Obesidad

INTRODUCTION

Overweight and Obesity (OO) are multifactorial chronic illnesses in which genetic and environmental factors are involved; they manifest through pathological expansion of body fat tissues⁽¹⁾ and with abnormal or excessive accumulation of fat, characterized by a Body Mass Index (BMI) higher than 25 kg/m² (overweight) or ≥ 30 kg/m² (obesity) in adult individuals⁽²⁾.

OO is a public health problem because of its impact on morbidity and mortality, life quality and sanitary expenses⁽³⁾. Obesity is the fifth cause of death worldwide and 2.8 million adults die every year for this reason. The morbidity load attributable to OO can be identified by its etiology. 44% is due to diabetes, 23% is due to ischemic cardiopathology, and between 7% and 41% is due to some type of cancer⁽²⁾. The prevalence of OO in several countries has shown a significant increase as a result of social changes such as food being more readily available and a progressive decline of physical activity⁽⁴⁾.

The particular case of Nuevo Leon, Mexico, is a source of concern because it shows similar or higher values than the national average. In Nuevo Leon, OO affect 39.3% of adolescents between 12 and 19 years of age, and 71.7% of the adult population between 20 and 59 years of age. Likewise, the prevalence of abdominal obesity in this age group (20-59 years of age) is 66.4% among men and 76.2% among women; in other words, 9.8% more women than men⁽⁵⁾ have this problem. Even though the general presence of OO in a population group may have multifactorial causes, it could be framed and spread because of an inappropriate family life style.

The family is defined as a social group that brings its members together based on kinship, because of either blood, marriage or adoption. People live together for an indefinite period of time during which they assume responsibilities that affect the preservation of human life, development, health, and well-being⁽⁶⁾. Life styles are learned and promoted within the family throughout the life of its members. Children and adolescents are more likely to learn healthy or unhealthy life styles that are prevalent in the environment in which they live. During their adult age, this contributes to the development of degenerative chronic illnesses like OO⁽⁷⁾.

In the social area, another factor that could lead to the development of OO is the culture. Cultural eating habits influence individuals through the way the family functions. It refers to the way in which individuals behave towards one another. In other words, a set of family links with identified characteristics and behaviors that can be assigned a value⁽⁸⁾. In the related literature, there is a diversity of instruments and models that can be used to assign a value to these links, characteristics, and

behaviors associated with the family. One example of these is the Calgary Model of Family Assessment⁽⁹⁾.

Based on the existing data of OO and the resulting health problems, it is important to know the characteristics and activities of the family members that could influence the development of OO. The purpose of this work was to determine whether OO of family members is related to environmental and cultural factors regarding the functioning of the family.

METHODOLOGY

The design was correlational, descriptive, and transversal⁽¹⁰⁾. The population of interest consisted of individuals with or without OO and relatives who live under the same roof. Seventy families totaling 198 members were interviewed. The sample was calculated using the Query Advisor Version 4 package.

The study complied with the provisions of the Ethics and Research Committee of the sponsoring institution.

Pencil and Paper Tests

Environmental Factors

The environmental factors (physical activity and eating) were measured using the Physical Activity Questionnaire (PAQ) validated in Mexican population with acceptable reproducibility values (Intra-class Correlation = 0.62, $p < 0.001$) and sensitivity ($p < 0.01$). The questionnaire was prepared to be a self-report divided in accordance with the hours of the day in 15-minute periods in order to indicate the activity or activities carried out by the person. The activities carried out by the family members could vary from very light activities, like sleeping, up to very intense activities or sports, like moderate impact aerobics or soccer.

The questionnaire includes a three-day record of a person's physical activity divided in 15-minute periods that are later converted to kilocalories used (Kcal) using the following formula: $\text{Kcal} = \text{value of the activity in MET} \times \text{weight in kg} \times \text{time in hours}$ (CAF)⁽¹¹⁾.

Food intake was measured using the Spanish version of the Food Selection Questionnaire (FSQ)⁽¹²⁾ which has 36 questions divided into 9 dimensions (health, mood, comfort, sensory attraction, natural content, price, weight, familiarity and ethical issues). Each question has answer options ranging from 1, not important, to 4, very important. This questionnaire has shown an acceptable internal consistency with Cronbach's Alpha values from 0.72 to 0.86⁽¹³⁾.

Cultural Factors

The cultural factor (customs) was measured with the Scale of Intra-family Relations Assessment (IRAS), an instrument that consists of 56 questions, with reliability of .93 and including three dimensions: union and support, expression, and difficulties. We are talking about a self-applicable scale with five options for the answer, ranging from Completely in Agreement (CA=5) to Completely in Disagreement (CD=1)⁽¹⁴⁾. The cultural factors (religion and educational level) were recorded in a personal data card

(PDC), which also included socio-demographic data such as age, gender, marital status, religion and years of formal education.

Measurements

Height was measured using the SECA 213 scale and weight using the SECA 700 scale. Based on weight and height, the BMI was estimated. In order to classify adults with OO, the BMI was calculated following the recommendations given by the World Health Organization. Children were classified as low weight when their percentile was lower than 14%, normal weight when their result was from 14.1 to 16.5%, overweight with 16.6 to 18.2%, and obese when the values were higher than 18.2%.

Procedure for the collection of data

Once the permissions were obtained in each institution, people who fulfilled the inclusion criteria were contacted in the waiting room of a health center. The candidates received an explanation of the identity and educational background of the researcher, the objectives of the study, and the type of questions and measurements. Emphasis was given to the importance of contacting at least two family members who lived in the same house, and they were offered the option of making one home visit or making one appointment for a new contact in the health center. Based on the decision made by the individuals to participate in the study and under the authorization of an informed consent, the measurements were taken, the questionnaires were completed and, in the end, we thanked every participant for their willingness to be part of the study.

Analysis of the data

The data were analyzed with the SPSS software, version 21.0. Frequencies and percentages were used for the description of the sample. The distribution of data was evaluated and correlation analysis were performed. The alfa value was .05.

RESULTS

General Characteristics of the Sample

The families studied included several of the following: father, mother, son, daughter, nephew, niece, brother, sister, grandparents, uncle, aunt, father or mother-in-law, grandchild, who visited a health center and lived in the same home. 198 members representing 70 families were analyzed.

The general characteristics of the family members (age, gender, marital status, religion, and years of formal education), are presented with measurements of central tendency and scattering. Most of the participants were adults between 18 and 85 years of age (93.3%), who were responsible for a family or parents of minors between 11 and 17 years of age (6.7%). The average age of the participants was 35.22 years ($SD=13.3$, Range 11.85). 63.8% of the sample were women. The average number of years of formal education was 12 years. 51.4% of the participants mentioned that they were married and 89% expressed that they were Roman Catholics.

Regarding the prevalence of OO, 8.6% of the participants older than 18 were overweight and 46.5% had some degree of obesity (Table I).

Table I. Classification of BMI of adults based on the parameters of the WHO (2012).

Category	BMI (kg/m ²)	f	%
Normal	18.5-24.9	30	15.1
Overweight	25-25.8	17	8.6
Obesity	25.9-29.9	92	46.5
Obesity I	30.0-34.9	56	28.3
Obesity II	35.0-39.9	3	1.5
Total		198	100

Note: BMI=Body Mass Index; f = frequency; %= percentage

n=198

Regarding the role of each participant in the family, 3.5% (7) of the children were overweight, 9.5% (19) of the fathers and 14.6% (29) of the mothers were obese, as reported in Table II.

Table II. Frequencies and percentages of BMI for family members based on their role within the family:

Family Member	N		OW		O		OI		OII		TOTAL
	f	%	f	%	f	%	f	%	f	%	
Father	3	1.5	2	1.0	19	9.5	11	5.5	3	1.5	38
Mother	8	4.0	5	2.5	29	14.6	14	7.0	-	-	56
Son/ Daughter	7	3.5	7	3.3	24	12.1	14	7.5	-	-	52
Brother/ Sister	5	2.5	-	-	7	3.5	6	3.0	-	-	18
Grandfather/ Grandmother	1	0.5	-	-	-	-	1	0.5	-	-	2
Uncle/Aunt	0	0	1	0.5	2	1.0	1	0.5	-	-	4
Nephew/Niece	3	1.5	-	-	3	1.5	2	1.0	-	-	8
Father/Mother- in-law	1	0.5	-	-	2	1.0	4	2.0	-	-	7
Daughter- in-law	1	1	1	0.5	3	1.5	0	0	-	-	5
Brother/Sister -in-law	1	1	0	0	2	1.0	1	0.5	-	-	4
Grandchild	0	0	1	0.5	1	0	2	1.0	-	-	4
Total	30	16	17	8.3	92	45.7	56	28.5	3	1.5	198

N=Normal, OW=Overweight O=Obesity, OI=Obesity I, OII=Obesity II. n=198

Regarding minors, 66.6% (8) were obese and 16.7% (2) were overweight or were of normal weight

Inferential Analysis

Before the inferential analysis, the Kolmogorov-Smirnov test was performed with Lilliefors correction in order to determine the data distribution. Due to the lack of normality ($p \leq .001$), it was decided to use non-parametric statistics.

Regarding physical activity in three-hour periods, 33.8% (71) mentioned “remaining sitting down”, 29.5% (62) engage in moderate physical activity (walking, shopping, riding a motorbike, etc.), and 18.6% (39) did light manual work (cleaning/house cleaning).

In order to know the association of the participants' BMI with environmental factors (physical activity and eating), a Spearman correlation test was used for the set of variables. It was found that the 7 subscale had a positive significant correlation with the BMI of adults ($r_s = .142$; $p = .047$); total Kcal with the BMI of adults ($r_s = .549$; $p = .000$); subscale 8 with BMI of adults ($r_s = -.174$; $p = .014$); and subscale 5 with BMI of minors ($r_s = -.591$; $p = .043$) showed a significant negative correlation. No association was found between BMI and cultural factors ($p > .05$).

DISCUSSION

In this study, more than 80% of the family members were older than 18. They showed high BMI and, additionally, at least one family member was OO. This agrees with the report prepared by Rossi de los Angeles, Castellanos Reyes, and Saint-Hilaire Zayas⁽¹⁵⁾. In this report they mention that some family members who live under the same roof relate with each other in such a way that they influence other family members in the development of not very healthy life styles, such as excessive consumption of kilocalories and little or no physical activity, thus contributing to weight gain. There were more women than men in the study and most of them were mothers. In that role, they had the responsibility for managing the home resources and feeding decisions. Women are responsible for most home tasks and they play an important role in producing life style changes, especially in minors⁽¹⁶⁾.

Regarding the prevalence of OO, it was found that more than 40% of adults were obese, 10% were overweight and more than 60% of minors were obese, which is considered high. In contrast, in children from Spain, prevalence of 12.4% in the EnKid study, 15% overweight, and 10.5% obesity have been detected in the state of Cordoba, and values up to 26.1% have been observed in the Aladino study^(17,18). This situation can be explained from the health social determinants since the results obtained in both studies are samples of contextual, ethnic, and cultural locations, with customs that may be different within the family. It is also possible that food preparation, selection and consumption may be different. However, in spite of the significant differences in childhood obesity found in both studies, an important health hazard situation can be recognized. Therefore, this phenomenon can be explained by the fact that children are constantly exposed to publicity of food and drinks with high caloric content, rich in fat, sugar, and salt. There is also a large offer of this type of food in all the places where children go. This has caused an important change in children eating habits⁽¹⁹⁾.

In addition, the differences found regarding the overweight and obesity figures, may be the result of the methodological criteria used for the diagnosis of overweight and obesity. In other words, while some authors use diagnosis criteria based on

percentiles (90 and 97 percentile), others make use of American Task Force criteria, or criteria from the World Health Organization or figures provided by the parents⁽¹⁸⁾.

Regarding the purpose of this study, which was planned to know whether OO of family members is related to environmental and cultural factors concerning the functioning of the family, it was found that environmental, physical activity, and eating factors play an important role in this area, that is, they are related. This situation can be explained based on the social representations created by family members for various important activities like eating and the practice of physical activities. In the case of diet, there is an important social representation because it is vital for survival; it is a necessary source of energy, which has a direct influence on health.

Families see the act of eating or being fed as an indicator of well-being and balance⁽²⁰⁾.

In spite of the above, it is worth noting that said relation possibly results in the high obesity figures, the possible consumption of more than the required calories and a low level of physical activities for family members. This indicates that perhaps their perception regarding the status of family health and risk for the development of future complications is underestimated; these latter data are supported by the results of Cabello and Zuñiga⁽²⁰⁾. They found that obese people express happiness or contentment with their big bodies and excessive body fat.

Other arguments that can explain the identified findings suggest that the genesis of obesity is associated with stressful life events and with the use of food as a refuge to compensate frustrations, sadness, needs, and fears that can emerge within families. These are part of the interior and exterior interactions of said families, represented by the environment that surrounds eating in the family. Life styles, social support, eating behaviors, feelings, attitudes, food availability and sites for the practice of physical activities as well as cultural aspects, like religion and customs are observed in this environment^(19, 21).

Based on the "customs" variable, no relation was identified that could be the result of methodological aspects, such as the type of questionnaire used or the design of the study. Based on the phenomenological or ethnographic theory, it may be possible to get close enough to the families and have an in-depth understanding of the relation mentioned in the purpose of this study. Worth mentioning is the fact that the genesis of obesity has a strong cultural explanation. In other words, from the perspective of Albert Bandura, children learn and imitate the behaviors of peers or of older family members, like siblings, parents, uncles, aunts, and grandparents. These behaviors may be characterized by customs, such as unhealthy eating habits or lack of physical activity, whereas good eating habits and physical activity are important for good health. Other cultural aspects that affect family behaviors are the socio-economic status, location of the home, breakfast or dinner, lack of a strict control on the selection of foods and very little family pressure for the consumption of foods⁽²²⁾.

The results of this study are of particular interest for the formulation of research proposals that attempt to produce changes in the health indicators of families. The data could even be used to influence the decision making process in the first level of health care, as evidence of health guidelines and ideas for the design of future research work.

CONCLUSIONS

It is very important to value the function of the family as an institution where behaviors are learned and become social customs. In this case, we are referring to eating and physical activity habits. In the specific case of parents, they play a very important part as role models for their underage children. Consequently, parents have the responsibility to teach healthy life styles in order to prevent illnesses associated with Overweight and Obesity (OO).

Based on the results found in this sample of 70 families, OO is associated with environmental factors such as physical activity, ecology of eating, weight control, and the nutritional value of food. In contrast, cultural factors such as customs regarding the union, support, expression, and difficulties were not associated with the presence of OO.

High percentages of overweight/obesity were found. The practice of physical activities with health benefits was very low. The above is true in both adults and minors who were part of the families being studied.

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