Original Article

Infant and toddlers' feeding practices and obesity amongst low-income families in Mexico

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The aim of this study was to determine the risk factors of childhood obesity among infants and toddlers from low-income families from three cities in México. This is a cross-sectional study of mothers and their infants and toddlers attending a vaccination centre at three primary care clinics in Tijuana, Tuxtla, and Reynosa. Anthropometric measurements of the mothers and children were conducted at the clinic and a questionnaire was administered to the mother. Eight-hundred and ten mothers and their 5 to 24 months old infants participated in the study. Average age for the mothers was 24 (21-28) years, and 57% of them were either overweight or obese. The children's average age was 12.7 (5-24) months. Overall overweight prevalence in this sample was 11% and obesity 8%, these increased with age, from 3% for overweight and 6 % for obesity before 6 months, to 13 and 10% between 12 to 24 months respectively. Thirty-five percent of infants were breastfed ≥6 month and 92% were introduced to other solid foods before 6 months. Introduction of high-fat content snacks (HFS) and carbonated and non-carbonated sweetened (CSD) drinks starts before 6 months and more than sixty percent of the children between 12 to 24 months of age were eating HFS and CSD sweetened drinks at least once a week. Consumption of snacks and CSD sweetened drinks (≥1 week) was associated with being overweight and obese (crude), OR, 1.82; 95% CI=1.24-2.65 (p=0.002). These results suggest that preventive programs should be initiated during pregnancy and continued.

Key Words: infant obesity, feeding practices, breastfeeding, weaning, migration

INTRODUCTION

The prevalence of childhood overweight (OW) and obesity (OB) in Tijuana is among the highest in the world (48% among 6 to 12y) and is increasing at an alarming rate.[1] Likewise, the prevalence of overweight and obesity among adolescents in Tuxtla Gutierrez (Tuxtla) was reported to be 32%, including a high prevalence of metabolic syndrome.[2] These two cities are located in two Mexican states that border the USA and Guatemala respectively; they have opposite rates of net migration (1.8 vs. –0.3) and human development index (0.77 vs. 0.58).[3] Increased prevalence of childhood obesity is believed to be a combination of genetic causes, pre- and postnatal factors, increasingly sedentary lifestyles, and excess dietary consumption.[4-7] Social and demographic factors, such as level of education, migration status, and income have been associated with obesity.[8-11] The ecological model suggests that micro- and macro-environmental factors modulate food practices and physical activity behaviors.[12-13] Feeding is a central aspect of learning in which intense interactions are involved between parents and children. These might contribute to the formation of the child's feeding habits during a sensitive period of brain development.[14] Usually, parents select the feeding method for their newborn baby and determine, along with their economic resources and cultural background, which foods would be available.[15-17] Although there have been studies analysing risk factors among school age children in Mexico,[18-19] and among 5 to 24 months old Hispanics,[20] studies on feeding practices of infants and toddlers in different regions of Mexico are lacking. The aim of this study was to determine the risk factors of childhood obesity between infants and toddlers from low-income families from three cities and regions of México.

MATERIALS AND METHODS

Settings

Baja California (known as Baja) is the most northwestern Mexican state and it borders the US state of California.

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Net migration rate projections (immigrants minus out migration) for Baja California were 1.8, and the human development index was 0.77, ranking seventh out of 31 states of Mexico. In Mexico, those who are not eligible to receive formal social security institution health care are eligible to the primary health care settings of the Insituto Estatal de Salud (IES) and patients usually come from the lowest income levels. In Baja, approximately 38.6% of the total population is eligible for the IES health care.[3] The IES in Tijuana has 34 primary care clinics; during 2008, the clinic where the study was conducted attended to 56,174 patients and delivered vaccines to 15,206 children (data from the health care registry, 2009).

Chiapas is a South-eastern Mexican state and it borders Guatemala. Net migration rate projections for Chiapas were -0.3, and the human development index was 0.58, ranking last among all states of Mexico.[3] In Chiapas, approximately 65% of the total population is eligible to receive health care at the IES.[3] The IES in Tuxtla Gutiérrez has 7 primary care clinics; during 2008, the clinic where the study was conducted attended to 59,400 patients and delivered vaccines to 31,477 children (data from the health care registry, 2009).

Tamaulipas is a North-eastern Mexican state and it borders the US state of Texas. Net migration rate projections for Tamaulipas were 0.8, and the human development index was 0.74, ranking 11 in Mexico.[3] In Tamaulipas, more than 50 % of the total population is eligible for health care at the IES.[3] The IES in Reynosa has 13 primary care clinics; during 2008, the clinic where the study was conducted attended to 46,187 patients and delivered vaccines to 21,964 children (data from the health care registry, 2009). Although there are no comprehensive studies assessing the food habits of the three regions, results from different publications suggest that food habits and consumption are different based on cultural differences and food availability.[21-23]

Subjects and Recruitment procedures

The interviewers were: a medical student from the Universidad Autónoma de Baja California and two nutrition students from the Universidad de Ciencias y Artes de Chiapas and from the Universidad Autonoma de Tamaulipas respectively. They were trained to take the infants measurements and conduct interviews. Mothers of healthy children ranging from 6 to 24 months, attending the vaccination area in the health care centre, were asked to participate. Interviews were conducted from January to March of 2009. Families were excluded if the child had a missing height or weight. As recommended by the WHO and the CDC, we excluded children who had biologically implausible values BMI z-score below –4 or above 5. Children with mental or physical disabilities were also excluded.

The Human Subjects Committee of the Instituto de Nutricion de Baja California approved the study and the Human Subjects Committee of the Nutrition Academic Group of the University Autonomous of Baja California also approved the study. Written, informed consent was obtained from all parents.

Questionnaire Contents

The final version of the questionnaire includes five sections: 1) maternal attitude about their children's weight; 2) mothers' feedings practices and beliefs; 3) mothers' beliefs on their child's physical activities; 4) socio demographic information; and 5) evaluation of mothers and children's weight and height.

A pilot test was conducted among 34 mothers with children ranging from 6 to 24 months old who attend the vaccination waiting area of two different health care centres of Tijuana. The questionnaire was repeated 10 days later. Reliability for all the questions were 0.81 ($p < 0.01$), and 90% of the items had a consistency higher than 0.70 ($p < 0.01$). Feeding practices were questioned to identify if the child was exclusively breastfed, formula fed, or breastfed, supplemented with formula. Children were divided into two groups: exclusively breastfed children and non-breastfed children.

Anthropometrical Measurements

Both the children's and mothers' weight and height were measured and recorded at the primary care clinic. Body mass index (BMI, in kg/m^2) was calculated. The z-scores for BMI-for-age were calculated for each child using the modelling formula provided by the WHO.[24] Adult OW was defined as BMI 25–29.9 and OB as BMI ≥30. In children, the overweight and obesity classifications proposed in the application of the under-five standards are: >1 to ≤2 SD, at risk of overweight; >2 to ≤3 SD, OW; and >3 SD, OB.[24]

Food Consumption and index

The questionnaire included consumption of fruits, vegetables, juices, soft-drinks, and HFS (potato and corn chips). A healthy food consumption index (HFCI) was created by adding the consumption of fruits and vegetables in those babies with no consumption of carbonated and non carbonated sweetened drinks (CSD), juices, and high-fat content snacks (HFS). Non carbonated sweetened drinks and HFS were considered high-energy foods and they were quantified together.

Statistical Analysis

Analyses were conducted using the SPSS for personal computers, for Windows version 11.5.

To test the hypothesis of differences in distribution of: OW and OB, years of education, household incomes, place of birth, child's weight status, breastfeeding, categories of time of breastfeeding and weaning, consumption categories of fruits, vegetables, CSD, juices and HFS, and the food consumption index between cities, chi-square tests was performed. To test differences of medians of mother and child's age, mother and child's BMI, BMI z-score, child's birth weight, breastfeeding period, weaning time between cities, Kruskal-Wallis tests were performed. Binary and multinomial logistic regressions were used to assess obesity odds ratio (OR) of breastfeeding, weaning, food consumption, mother's age, household income, and years of education and migration status. Multivariate logistic regression adjusted by migration and household income was used to compute the relationship between CSD, HFS and a combination of both (independent variables) and the presence of BMI >2 z-scores (dependent

variable). Since there were no mothers born out of the state of Chiapas in Tuxtla, this group was withdrawn from the analysis of regression for migration.

RESULTS

Mothers' General Characteristics

The participants were 810 mothers and their babies ranging from ages 5 to 24 months. The average age for the mothers was 24y (21-28), 57% of them were either OW or OB (BMI≥25). Table 1 shows general characteristics by place of residence of the mothers and children. All the mothers in Tuxtla were born in the state of Chiapas, while only 45% of the residents in Tijuana were born in Baja.

Children's General Characteristics

The average age for children was 12.7 (5-24) months. Table 1 shows the statistical difference in weight status. Overall possible risk of overweight, OW and OB was 42%, which increases with age from 25.8% before 6 months of age, 37.8% between 7 and 12 months of age, and 50.5% between 12 to 24 months of age. Overall overweight was 11% and obesity was 8%, both of which increase with age from 3% for OW and 6 % for OB before 6 months, to 13% and 10% between the ages of 12 to 24 months respectively (Table 2).

Food Practices and Food Index

The highest percentage of breastfeed babies for more than 6 months was found in Tuxtla. Ninety-two percent of mothers introduced other solid foods before 6 months of age to their children; this was slightly higher when mothers were born in the state of residence ($p<0.04$). Table 2 shows the consumption of fruits and vegetables, CSD, juices, and HFS by age group. Differences in breastfeeding, weaning, consumption of vegetables, fruits, HFS, and juices were found between cities (Table 2). However, no difference was found between cities in the very high consumption of CSD. More frequent and longer periods of breastfeeding were found in Tuxtla (Table 2). In Table 3, the Odds of the child being OW or OB by different risk factors are shown in different sections. Additionally, the odds are also shown on different risk factors from weaning before 6 months of age, having a monthly household income of more than 600 dollars, having more than 12 years of education, and having migrated to the state of residence (Table 3).

DISCUSSION

Overweight and Obesity

The highest possible risk of OW, OW and OB was found in Tijuana, followed by Reynosa and Tuxtla (Table 1). The prevalence of OW (11%) and OB (8%) increases with age: OW increases from 3% in infants younger than 6 months to 13% in those older than 12 months, and OB from 6% to 10% respectively (Table 2). These results are much higher than the 5% observed at the Mexican Health

Table 1. Mothers and infant profile characteristics

Variable	Number of subjects (range)				
Mother's profile	Total N=810	Tijuana n=289	Tuxtla n=266	Reynosa n=255	*p*
Age (years)	24 (21-28)†	25 (21-30)	23 (20-28)	25 (23-28)	0.002
Body mass index	25.5 (22.9-28.3)	25.3 (22.2-29.9)	25.6 (23.4-27.6)	25.6 (23.8-28.0)	0.66
Weight status (BMI)					
<18 (%)	1.6	2.0	0.7	2.1	
18.5-24.99 (%)	41.6	45.0	43.0	37.0	0.001
25-29.99(%)	39.4	27.0	43.0	48.0	
≥30 (%)	17.4	26.0	14.0	13.0	
Years of education (years)					
≤7 (%)	28	28	35	29	
7-9 (%)	40	45	34	39	0.001
≥12 (%)	32	27	32	35	
Household Income (dollars/month)					
<300 (%)	49	21	84	49	0.001
300-600 (%)	40	53	17	39	
≥600 (%)	7	26	0.4	6	
Place of Birth (State of Residence) (%)	45	18	100	51	0.001
Infant Profile					
Male (%)	51	46	54	53	
Age (months)	12 (8-17)	12.5 (7-18)	11.0 (7-16)	12 (7-18)	0.49
Birth weight (kg)	3.2 (2.9-3.5)	3.39 (3.0-3.6)	3.15 (2.9-3.5)	3.2 (2.9-3.5)	0.001
Body mass index	17.6 (16.4-19.0)	18.0 (17.0-19.4)	17.3 (16.2-18.7)	17.1 (16.0-18.7)	0.001
BMI z-score	0.74 (-0.12-1.65)	1.16 (0.27-2.04)	0.48 (-0.26-1.35)	0.55 (-0.48-1.62)	0.001
Child's Weight Status (WHO criteria)					
Severely wasted (%)	0.71	0.3	1	2	
Wasted (%)	2.3	1	3	4	
Normal (%)	54.9	46	61	58	0.001
Possible risk of overweight (%)	23.8	29	22	19	
Overweight(%)	10.7	14	8	10	
Obese (%)	7.4	11	5	8	

†(min-max)

Table 2. Infant's food consumption practices and obesity trends

Variable	Age (month)	Total N=843 %	Tijuana n=300 %	Tuxtla n=279 %	Reynosa n=263 %	*p*
Breastfeeding (yes)		83	77	87	85	0.004
Breastfeeding period (months)		5.5±4.3 (0-20)	4.5±4.1 (0-20)	6.2±4.1 (0-20)	5.9±4.7 (0-20)	0.001
Breastfeeding ≥6 months		35	30	42	35	
Weaning time		5.1± 1.5	5.4± 1.6	5.0± 1.4	4.9± 1.5	0.001
Weaning ≤4 months		11	8	14	12	0.06
Weaning ≤6 months		92	88	93	97	0.001
Juices (≥3 weekly)		73	72	63	85	0.001
Vegetables (≥7 weekly)		45	68	26	41	0.001
Fruits (≥7 weekly)		45	56	32	46	0.001
HFS (≥1 weekly)		39	45	39	31	0.003
CSD (≥1 weekly)		38	38	40	34	0.33
Juices (≥1 weekly)		94	91	95	97	0.02
HFCI		31	41	23	29	0.001
Normal Weight (z-score <1.99-1.0)	< 6	71	80	61	76	0.21
	6-12	60	50	67	64	
	12-24	46	37	56	46	
Overweight (BMI z-score >2)	< 6	3	5	2	2	NED
	6-12	10	14	8	7	
	12-24	13	15	15	10	
Obesity (z-score >3)	< 6	6	10	7	4	NED
	6-12	6	5	4	8	
	12-24	10	10	4	8	
Vegetables (≥7 weekly)	< 6	46	67	38	44	0.001
	6-12	50	75	30	41	
	12-24	42	62	18	38	
Fruits (≥7 weekly)	< 6	52	67	48	51	0.002
	6-12	43	56	31	40	
	12-24	45	55	26	49	
HFS (≥1 weekly)	< 6	2	0	3	2	NED
	6-12	18	22	20	10	
	12-24	68	71	71	60	
CSD (≥1 weekly)	< 6	4	0	5	4	NED
	6-12	19	14	23	19	
	12-24	64	63	70	59	
Juices (≥ 1 weekly)	< 6	89	89	88	91	0.002
	6-12	90	83	95	95	
	12-24	99	99	97	100	
HFCI	< 6	59	75	53	58	0.01
	6-12	47	69	31	36	
	12-24	13	16	8	13	

CSD: Carbonated and non-carbonated sweetened drinks; HFS: High-Fat Content Snacks; HFCI: Consumption of fruits, vegetables + no CSD and no HFS; WHO criteria; NED: Not enough data.

Survey in children 0 to 4 years old.[25] Including the prevalence of possible risk of overweight, they are higher than the 23% OW and OB reported among 3 year old children in the Millennium Cohort Study conducted in the UK.[26] The prevalence of OW and OB among 2 to 5 years old children at the NHANES (2003-2004) study was 40%, among non-Hispanic Whites and in non-Hispanic Blacks it was 37%, and among Mexican-Americans it was 52%,[27] consistent with the 42% observed in this study among younger children. The observed trend of obesity in this study, from the first 24 months of age, indicates that the prevalence of obesity in Tuxtla and Reynosa is higher at 2 to 5 years of age than that in non-Hispanic Whites and non-Hispanic Blacks in the USA, and the prevalence in Tijuana would be higher than the observed high prevalence among Mexican American children 2 to 5y old.[27] The risk of OW and OB at this age group was not associated with the mothers' obesity. These results suggest that environmental factors within the family and the community, after birth, might have a greater effect on the development of childhood obesity on this low-income population than the mothers' BMI. A higher risk of obesity was observed in formula fed children, children consuming CSD, HFS, juices, families having a monthly income higher than 600 dollars, families with more than 12y of education, and children with mothers born out of the residence state (Table 3). Additionally, family income, education and migration were associated with higher risk of OW and OB, and higher consumption of fruits and vegetables. In another study conducted in Mexico, it was observed that the risks of OW and OB among school-aged

Table 3. Odds of overweight and obesity, weaning before 6 months, and demographic variables

Odds	OR (95% CI)	*p*
BMI z-score >2 (dependent variable)		
Mothers being obese (BMI ≥25 kg/m^2)	1.06 (0.73-1.54)	0.77
Breastfeeding (z-BMI >2)	0.57 (0.34-0.98)	0.04
Weaning ≤6 vs. ≥6 months	1.0 (0.5-1.99)	0.98
Consumption of HFS (≥1 weekly)	1.91 (1.31-2.78)	0.001
Consumption of HFS adjusted by family income and migration	2.24 (1.32-3.78)	0.003
CSD (≥1 weekly)	1.62 (1.1-2.36)	0.012
Consumption of CSD adjusted by family income and migration	1.95 (1.15-3.32)	0.014
Consumption of HFS and CSD (≥1 weekly)	1.87 (1.28-2.72)	0.001
Consumption of HFS and CSD adjusted by family income and migration	2.23 (1.31-3.81)	0.003
Consumption of juices (≥1 weekly)	0.86 (0.41-1.84)	0.71
Weaning before 6 months of age (covariate)		
Consumption of HFS (≥1 weekly)	2.74 (1.67-4.68)	0.0001
Consumption of CSD (≥1 weekly)	2.42 (1.46-4.02)	0.001
Consumption of fruits and vegetables (≥7 weekly)	0.57 (0.32-1.01)	0.056
CSDHFS	2.90 (1.69-4.98)	0.001
Monthly household income (>600 dollars) (covariate)		
BMI z-score >2	2.63(1.48-4.68)	0.001
Consumption of HFS (≥1 weekly)	1.05 (0.67-1.65)	0.82
Consumption of CSD (≥1 weekly)	0.77 (0.48-1.23)	0.27
Consumption of fruits and vegetables (≥7 weekly)	5.4 (3.15-9.4)	0.0001
CSDHFS	1.05 (0.67-1.65)	0.82
Education (>12 y)(covariate)		
BMI z-score >2	1.82 (1.12-2.97)	0.02
Consumption of HFS (≥1 weekly)	0.72 (0.51-1.03)	0.07
Consumption of CSD (≥1 weekly)	0.74 (0.51-1.07)	0.11
Consumption of fruits and vegetables (≥7 weekly)	1.78 (1.18-2.72)	0.007
CSDHFS	0.73 (0.52-1.04)	0.08
Migration (migrant to the state of residence) (covariate)		
BMI z-score >2	2.32 (1.60-3.39)	0.0001
Consumption of HFS (≥1 weekly)	1.24 (0.94-1.65)	0.13
Consumption of CSD (≥1 weekly)	0.89 (0.67-1.18)	0.43
Consumption of fruits and vegetables (≥7 weekly)	3.13 (2.22-4.42)	0.0001
CSDHFS	1.10 (0.84-1.46)	0.47

OR: odds ratio; CSD: Carbonated and non-carbonated drink; HFS: High fat containing snacks; CSDHFS: Consumption of CSD+HFS and no fruits, vegetables

children were positively associated with the mother's schooling, her socio-economic level and the schoolchild's age.[28] Likewise, in Baja California and Tuxtla, OW and OB was slightly higher among school age children attending private schools.[1,2,29] Studies in Latin America have reported obesity risk factors among 6 to 12 year old children.[30,31] Among Mexican school age children it has been reported that independent predictors of OW were: having first-degree relatives with obesity, sedentary lifestyles, being the third child or younger and female gender.[30] Additionally, the mothers' OW, the parent's constant limitation on the foods consumed by the child, and frequent snack consumption has been reported in Brazil to be associated with childhood obesity.[31] To our knowledge, this is the first study analyzing the prevalence of obesity and risk for obesity among very low and low-income Mexican infants and toddlers living in different regions of Mexico. Although in this study it is shown that children from higher income families, with higher levels of education and from migrant parents have more OW and OB, the population assessed came from very low-income families. That difference might not be shown when higher income families are included. The fact that the mother's weight status is not associated with obesity among these children suggests that food practices and physical activity during the first 24 months of life might be a risk factor of childhood obesity in genetically susceptible children. Later, during pre-school and school years, childhood obesity association with the mothers' BMI might be evident, indicating that environmental factors within the family are already relevant during this period of rapid growth and development. It has also been suggested that the intercultural US-Mexico relation in the border might be an additional environmental factor for the increasing incidence of OB; however, the results observed in Tuxtla indicate than other environmental factors might be more important. High exposure to (CSD) sweetened drinks and HFS in television advertising, food availability, and the cost of healthy foods, such as fruits and vegetables, must also be considered.[32]

Breastfeeding and Weaning

Breastfeeding was shown to be protective against OW and OB (z-BMI ≥1 and ≥2), while introducing other foods before 6 months of age did not shown to be significant. However, weaning before 6 months was shown to be a risk factor for consuming (CSD) sweetened drinks and HFS (Tables 1 and 3). The effect of breast-feeding on childhood obesity is controversial.[33,34] In Sweden, maternal education was shown to be a significant predictor of breastfeeding duration.[35] In another study, no association was found using the linear regression model; however, in

the logistic model, a significant association was observed for obesity.[36] Thus, Beyerlin suggested that the detection of the association between breastfeeding and childhood body composition might be related to the coding of the response variable and the statistical method used.[37] In this study we used binary and multinomial logistic regressions. In the UK Millenium Cohort Study, a prospective study that examined risk factors of overweight in 3 year old children found that introduction to solid foods < 4 months was associated with OW and OB, while breastfeeding ≥4 months was associated with a decreased risk.[26] Likewise, Sloan et al., observed that infants weaned early were heavier at 7 and 14 months, and gained more weight between 8 weeks and 14 months.[37] Although in this study the early introduction to solid foods was not associated to OW and OB, the introduction of CSD and HFS was associated with OW and OB, and weaning before six months of age was a risk of having more CSD and HFS (Table 3). Thus, indicating the high risk effect for obesity resulting from weaning before 6 months of age and introducing CSD and HFS to infants.

Food consumption

Several authors have suggested that early life is the time when dietary practices are established, and the type of foods introduced might model food habits that will continue throughout childhood.[38-40] Therefore, one of the most alarming results observed in this study is the early introduction of CSD and HFS (Table 2). This study shows that the introduction of high-energy content foods presented higher risks for obesity than breastfeeding, weaning or maternal BMI. Likewise, they indicate that early weaning might result in early introduction to high-energy density foods, which may cause rapid infancy weight gain.

These results are similar to those observed in the Feeding Infants and Toddlers Study (FITS).[20,41] In the FITS, Hispanic infants who were 4 to 5 months were more likely than non-Hispanics to be eating pureed baby foods on a daily bases,[20] and less likely to eat infant cereals and baby food vegetables; and among 6 to 11 month olds, Hispanics were more likely to be eating fruit-flavoured drinks and baby cookies.[20] Additionally, the percentage of children who ate snacks increased with age, and more than 90% of Hispanic children consumed an afternoon snack.[41]

On the other hand, in our study, years of education, household income, and migration were shown to be associated to consumption of fruits and vegetables. This data suggest that the cost and availability of food, as well as other cultural contingencies, could contribute to both the consumption of fruit and vegetables and OW and OB (Table 3).

The limitations of our study were that 1) this is a cross-sectional study, 2) the reliability of the questionnaire was conducted only in Tijuana, thus, as a result of cultural difference, the reliability might be different in other cities 3) the training of the students were conducted separately, 4) this is a convenient sample of women attending a vaccination center where most of the patients have low-income and are not eligible to receive formal health care services, and 5) the study was conducted in only three cities of Mexico. Therefore, the results warrant further and broader studies in a representative sample of different regions and states of Mexico, including qualitative studies that show causes of the infant and toddler feeding practices. Overall, the results of this study are alarming since early weight gain in the first 1-2 years of life is associated with later adverse health outcomes, including obesity and insulin resistance.[7,40]

In conclusion, the prevalence of possible risk of overweight and obesity increases with age, It jumps from 25.8% in infants younger than 6 months to 50.5% in those older than 12 months; the study shows that the introduction of high-energy dense foods propose a higher risk for obesity than breastfeeding, weaning, or maternal BMI; weaning before 6 months was shown to be a high risk for consuming CSD and HFS. These results indicate that prevention programs must be initiated during pregnancy and the first years of life, focusing on environmental factors within the family.

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AUTHOR DISCLOSURES

No conflict of interest.

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Original Article

Infant and toddlers' feeding practices and obesity amongst low-income families in Mexico

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墨西哥低收入家庭中嬰兒與學步幼兒的哺餵與肥胖之研究

本篇研究目的在找出墨西哥三個城市的低收入家庭中，嬰兒與學步幼兒的肥胖危險因子。這是一個橫斷性研究，在三個基層醫療診所(Tijuana、Tuxtla 及 Reynosa)，招募前來疫苗注射中心的母親及其嬰兒與學步幼兒為對象。母親及嬰幼兒於診所進行體位測量，並且訪談母親完成一份問卷。計 810 位母親及其 5-24 個月齡的嬰幼兒參與了這個研究。母親的平均年齡為 24(21-28)歲，其中有 57%為過重或肥胖。孩童的平均年齡為 12.7(5-24)個月齡。這些孩童中，整體的過重盛行率為 11%，及 8%為肥胖，且盛行率隨年齡增加而上昇。月齡小於 6 個月的過重和肥胖盛行率，分別為 3%和 6%；幼兒月齡介於 12-24 個月的過重和肥胖盛行率，則增為 13%和 10%。其中有 35%的嬰幼兒哺餵母乳超過 6 個月，而有 92%的嬰幼兒在 6 個月齡前就餵食固體食品。孩童月齡 6 個月前即開始接受高脂肪含量點心及碳酸或非碳酸含糖飲料；有超過 60%月齡 12-24 的幼兒，至少一個星期攝取一次高脂肪含量點心及碳酸或非碳酸飲料。攝取一個星期超過一次點心及碳酸或非碳酸飲料與過重或肥胖相關，粗勝算比為 1.82(95% CI= 1.24-2.65; p=0.002)。根據這些結果，建議應該進行預防性方案，始於懷孕期及繼續至哺餵期。

關鍵字：嬰兒肥胖、哺餵方式、母乳哺餵、斷奶、遷徙