Behavioral and normative beliefs that influence Mexican consumers to purchase packaged food in urban supermarkets

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Abstract

Objective. To identify the behavioral and normative believes factors that might have major influence on the decision to buy packaged foods in urban Mexican families. **Materials and methods.** We performed a cross-sectional study in four urban cities of Mexico. Participants responded a self-administered questionnaire (n=3 340) outside of randomly selected supermarkets. A factor analysis was performed to identify what were the main behavioral and normative believes explaining consumers' decision when buying packaged foods. **Results.** Three factors explained the behavioral beliefs: the quality assessment of packaged foods explained 61% of the variance, products that maintain weight explained 25%, and the emotional experience with foods explained 13%. Three factors explained the normative beliefs: expectations of children and partner explained 46% of the variance, expectations from the participants' closest friends 23%, and expectation from other family members explained 14%. **Conclusion.** Behavioral and normative beliefs related to assessing the quality of foods and meeting family expectations respectively are the main beliefs factors affecting consumers' packaged food purchase decisions in urban consumers.

Keywords: consumer behavior; food preferences; food selection; food quality; Mexico

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Resumen

Objetivo. Identificar las creencias de comportamiento y normativas que tienen mayor influencia en las decisiones de familias urbanas en México para comprar alimentos empaquetados. **Material y métodos.** Se realizó un estudio transversal en cuatro ciudades urbanas de México. Los participantes respondieron un cuestionario auto-administrado (n=3 340) a la salida de los supermercados que fueron seleccionados aleatoriamente. Se realizó un análisis factorial para identificar los principales factores de las creencias de comportamiento y normativas que explican la decisión de comprar alimentos empaquetados. **Resultados.** Tres factores explicaron las creencias conductuales: la evaluación de la calidad de los alimentos empaquetados explicó el 61% de la varianza, productos para control de peso explicaron el 25% y la experiencia emocional con los alimentos el 13%. Tres factores explicaron las creencias normativas: las expectativas de la pareja e hijos explicaron el 46% de la varianza, las expectativas de amigos cercanos el 23% y las expectativas de otros familiares explicaron el 14%. **Conclusión.** En las creencias conductuales, la evaluación de la calidad de los alimentos y en las creencias normativas, la expectativa de la pareja y los hijos tienen gran influencia en la decisión de compra de alimentos empaquetados en los consumidores de los supermercados urbanos en México.

Palabras clave: preferencias alimentarias; comportamiento del consumidor; toma de decisiones; cultura; México

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In the last two decades the epidemiologic profile of Mexico has changed from undernutrition and infectious diseases to obesity and other related noncommunicable diseases.[1] According to the latest *Encuesta Nacional de Salud y Nutrición* (Ensanut), the prevalence of overweight (body mass index (BMI) >25 kg/m^2) in adults increased from 21.1%[2] in 2006 to 39.5% in 2018.[3] The increase of obesity rates is mainly attributed to the excessive consumption of ultra-processed foods, and the lack of physical activity, under an environment where eating healthy foods and spaces for improving mobility are challenging.[4-6] The Mexican epidemiological context is burdensome, data of national health surveys has shown that the incidence of obesity has not slowed down throughout the years, despite several government interventions.[7]

The current obesity and diabetes rates in Mexican adults and children is related to changes in the way people purchase foods. In the 1990s, particularly after the North American Free Trade Agreement coming into effect, foreign and national food retailers (here after, supermarkets) brands began to expand to all major cities in Mexico, reaching growing numbers of consumers from all socioeconomic groups; and with presence in most of Mexico's major cities.[8] In 2016, a survey conducted by Nielsen showed that 74% of Mexicans enjoyed buying groceries in supermarkets, compared to the global average where only half of respondents preferred to make their purchases in supermarkets, rather than in small local stores or street markets.[9] Supermarkets tend to offer a greater variety of packaged food, and ultra-processed foods, which are linked to increased risk to several noncommunicable diseases (NCDs) if consumed regularly.[10]

Given the trends of NCDs in Mexico, particularly obesity and diabetes, and after multiple calls from health advocates and experts, in 2013 the government started a few regulatory strategies to control obesity and diabetes, as part of the National Strategy to Prevent and Control Overweight, Obesity, and Diabetes.[11,12] This strategy included several regulatory changes to improve consumers' choices when purchasing foods, such as restrictions on marketing foods to children, a front-of-pack labeling strategy, and a tax to sugar sweetened beverages (SSBs), and to junk food. Despite the efforts, in 2016 the country was declared to be in an epidemiological emergency. After the new president took office, in October of 2020, a new front of package labelling strategy to improve the former one, was implemented.[13] Products high in energy, sodium, sugar, saturated fat, and trans-fats were to be marked with black octagons indicating the consumers they are a major source of energy and unhealthy nutrients.

Changing eating behaviors and patterns of populations is not an easy task. Understanding factors that influence food choices is relevant to further design and implement strategies that would help to drive people's choices to healthier ones.[14] Nowadays, the excessive availability of ultra-processed packaged foods at supermarkets drives consumption towards unhealthy diets. Therefore, it is quite important to understand factors that influence people's decisions when buying packaged-foods, including ultra-processed foods.[15]

The theory of planned behavior offers an appropriate conceptual framework to look into factors that influence people's choices. It considers three dimensions: 1) behavioral beliefs (attitude), related to the individual´s perceptions about the potential consequences of one's behavior; 2) normative beliefs (subjective norm), related to the individual's perception of peer or social pressure or the individual's motivation to please others individuals as the motivation of a particular behavior; and 3) control beliefs (perceived behavioral control) are related to the individual's perception and hedonistic beliefs that may facilitate or hinder a behavior.

In relation to food choices, behavioral beliefs come from the individual's perceptions about specific food products. For instance, the perceived likelihood that certain food will have the expected outcome (e.g. flavor, nutrients, etc,); and the individual's subjective evaluation of the risks and benefits of consuming certain food.

Normative beliefs consider the social rules, traditions, values, trends, taboos, and advertised products, etc. These characteristics of some sociocultural collective units like families vary between them because some rules are forbidden or are unacceptable among others and result in social pressure.[16] They play an important role in regulating social behaviors and decision-making processes when buying foods.

Behavioral beliefs, include hedonistic factors. Many studies explored the relationship between food choices and hedonism. This feature does not determine what people eat, but explains why people make certain food choice and consider taste, flavor, satiety, hunger, comfort, enjoyment, among other feelings that please the individual.[17,18] Research has shown that even when consumers know their food choices are unhealthy, they often find it difficult to resist habitual pleasures that certain foods they choose provide.[18] Nevertheless, consumers have become increasingly aware of the relationship between the type of foods included in their diet, and the potential harms or benefits to their health. Although there is a lack of knowledge about how the nutrition information is used in different consumer groups, it has been cross-culturally described that women, parents of children living at home, and older consumers use

nutrition information to make food choices.[19-21] Several reasons could explain why consumers reacted differently to negative nutrition attributes versus positive ones. Attribute framing theory suggests that individuals may have more favorable evaluations of attributes (e.g. nutrients) when described positively than when described negatively.[22]

Research addressing normative beliefs that influence food choices is scarce. The evidence available considers mainly two type of norms: 1) injunctive norms that describe the individual's perception of what other people think they should do in a given situation; and 2) descriptive norms that describe individual's perception of what most people actually do in a given situation.[16] It also differs in terms of the social unit that the constructs represent, varying from the self to others, such as family, friends or society. Previous studies also suggest that the family is the most important social group to influence the eating behavior of children, adolescents and parents.[23]

Considering this framework, the present paper aims to identify the behavioral and normative believes factors that might have major influence on the decision to buy packaged foods in urban Mexican families. Understanding such factors will provide background for researchers and policy makers to strengthen nutrition interventions in Mexico that address obesity and diet related non-communicable diseases.

Materials and methods

Study design

We developed a cross-sectional study in four urban cities of Mexico from June to September of 2015.

Sampling selection

We used a multistage sampling method to apply the questionnaire. First, we selected the largest and most populated cities of the country (Mexico City, Guadalajara, Monterrey and Querétaro).[24] Then, we used a list of all supermarkets in each city as our sample frame. The stores were mapped using a geo-reference system to determinate location through a geo-statistical area reference (AGEBs by its acronym in Spanish). AGEBs are specific and delimitated urban areas with an average of 25 000 inhabitants or more, and are used to locate specific sociodemographic conditions such as living, commercial, industrial usage, among others. They are a proxy estimation of the sociodemographic characteristics of areas in each city. The supermarkets in each AGEB were randomly selected (without replacement) and proportional to the distribution of three levels of marginalization (low, middle, and high) defined by the *Instituto Nacional de Estadística y Geografía* (INEGI). A total of 14 supermarkets were selected in each city. Then we interviewed consumers when exiting the store from Tuesday to Sunday from 8 am to 6 pm from June to September. The sample was estimated with a significance level (alpha) of 0.50 (5%), a 20% of power and a 50% prevalence considering a design effect of 2 in a simple randomized sampling. A total of 840 questionnaires were estimated per city, with a total of 3 360 participants in the four cities. Participants' sampling was random with replacement.

Questionnaire design and validation

The theory of planned behavior and the food choice questionnaire developed by Steptoe and colleagues[25] were considered to design a self-applicable questionnaire. It explored behavioral and normative beliefs when selecting and buying foods. We included questions to explore behavioral beliefs that are related to an individual's perception to produce a favorable or unfavorable attitude towards food's selection. We also included questions to explore normative beliefs that are the individual's beliefs about others (e.g. family, friends, partner) expectations were when he / she usually selects or buys food.

The questionnaire included sociodemographic information (sex, age, marital status, degree of study, occupation) and characteristics of consumers related to food purchase (frequency of grocery shopping, number of children, number of people living at home, weight and height). Statements were created to assess behavioral beliefs (25 items); these items explored the quality of products, perceived rewards, and nutritional content. Responses were based on Likert scale (1= not important, 2= little important, 3= moderately important, 4= important and 5=very important). Additionally, 24 statements were created to assess normative beliefs such as: the influence of family, children, partner, and friends. All responses were also based on a Likert scale (1= totally disagree, 2= moderately disagree, 3= neither agree nor disagree, 4= agree, and 5= totally agree). Our questionnaire was designed and revised by a group of experts and piloted to check for internal consistency. The pilot test was performed with urban adult participants (n=80). The piloted questionnaire was applied outside four supermarkets in Mexico City. Language and length were adjusted after the pilot test. To evaluate internal coherence, the statistic test Alpha Cronbach was used; a Cronbach's Alpha of 0.69 was obtained for behavioral beliefs and 0.81 for normative beliefs.

Questionnaire application

The questionnaire was self-administered outside of supermarkets to participants who agreed to participate. The first questionnaire was applied to the first buyer exiting the supermarket at 8 am or minutes later, the next questionnaire was applied fifty minutes after, this procedure was iterative until completion of 10 questionnaires per day per supermarket. Before recruiting participants, the fieldworkers asked for the permission of the supermarkets' manager; then, they approached buyers exiting the store to invite them to participate. They gave participants the objective of the study, methodology, and estimated time of completion, and if they accepted, they got their oral informed consent. When the buyer did not want to participate in the study, the fieldworker looked for a replace (the next buyer exiting the supermarket).

Analysis

We performed a descriptive analysis of the sociodemographic variables and characteristics of consumers with their confidence intervals (CI95%). To identify the behavioral and normative beliefs factors that have a major influence in purchasing food we performed an exploratory factorial analysis. To retain factors, we considered those that have an eigenvalue >1 on scree plots, then items for each retained factor were screened to identify those with a factor loading >0.4. After that, we applied an orthogonal rotation. To evaluate the pertinence of the model a post estimation with the Kaiser-Meyer-Olkin test was performed, values under 0.5 indicated the factorial analysis did not fit the data. After that, we estimated internal coherence for each factor and performed an Alpha of Cronbach, values over 0.7 were considered with good internal coherence. Finally, we estimated behavioral and normative factor by terciles in order to identify the differences or similarities in the decision to buy packaged foods according to the sociodemographic characteristics of the population and applied Chi^2 test to compare between terciles. Data analysis was performed using Stata Version 14.

The research project from which this article derives was approved by the ethics commission of the *Mexican National Institute of Public Health* Instituto Nacional de Salud Pública (INSP) in February 2014 under folio 1153.

Results

A total of 3 163 participants completed the questionnaire (estimated sample 3 264). In Mexico City we obtained 25.7% (n=812. CI 0.24,0.27) of the sample, in Guadalajara 23.6% (n=746, CI 0.22,0.25=), Monterrey 24.6% (n=778, CI 0.23,0.26), and Queretaro 26.2% (n=827, 0.25,0.28). The majority of participants were women 69.6% (n=2 201, CI 0.68,0.71) and 30% were men (n=962, 0.29,0.32) (table I). According to the age, 52.8% (n=1 669 CI 0.51,0.55) were 31-60 years old; 37.5% (n=1 185 CI 0.36,0.39) were 18-30 years old, and the rest of the informants were older than 60 years old. Information collected about levels of education showed that people with no formal education were 2% (n=55, CI 0.01,0.02). Individuals with elementary school (primary and secondary education) represented 44.0% of the sample (n=1 232, CI 0.37,0.41), those with high school education represented 24.5% (n=684, CI 0.20,0.23), while 19.3% (n=827) attended a technical school or university. Regarding the occupation of the participants, the most common one was 'employee' with 38.6% (n= 1 277, CI 0.38,0.42) of the sample, followed by housewife with 33.0% (n= 1 044, CI 0.31,0.35).

Regarding to the socioeconomic status, 40.3% (n=1 410, CI 0.43,0.46) of the participants belonged to high socioeconomic level, 29.8% (n=933, CI 0.28,0.31) to medium level, and 25.9% (n=820, CI 0.24,0.27) to the low socioeconomic level. Almost 35.6 % (n=1 126, CI 0.34,0.37) of the participants fell into the normal weight category, 38.79% (n=1 227, CI .37,.41) was classified as overweight and 22.51% (n=712, CI .21,.24) were classified as obese. The majority of the participants (38%, n=1 201, CI: 0.36,0.40) bought food almost once a week, and 17.6% (n=557, CI 0.16,0.19)) two or three times a week. In addition, 37.9% (n=1 200, CI 0.36,0.40) of participants reported not having children, while almost 62% (n=1 963, CI 0.60,0.64) reported to have one or more children.

Behavioral beliefs

The first factor (table II) was integrated by eleven statements (4,5,7,8,9,10,13,14,19,20 and 21) all of them were related to the quality assessment of food products and explained 61% (eigenvalue 5.84) of the variance (Alpha de Cronbach 0.85). The second factor was integrated by six statements (1,2,6,12,23 and 24), all of them were related to maintain weight and explained 25% of the variance (eigenvalue 2.41, Alpha de Cronbach 0.81). The last factor was integrated by four statements (16,17,18 and 22), the factor was called emotional experience, since it integrated items related to emotions, it explained 13% of the variance (eigenvalue 1.23, Alpha de Cronbach 0.69). Post estimation testing of factor analysis got an overall of 0.8954.

Table III shows factor analysis by terciles. For the first factor (Quality assessment), differences were found by city, age, marital status, education, occupation, and socioeconomic level. For the second factor (Health Issues),

Table I
Sociodemographic characteristics of consumers recruited at urban supermarkets. Mexico, 2015 (n=3 163)

	Frequency	%	*CI95%*
Mexico City	812	25.6 (24-27)	
Guadalajara	746	23.5 (22-25)	
Monterrey	778	24.6 (23-26)	
Querétaro	827	26.1 (25-28)	
Sex			
Male	962	30.5 (29-32)	
Female	2 201	69.5 (68-71)	
Age			
18-30	1 185	37.5 (36-39)	
31-60	1 669	52.8 (51-55)	
61-85	309	9.8 (9-11)	
Marital status			
Single	1 150	34.0 (32-36)	
With couple	1 857	54.8 (53-57)	
Other	379	11.2 (10-12)	
Education			
No instruction	55	2.0 (1 - 2)	
Elemmentary school	1 232	44.0 (37-41)	
High school	684	24.4 (20-23)	
Undergraduate degree	827	29.6 (25-28)	
Other			
Occupation			
Employee	1 277	40.4 (38-42)	
Salesman	215	6.8 (6 - 8)	
Housewife	1 044	33.0 (31-35)	
Other	627	19.8 (18-21)	
Socioeconomic level			
High	1 410	44.3 (43-46)	
Medium	933	29.8 (28-31)	
Low	820	25.9 (24-27)	
BMI (according to weight reported by participants)			
Low	98	3.1 (3 - 4)	
Normal	1 126	35.6 (34-37)	
Overweight	1 227	38.8 (37-41)	
Obesity	712	22.5 (21-24)	
Frequency of consumption			
Every day	232	7.3 (6 - 8)	

BMI: body mass index

differences were found by city, sex, education and socioeconomic level. For the third factor, differences were found by city, sex, education, occupation, socioeconomic level, BMI, frequency of consumption and having children.

Normative beliefs

Factorial analysis about normative beliefs showed that the first factor was integrated by eight statements (1-8) related to children and partner expectations and it explained 46% (eigenvalue 4.88, Alpha de Cronbach 0.87).) of the variance (table IV). The second factor was integrated by five items (9-13) related to friends' expectations and explained 23% (eigenvalue 2.45, Alpha de Cronbach 0.80) of the variance. The third factor was integrated by four statements related to the consumer's family expectations and explained 14% (eigenvalue 1.41, Alpha de Cronbach 0.74) of the variance. Regarding the cumulative variance, two factors explained 70% of the variance, and three factors 84% (Table III). The post estimation testing of factor analysis got an overall of 0.8151.

Tercil factor analysis shows statistically significant differences (table V). For the first factor (children and partner expectations) differences are shown by city, employment, socioeconomic level, frequency of consumption and having or not children. For the second factor (friends' expectation) differences are shown by city, age, marital status, education, socioeconomic level, frequency of consumption and having or not children. For the third factor, differences are shown by city, age, occupation, socioeconomic level, frequency of consumption and having children.

Discussion

Our results showed that the behavioral belief with the greatest influence on consumers' food choices was their assessment of the quality of foods. Likewise, the normative belief with the greatest influence on consumers' choices when buying foods were the expectations of their children or their partner.[26] This reveals the relevance of understanding key issues of behavioral change when addressing interventions to improve diets, and therefore health. Skewed assessments of food quality are likely to happen when information about the products, is not clear. Likewise, not only the consumer's beliefs are relevant, but what their social unit (or closest family) beliefs are. This study reveals the necessity of interventions that address behavior and normative beliefs influencing food consumption to fight obesity and diet-related non-communicable diseases.

Similar studies looking into behavioral beliefs, have shown the relevance of understanding the consumer's

Table II

EXPLORATORY FACTOR ANALYSIS OF THE BEHAVIORAL BELIEFS OF FOOD CONSUMERS IN FOUR URBAN CITIES. MÉXICO, 2015

Number	*Statements*	*Factor name*	*Factor loadings*		
			1	*2*	*3*
4	They are healthy products for my family/kids/husband	Quality assessment	0.6		
5	They have pleasant smell and taste		0.6		
7	They are easy to get at the supermarket/store		0.4		
8	They are good for my skin/teeth/hair/nails		0.4		
9	They look good		0.6		
10	They are high in protein		0.4		
13	My family/kids/husband like them		0.6		
14	They are free of artificial ingredients (colorants, conservatives)		0.5		
19	They are good quality foods		0.7		
20	They are easy to digest		0.6		
21	They have fair price according to product quality		0.6		
1	They are labeled as "light"	Maintain weight		0.6	
2	They are low fat products			0.8	
6	They are low sugar products			0.7	
12	They help me control my weight			0.5	
23	They are low sodium products			0.6	
24	They are recommended by my doctor/nutritionist/health personnel			0.5	
16	They help me relax	Emotional experience			0.6
17	They are what I am used to eat				0.5
18	They are high in fiber				0.5
22	They remind me of the food I ate when being a kid				0.6

characteristics. For instance, how women consumers behave differently than men.[27-29] Commonly women, when bearing children, assume the responsibility of feeding and choosing foods for the household and family; and often assumes the primary responsibility for planning and preparing family meals.[30] In our study the majority of respondents were adult women and they reported to purchase what they believe are healthy food products. Previous research has shown adult women to be more responsive to purchase and consume healthy products compared to younger women.[31] On the other hand, evidence has shown that the lower the education level of the population, the decisions for purchasing healthier foods are worst than in higher educated groups.[26] Furthermore, overweight and obesity was reported as a factor that influence the decision to purchase the amount of energy and fat per person even when adjustments were made for number of children and adults living in each household.[32]

Regarding behavioral beliefs, the quality assessment of food products (first factor) explained many of the variance in the decision to buy packaged foods by the consumers, product quality is a dimension that is highly valued by consumers.[33] In our study the quality was assessed from a holistic perspective that included taste, nutrients, fair price, accessibility and presentation of the food product. Products that maintain weight (second factor) explained 25% of the variance, and there are similar findings in other studies.[34,35] On the other hand, emotional experience (third factor) was the factor that explained the smallest percentage of the variance. This factor included items related to diverse experiences like

Table III

Terciles of factors of behavioral beliefs by sociodemographic characteristics. Mexico, 2015

	Factor 1: Quality assessment			*Factor 2: Health issues*			*Factor 3: Emotional experience*		
	Tercile 1	*Tercile 2*	*Tercile 3*	*Tercile 1*	*Tercile 2*	*Tercile 3*	*Tercile 1*	*Tercile 2*	*Tercile 3*
City									
Mexico city	26.9	30.8	24.9 *	26.8	28.1	27.7 *	25.8	26.4	29.4*
Guadalajara	16.9	26.9	22.8	15.5	22.3	28.7	23.8	24.5	18.0
Monterrey	21.8	22.3	21.8	21.7	19.6	24.7	26.9	21.7	17.4
Queretaro	34.5	20.0	30.5	36.1	30.0	18.9	22.6	27.4	35.1
Sex									
Male	29.7	31.0	28.8	34.6	29.8	25.1 *	38.7	27.6	23.8*
Female	70.4	69.0	71.2	65.4	70.3	74.8	61.3	72.4	75.9
Age									
18-30	41.1	42.5	28.7 *	39.2	38.8	34.3	45.7	36.9	29.6
31-60	49.4	49.1	59.4	51.8	51.7	54.5	47.3	51.5	59.2
61-85	9.5	8.4	12.0	9.0	9.6	11.3	7.1	11.6	11.2
Marital status									
Single	35.0	38.9	28.1 *	32.7	34.7	34.7	39.3	35.2	27.4
With couple	46.1	41.3	53.5	48.0	44.4	48.4	44.2	45.1	51.6
Other	18.9	19.9	18.4	19.3	21.0	16.9	19.6	19.6	21.0
Education									
No instruction	1.3	1.9	1.6 *	1.7	1.8	1.3 *	0.6	2.1	2.1 *
Elemmentary school	43.9	34.3	37.0	43.8	42.0	29.3	29.8	37.3	48.3
High school	35.2	32.6	33.6	33.7	31.7	36.0	34.2	34.0	33.3
Undergraduate degree	18.5	29.5	25.2	20.4	22.8	30.1	32.6	25.1	15.5
Other	1.1	1.7	2.6	0.3	1.7	3.3	2.9	1.6	0.9
Occupation			*						
Employee	40.3	41.3	36.4	38.2	40.9	38.8	42.8	38.4	35.7*
Salesman	4.9	5.9	9.3	8.0	5.1	7.2	9.5	4.5	6.3
Housewife	37.0	28.6	35.5	33.2	34.9	32.9	22.3	36.1	42.6
Other	17.8	24.3	18.8	20.6	19.1	21.2	25.5	21.0	14.4
Socioeconomic level									
High	35.2	48.3	48.7 *	37.4	42.9	52.0 *	46.6	45.3	40.2*
Medium	33.2	32.6	24.4	26.3	30.8	33.0	24.0	21.7	32.2
Low	31.6	19.7	27.0	36.3	26.3	15.0	29.4	33.0	27.6
BMI									
Low	2.4	3.1	3.9 *	4.1	2.2	3.1 *	4.1	2.7	2.6 *
Normal	35.6	37.2	35.0	37.2	35.5	35.1	38.8	35.7	33.3
Overweight	38.6	36.1	42.0	39.4	37.3	40.0	38.1	38.2	40.3
Obesity	23.5	23.6	19.1	19.3	25.1	21.8	19.0	23.5	23.8
Frequency of consumption									
Every day	2.4	3.1	3.9 *	7.0	7.3	7.6	7.1	7.4	7.4 *
Once a week	35.6	37.2	35.0	37.7	40.4	37.4	35.6	40.8	39.5
Two or three times a week	38.6	36.1	42.0	16.5	18.7	16.9	17.1	15.1	20.0
Other frecuency	23.5	23.6	19.1	38.8	33.1	38.1	40.3	36.7	33.2
Children									
No children	38.4	44.2	33.6 *	38.4	37.7	40.1	48.7	39.8	27.5*
Children	61.7	55.9	66.4	61.7	62.3	59.9	51.3	60.2	72.5

* Chi^2 ($p< 0.05$)
BMI: body mass index

food reminders of their childhood, and that food helps them relax.[19]

Our results show how the normative beliefs of consumers' is a major factor influencing their decision when selecting foods, and how the individual's surrounding environment (husband and children) and relationships affect food choices.[30] The food**s** that the primary shopper chooses to buy and provide at home is an important determinant of family dietary patterns.[36,23] The woman wants to satisfy the family members expectations, food preferences and sometimes without no dietary restrictions.[32] Another theory, which supported the reason for why women choose food products considering the expectations of their close family members is because they tend to avoid the possibility of conflicts towards food and maintain family peace and harmony.[37] These might mean that nutrition education for the whole family would be an ideal strategy to improve healthy food choices in the household.

One strength of our study is that the questionnaire was self-administered, therefore, the interviewer did

Table IV

EXPLORATORY FACTOR ANALYSIS OF NORMATIVE BELIEFS OF FOOD CONSUMERS FROM URBAN SUPERMARKETS. MEXICO, 2015

No	*Statements*	*Factor loandings*			
		1	*2*	*3*	*4*
1	Kids: Products they like even if they aren't healthy	0.6			
2	Kids: Fashionable products	0.7			
3	Kids: Easy to prepare	0.7			
4	Kids: Products to share with their friends	0.5			
5	Partner: Products he/she likes even if they aren't healthy	0.6			
6	Partner: Products recommended on television or radio	0.5			
7	Partner: Easy to prepare	0.7			
8	Partner: Low cost products	0.5			
9	Friends: Products recommended on television or radio		0.6		
10	Friends: Products recommended by a doctor or a nutritionist		0.6		
11	Friends: Products suggested by a sales promoter in the supermarket		0.8		
12	Friends: Expensive products even if they aren't healthy		0.7		
13	Friends: High quality even if they aren't healthy		0.7		
14	Family: Cheap products have bad quality			0.6	
15	Family: Brands of known quality			0.7	
16	Family: Less healthy products are expensive			0.7	
17	Family: Less healthy products do not taste good			0.5	

Table V

FACTORS OF NORMATIVE BELIEFS ACCORDING SOCIODEMOGRAPHIC CHARACTERISTICS. MEXICO, 2015

	Factor 1			Factor 2			Factor 3		
	Tercile 1	Tercile 2	Tercile 3	Tercile 1	Tercile 2	Tercile 3	Tercile 1	Tercile 2	Tercile 3
City									
Mexico city	25.1	27.69	18.92*	17.53	23.31	30.88*	24.9	25.9	20.92*
Guadalajara	19.72	21.31	20.32	17.93	23.31	30.88	21.12	20.12	20.12
Monterrey	25.3	25.7	34.86	28.09	26.69	31.08	20.72	23.31	41.83
Queretaro	29.88	25.3	25.9	26.45	27.49	17.63	33.27	30.68	17.13
Sex									
Male	23.51	28.49	30.08	25.5	26.89	29.68	25.5	25.9	30.68
Female	76.49	71.51	69.92	74.5	73.11	70.32	74.5	74.1	69.32
Age									
18-30	20.92	22.51	24.9	23.9	20.72	23.71*	19.92	23.11	25.3*
31-60	72.11	69.92	69.92	70.72	74.1	66.53	70.12	71.51	70.32
61-85	6.97	7.57	5.18	5.38	4.58	9.76	9.96	5.38	4.38
Marital Status									
Single	3.78	4.98	6.97	1.99	5.38	8.37*	5.58	2.59	7.57
With couple	80.68	75.5	74.5	81.67	78.88	70.12	78.49	79.48	72.71
Other	15.54	19.52	18.53	16.33	15.74	21.51	15.94	17.93	19.72

(continues…)

(continuation)

Education									
No instruction	1.2	1	2.59	1.59	1.2	1.99*	1.59	1	2.19
Elemmentary school	46.61	48.61	50.8	55.38	39.64	51	51.59	45.02	49.4
High school	31.27	29.68	28.49	27.69	33.47	28.29	26.29	33.67	29.48
Undergraduate degree	20.52	20.12	16.53	13.94	24.9	18.33	19.72	19.12	18.33
Other	0.4	0.6	1.59	1.39	0.8	0.4	0.8	1.3	0.6
Occupation									
Employee	33.27	36.25	25.32*	37.65	40.44	36.85	32.07	35.45	46.41*
Salesman	9.16	6.97	6.57	8.37	9.16	5.18	5.78	7.77	9.16
Housewife	49.8	50	42.23	48.21	44.22	49.6	53.98	49.6	38.45
Other	7.77	6.77	5.78	5.78	6.18	8.7	8.17	6.18	5.98
Socioeconomic level									
High	40.84	49	33.27*	27.29	39.24	56.57*	47.81	38.45	36.85*
Medium	30.28	24.9	29.88	40.84	26.69	24.3	32.47	28.09	31.27
Low	28.88	26.1	36.85	37.87	34.06	19.12	19.72	33.47	31.87
BMI									
Low	1.79	0.6	1.39	1	1.59	1.2	1	1.3	1.59
Normal	32.07	29.08	27.09	30.08	28.88	29.28	28.88	30.68	28.69
Overweight	41.83	44.82	40.24	41.04	42.23	43.63	42.63	42.43	42.83
Obesity	24.3	25.5	31.27	27.89	27.29	25.9	27.49	25.7	27.89
Frequency of consumption									
Every day	8.76	6.37	5.38*	7.17	5.18	8.17*	5.98	7.57	6.97*
Once a week	34.86	46.22	34.66	33.86	34.46	47.41	49.4	37.05	29.28
Two or three times a week	20.12	18.33	19.72	18.73	23.31	16.14	16.93	23.31	17.93
Other frecuency	36.25	29.08	40.24	40.24	37.05	28.29	27.69	32.07	45.82
Having children									
No children	2.59	3.19	8.17*	2.99	3.98	6.97*	1.79	4.58	7.57*
Children	97.41	96.81	91.83	97.01	96.02	93.03	98.21	95.41	92.43

* Chi^2 ($p< 0.05$)
BMI: body mass index

not influence the participants with their voice or facial expressions. However, this study might be object of some limitations. Due to the length of the questionnaire, some respondents might answer without understanding the questions; however, we believe that this error is not differential. On the other hand, the analysis did not include some variables related to special diets of the family such as chronic diseases and we are aware that those conditions might influence behavioral and normative believes.

Conclusions

Our results show how that for urban consumers in Mexico one of the main behavioral believes influencing food choices when buying products is the consumer's assessment of the quality of foods. One of the main normative beliefs influencing food choices is the expectations of family members (partner and children). These findings highlight the relevance of targeting interventions to improve diets to both primary shoppers, mainly adult women; and children. Consumers' family, in particular children's perception and expectations are a major driver of food selection. Expectations of the partner and children need to be considered when designing programs and policies aimed to change consumers' behavior towards achieving healthy diets. Policies and programs need to offer precise, easy to understand, and reliable food information to help consumers select healthier food products; and therefore, reduce obesity trends in the country.

Declaration of conflict of interests. The authors declare that they have no conflict of interests.

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