


Childhood obesity in Mexico: A critical analysis of the environmental factors, behaviours and discourses contributing to the epidemic

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Abstract

Mexico has the highest prevalence globally for children who are overweight. We conducted a qualitative study to understand childhood obesity in Mexico and the complex factors at play. Data were collected at three elementary schools in a low socio-economic area in Mexico City. Semi-structured interviews were conducted with 60 children, 24 parents and 28 teachers. The children interviewed were between the ages of 8 and 12 years old. Interview texts were analysed using NVivo 9 and 10 and thematic discourse analysis was used. Findings revealed how children's choices around nutrition and physical activity were constrained by their environment and discursive constructions.

Keywords

behaviour, children, environment, Mexico, obesity, obesogenic, thematic discourse analysis

Introduction

Obesity is a major health challenge in Mexico (Bonvecchio et al., 2009; DiBonaventura et al., 2018). It is currently the second most obese country in the world and researchers predict that in 2030, 39% of the population will be obese (OCED, 2017). Studies suggest that obesity affects all economic groups in Mexico and is increasing in low-income and high-income populations (Del Río-Navarro et al., 2004; Ruiz-Arregui et al., 2007). Furthermore, the World Health Organization (2016) reports that Mexico experiences the highest prevalence globally of children who are overweight or obese. Upward trends in obesity in school-aged children and adolescents have been observed at a national level, as well as in all subpopulations in Mexico (Bonvecchio et al., 2009; Del Río-Navarro et al., 2004; Fernald and Neufeld, 2007).

Obesity is a precursor to a number of diseases, which have important long-term individual and social consequences. Obesity is typically comorbid with heart conditions, hypertension, diabetes type B, cancer or sleep apnea (DiBonaventura et al., 2018; Kopelman, 2009; Perichart-Perera et al., 2007). In addition, research indicates that

obesity in children and adolescents is directly associated with high blood pressure (Flores-Huerta et al., 2009; Perichart-Perera et al., 2007). Obese individuals are also at increased risk for depression and lower levels of quality of life (DiBonaventura et al., 2018). Obesity also leads to negative labour market outcomes and health costs for the state (OCED, 2017).

Mexico City represents an emerging economy and has grown from 1.6 million in 1940 to 14.8 million in 1990, as people move from rural areas to urban areas in search of work (Arredondo, 2007). The current population of the city is estimated at around 20 million. The rise in the rates of obesity in Mexico City has been linked to the increased

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consumption of sugar products and calorie-dense foods and beverages, as well as a more sedentary lifestyle (Arredondo, 2007; Barquera et al., 2010; DiBonaventura et al., 2018). Migration to urban areas is often associated with eating a more Western-type diet high in fat and refined sugar and less physical activity (Arredondo, 2007).

Interventions aimed at reducing rates of obesity in Mexico are typically centred on individual food choices and improving exercise habits through lifestyle changes (Cecchini et al., 2010; Jiménez-Cruz et al., 2006; Martínez-Andrade et al., 2014). Many of these interventions fail because they ignore the environmental influences on food intake and physical activity and neglect to look at social relationships (Christakis and Fowler, 2007; Egger and Swinburn, 1997). Research suggests the driving force for the prevalence of obesity in children is the obesogenic environment rather than any 'pathology' in metabolic defects or genetic mutations within individuals (Egger and Swinburn, 1997; Mazzocchi et al., 2009). Therefore, a paradigm shift is needed to understanding childhood obesity as a result of a pathological environment (Egger and Swinburn, 1997). Furthermore, experts suggest that obesity is caused largely by an environment that promotes excessive food intake and social norms regarding the acceptability of obesity and discourages physical activity (French et al., 2001; Hill and Peters, 1998; Kopelman, 2000; Cohen-Cole and Fletcher, 2008). For example, studies show that children's physical activity can be affected by how active their parents are and parents can influence their children's eating behaviour by modelling good eating behaviours (Anderson and Butcher, 2006; Brown and Ogden, 2004; Rhee, 2008). This highlights the importance of children's social relationships and the family environment. The observation that individuals are embedded in different social relationships and environments highlights the necessity of approaching obesity not only as a clinical problem but also as a public health problem (Christakis and Fowler, 2007; Cohen-Cole and Fletcher, 2008).

A recent intervention by the Mexican government, which took into account macro-environmental factors was the introduction of taxes on sugar-sweetened beverages of about 1 peso (US\$0.06) per litre (Aceves-Martins et al., 2016), which is important in light of recent research documenting the increased consumption of calorie-dense beverages among pre-school and school children in Mexico (Barquera et al., 2010). Along with research on environmental influences on obesity, there is a need for partnerships among key institutions in society, such as public health agencies, communities, government, health organizations, the media, the food and health industry and advocacy organizations, in trying to address the obesity epidemic (French et al., 2001). Environmental changes, such as changing how food is marketed, priced and made available, as well as changes to urban planning, will help stop the increasing trend of obesity (French et al., 2001).

In light of the literature surrounding obesity in Mexico and its possible causes and consequences, this study wanted to specifically explore how obesogenic environments and the social construction of food choices and physical activity, contributes to the childhood obesity epidemic in the country. The study explored the different ways physical activity is discouraged and inhibited in these children's environments, as well as how the children attribute meaning to the food they choose and their mealtimes.

Method

A qualitative study, consisting of semi-structured interviews, field observations and thematic discourse analysis, was conducted in three different government schools in Mexico City. The schools were selected by convenience sampling and were located in a low socio-economic area in Mexico City. We consciously chose public schools in low socio-economic areas because we wanted to study the problem of childhood obesity among the poor in Mexico City. Interviews were conducted between January and July 2012 and this study was part of a government health project at the Instituto Mexicano del Seguro Social (IMSS).

Within each of the three schools, one school grade (third through sixth grades) was randomly selected. The ages of the children ranged between 8 and 12 years old. Trained field personnel measured weight and height and computed each participant's z-score of body mass index (BMI), according to the World Health Organization criteria (Cole et al., 2000). From this distribution, we selected 60 children: 20 with the lowest BMI, 20 with the highest BMI, and 20 children with middle z-scores to include children with different weight. Trained members of the research team conducted semi-structured interviews with the selected children (60), 24 of their mothers and 28 teachers (22 classroom teachers and 6 physical education teachers). All the selected children, parents and teachers agreed to be interviewed. Participation was emphasized as voluntary and informed consent was obtained before the interviews began. After receiving information about the project's purposes and conditions, the children's parents signed a consent form for their child's and their own participation in the study. The project was approved by the ethics committee of the IMSS. Individual interviews were conducted at the schools with the teachers during school hours, and individual interviews with children and parents were conducted at their homes after school in the evenings.

The interview guides consisted of open-ended questions and were constructed according to the socio-ecological model of infant nutrition for each of the sub-samples: children, parents, teachers and physical education teachers (Pocock et al., 2009). Interviews probed the following topics: nutrition and physical activity; the children's different environments (home, school, and the street); and parents' and school teachers' behaviours in association with nutrition

and physical activity. The interview guide shifted according to the type of participant. The children's interviews focused on the children's daily routine, their mealtimes, their interactions with others, their experiences at school, what they did after school and on the weekends and their relationships with their parents. The parents' interviews focused on both the parent's and children's daily routine, their mealtimes, the parents' perceptions of physical education at the school and their relationship with their children. The physical education teachers' interviews focused on their daily routine, their mealtimes, and their experience with teaching the children about physical education and nutrition.

The language used in the interviews was adapted to fit the children's age and context. Technical jargon was avoided, and interviewers used local slang to make the children feel more comfortable. Senior researchers who had experience working with children helped interviewers script their interviews and rehearsed it with them. The interviewers and researchers kept field diaries with their observations about the behaviour of the children, teachers and parents as well as about the physical conditions of the schools and surrounding areas where the children live. These notes were important because they provided the researcher with valuable context regarding behavioural trends. All the interviews and field notes were audio recorded and analysed as free text using NVivo 9 and 10 (NVivo qualitative data analysis, 2014).

Interview texts were analysed using thematic discourse analysis. Thematic and discursive approaches are not mutually exclusive (Clarke, 2005; Taylor and Ussher, 2001; Wigginton and Lee, 2014). This method draws on the identification of themes and the importance of the discursive functions of these themes (Wigginton and Lee, 2014). In other words, it identifies themes in a text within a social-constructionist epistemology, focusing both on the rhetorical design and on the ideological implications of the themes (Clarke, 2005). This method pays attention to the constructive force of language and its ability to construct reality (Burr, 2003). Within social-constructionist epistemology, the relationship between the individual and social operate in both directions and the relationship between the individual and the objective social world is a continuous balancing act (Berger and Luckmann, 1966). Burr (2003) asserts that 'human beings continually construct the social world, which then becomes a reality to which they must correspond' (p. 185). Thematic discourse analysis is based on this premise.

The steps of this qualitative analysis were as follows: interview texts were read and re-read by the researchers. The researchers identified themes in the texts using a social-constructionist epistemology and identified the discursive functions of these themes. Once thematic discourses were identified, the relationships between these thematic discourses were discussed. A discourse is described as a system of statements that produce an object and represent a system of beliefs that produce a particular version of reality (Parker, 1992). The power relations that these discourses produced

were also explored (Parker, 1992). By using thematic discourse analysis, the researchers were able to understand the patterns of discursive constructions around food and physical activity. Attention was also paid to the environments in the participants' lives and how they may be linked to the way participants constructed meaning around food and physical activity. The analysis allowed for a critical and comprehensive discussion of the individual and social factors contributing to childhood obesity in Mexico City.

Results

The analysis revealed a network of discourses surrounding food and physical activity situated in three social environments: the home, the school and the street. This is discussed in detail following the description of the research sample below.

Description of the research sample

Of the total, 47% of the children were boys and 52% girls. Ages ranged from 8 to 12 years. Of the total, 51% of the children had a normal BMI, 24% were overweight, and 23.4% were obese. Mothers' ages ranged from 25 to 49 years. Only 4.1% had completed college and 7.6% completed high school. The majority (66%) had completed junior high school. Of the total, 52% of the mothers were employed and, of these, only 52% held formal jobs, whereas 27% were informally employed and 15.7% were local vendors. Almost all homes (98%) in the sample had electricity, running water, and sewage; however, 13% did not have bathroom facilities within their home. Electronic-domestic appliances were unexpectedly abundant, with 90% of the homes reported with a gas stove for cooking, a refrigerator, and a TV. Cellular phones were also very frequent (86.2%) and desktop computers as well (33.7%). The monthly income showed a central tendency (Mdn) of US\$300 (range: US\$60–US\$1500).

Discourses of food

Food as parental caring. Many of the participants constructed food as parental caring and a way to express love. Food was constructed as a way to reward children for certain behaviours and was used to manage the parent–child relationship. One of the children, Cinthia, speaks about how she is rewarded with junk food by her parents in the excerpt below.

- Interviewer (I): How often does it happen that they give you snacks as a reward?
- Cinthia (C): Almost every day.
- I: Every day. When you eat something you like, do you get the snack anyway?

C: Yes.
 I: Then, is it like your dessert?
 C: Yes.
 I: What do you get? What kind of snack do you get?
 C: Sometimes potato chips or a chocolate bar. Sometimes candy. All sorts of snacks.

Gustavo's mother also illustrates this discourse of food as parental caring in the excerpt below. The quote also highlights how food is often used to appease children.

Yes, on the weekends, I ask Gustavo: what do you want to eat? I cook what they want or on weekdays, the children or my husband asked to make something. If they want some dessert, when we go to the market, I ask them which fruit they want me to bring home.

Children as the decision-makers. In the interviews, children emphasize how they chose what they ate. Children were constructed by the teachers, parents and themselves as rational individuals who were capable of their own choices. They were positioned as the decision-makers and were constructed as able to make decisions related to nutrition and physical activity. This can be seen in the excerpt below.

Interviewer (I): If they serve you a plate of food and there is nothing but squash, what do you do?
 Daniela (D): I do not eat it.
 I: What do you eat?
 D: I take something from the refrigerator, warm it and eat it.

This emphasis on the independence of children and the child as being in control of their behaviour was a trend across the study. This may symbolize shifting parental trends in Mexico City, in which children are given increasingly more independence. The interviews revealed that food was chosen based on what the children wanted and convenience.

Food as convenience. Family mealtimes were often disrupted because meals either took place outside of the home or were interrupted by work or entertainment activities. In the excerpt below, a child illustrates this point when she states she goes out for dinner every night. In this context, the child, Patty, constructs food as an entertainment activity and a function of convenience.

Interviewer (I): Where do you go for supper?
 Patty (P): We go to eat tacos, pizza, burgers, or chicken wings.
 I: How often is that?
 P: Almost every day.

I: Every day? You go out for supper every day. Why don't you have supper at home?
 P: I don't know.
 I: Who is the one who wants to go out for supper?
 P: My dad and myself.

In the excerpt above, Patty mirrors the obesogenic behaviour of her father by going out every day to eat fast food. Food choices seemed to be centred on convenience for many of the participants. Fieldnotes revealed that this may be due to time constraints, which could be attributed to the heavy traffic in Mexico City, which makes commuting lengthy, as well as the increasingly demanding work schedules of many of the parents. This leaves children and parents with limited time to prepare nutritious food and participate in physical activity.

Permissive feeding styles. The interviews also revealed that the home is often characterized by permissive and indulgent feeding styles, in which the parent submits to the child's food choices. Food was constructed by both parents and children as a way to manage their relationships with each other. In the exchange below, a child being interviewed demonstrates this point.

Interviewer (I): Do you like soft drinks?
 José (J): Yes.
 I: Which do you drink?
 J: The apple-flavoured one.
 I: Do you order the small or the large size?
 José: Large size.
 I: Very well. What does your father say about you eating two burgers?
 J: He tells me that if I am hungry I should order another one.

The excerpt above is an example of how some parents in the study seemed unconcerned with their children's nutrition and constructed their children as responsible for their own food choices. Parents also seemed unaware of the risks associated with childhood obesity and seemed to condone the obesogenic behaviours of their children.

Parents as responsible for nutrition. Parents seemed to send their children to school with junk food, which thwarted the attempts by the school to stop selling junk food. This is again reflective of the permissive feeding styles identified. A physical education teacher explains this below.

Even though the school has limited snacks and even removed some snacks, there is still a lot of junk food. However, as I said, it is a lack of commitment from us, the parents, because as the children leave for school, parents buy these items for them or give them the money to purchase them.

(Physical education teacher)

The teacher in the excerpt above places the responsibility of nutrition on the parents but ignores other environmental factors, namely the influence of fast food and sugar companies in Mexico and the wide availability of this unhealthy food. However, fieldworkers noted that the nutritional information that the children receive from the schools was often incomplete and incorrect, and parents lacked sufficient knowledge around nutrition. This is illustrated below in one of the teachers' explanations regarding the children's lack of knowledge regarding nutrition.

- Interviewer: Have you addressed the topic of nutrition with the children, with your students?
- Tomás: Yes. But right now, I don't remember. I believe it was in the first or second Natural Sciences unit when learning about nutrition. Really, it is a bit difficult because it clashes with their habits regarding nutrition. Unfortunately, as I said, parents sometimes buy the children whatever they want to eat just to appease them. Usually, these are not nutritious foods or foods that their bodies really need.

In the excerpt above, the teacher emphasizes how often parents buy their children food as a way to 'appease' their children, demonstrating the prevalence of the discourse of 'food as parental caring', which is aligned with the trend of permissive feeding in the home. The teachers in the study commonly positioned parents as responsible for the health behaviour of the children and explained how their efforts to introduce healthy behaviour in the children were often thwarted by the parents. They avoided their own responsibility as educators and shifted blame onto the parents, which is an interesting observation as most of the teachers were parents themselves. However, observations by fieldworkers revealed that parents typically made respectable but ineffective efforts to improve their children's health, mainly favouring other priorities such as encouraging relaxation activities or seeking to improve parent-child relationships by giving their children more control.

Eating on the street as a function of Mexican culture and family bonding. The children in the study spoke about 'the street environment'. The street is the place where children eat food and meet friends. However, time spent on the streets is not necessarily positive because of the lack of security and organized sports activities, as well as the unhealthy food stalls. It is common for children to eat from street vendors accompanied by one or both parents and over time this practice has become part of the culture of public life in Mexico. The children and parents in the interviews constructed eating

on the street as a family activity and a function of family bonding. One mother admitted this in the excerpt below.

- Interviewer (I): Why do you think that adults are becoming obese?
- Marta (M): Because we do not take care of ourselves.
- I: Why do you believe that happens?
- M: Because we are lazy; we are lazy and we want to eat whatever we want. We don't want to cook and we don't want to prepare food. We would rather eat food from street vendors.

The excerpt above also demonstrates how the practice of eating street food is convenient and encouraged by their immediate environment. It is described by participants as part of the fabric of life in Mexico City and appears to be embedded in the culture. A way to possibly shift these practices in a more positive direction would be to introduce healthy food options at these street vendors.

Discourses of physical activity. Although many of the areas these families live in have public spaces for physical activities, such as outdoors gyms in parks, the families did not seem to use them. Outside of these outdoor gyms, there is no other access to organized physical activities. Children reported low levels of physical activity and high levels of sedentary activities, such as watching television or spending time on the computer. This is partly due to urban family dynamics, characterized by scarce parental supervision. A physical education teacher emphasized this trend in the excerpt below and constructs public spaces as unsafe.

They should just jump, run or join some activity or do something physical. Even the parents could join in some type of physical activity. There is not much safety in the streets, there are too many apartments and unfortunately, we have to live there.

(Physical education teacher)

One girl, Guadalupe, reiterates how public spaces in her neighbourhood are unsafe for children, like herself.

- Guadalupe (G): After school, I watch some TV and do my homework. Later, my mom lets me use my computer.
- Interviewer (I): What do you like to do with your computer?
- G: Play games. Also, when I have computer homework, I can look it up. In a few cases, the risks that the streets imply discourage physical activity as we see here:
- I: Is there a park near your house?

- G: Yes.
 I: Can you go there by yourself?
 C: No, because it is not a safe place for unsupervised children.

Guadalupe's construction of public spaces as unsafe illustrates the challenges many children face living in low socio-economic areas in the city, as well as social problems of crime and public insecurity in Mexico, which serve to construct the problem of childhood obesity.

Fieldnotes revealed that physical education classes were limited and lacked information regarding nutrition and physical activity. Physical education classes were constructed by some teachers as 'a waste of time' and typically covered the minimum criteria established by the school system. This is a symptom of the public-school system in marginalized areas in Mexico City and speaks to a wider problem regarding the standard of education in public schools in the country.

Interviews revealed that parents constructed physical activity as a healthy but unpleasant activity. They constructed their children as being responsible for how much they exercised. The excerpt below is demonstrative of the permissive parenting styles found in the study, in which children are constructed as being in control of whether their health behaviours.

- Interviewer: What do you think of a child who does not exercise? Why do you think children do not exercise?
 Carmen: Because the child does not like or want to exercise.

Discussion

This study wanted to specifically explore how obesogenic environments and the social construction of food choices and physical activity, contributes to the childhood obesity epidemic in Mexico. Results revealed how children's choices around nutrition and physical activity were constrained by their environment and discursive constructions. The results reflected existing research on obesity in Mexico City, which also highlighted parental time constraints, permissive feedings styles, unhealthy food preparation practices, the lack of knowledge regarding nutrition, the lack of safe public spaces for physical activity and the high availability of unhealthy food (Aceves-Martins et al., 2016; Rodríguez-Oliveros et al., 2011).

This study revealed that the increasingly urban lifestyle in Mexico City was creating an environment, which allowed obesity to flourish. Changes in the built environment meant that children were not getting as much physical activity as they should. Children were often driven to and from school and were unable to access safe public spaces such as urban parks because they were constructed as unsafe. As a result,

children reported low levels of physical activity and high levels of sedentary activities, such as watching television or spending time on the computer. These trends in the built environment, which result in lower levels of physical activity and more sedentary activities, have been attributed to contributing to childhood obesity (Anderson and Butcher, 2006; Boone-Heinonen and Gordon-Larsen, 2012; Saelens et al., 2012; Wolch et al., 2010). Low levels of physical activity were also found among children in lower socio-economic status groups in South Africa, highlighting the increased risk to obesity many children in low socio-economic groups in developing countries face (McVeigh et al., 2004). These findings also indicate wider social problems in Mexico such as public insecurity, crime and corruption, which make public spaces in low-income areas unsafe and perpetuate social inequalities (Arteaga Botello, 2015). Similar to Jennings-Aburto et al. (2009) research on physical education in public schools in Mexico City, this study also revealed that physical education is insufficient in public schools and it is recommended that the quantity and quality of physical education be increased.

The discourses surrounding food choices were complex and closely tied to the children's relationships with their parents. Similar to Brewis' (2003) study, food was constructed as a cultural index of parental caring and a way to express love, which reinforced permissive feeding styles in the home. These permissive feeding styles and discourses of food as parental caring may have been transmitted intergenerationally and reinforced through the culture in the family, making these practices even more difficult to change. Findings revealed that parents appeared to use food as a bargaining tool to improve their relationships with their children and a way to express affection. These findings are similar to another study with parents and adolescents in Paris, which explored discourses of food and also found that food was constructed as a way to express love in the family (Lachal et al., 2012). Similarly to this study, the Paris study found that meals were constructed as moments of family cohesion and food was seen as a function of parental caring (Lachal et al., 2012). This study, similarly to Lachal et al. (2012), also found that food appeared to be used by children and parents to navigate their relationships in the home.

The results of the study showed that children and parents were able to easily access cheap, processed food and many constructed going out daily for junk food as a family activity and a way to bond. Food for convenience sake was also positioned as important. This finding is demonstrative of how economic liberalization and globalization in the developing world have allowed food marketers to introduce a large variety of new products, distribute them widely, price them reasonably, adapt them to local cultures and promote them to their most responsive target audiences, especially children (Witkowski, 2007). Children are constantly exposed to the advertising of high-density foods and the quantity of food they consider sufficient (Chambers et al., 2013). Along with

these messages, they also receive other messages promoting comfort and sedentary activities. The food industry should accept some responsibility for the discourses around health and nutrition they are communicating to the public because these messages ultimately have serious health consequences for consumers (Witkowski, 2007). However, it is unlikely that this type of consumer exposure will decrease in the near future in Mexico. Therefore, short-term interventions should focus on the defensive responses of the children and their families (Swinburn et al., 2011).

Conclusion and recommendations

This study aims to understand childhood obesity in Mexico City by exploring the role of obesogenic environments and how they shape the social discourses around food and physical activity. The study found that children are affected by different environments they are immersed in and the pervasive discourses surrounding food and physical activity, which serve to construct their poor nutrition choices and sedentary lifestyle. It is clear from the research that parents and teachers need more support in helping their children make healthy choices. The current challenge in formulating policies that address childhood obesity lies in trying to find the most effective way to change children's environment, which will allow them to make healthier choices around nutrition and physical activity (Anderson and Butcher, 2006).

Any intervention with possibilities of success must approach the problem of childhood obesity more realistically (Birch and Ventura, 2009; Hoddinott et al., 2012). Ideally, a multiple-intervention strategy should be used and should include: mass media campaigns, physician counselling, school-based interventions, food labelling, fiscal measures and food advertising regulations (Cecchini et al., 2010). Work should be done at all levels of the obesogenic environment (Lobstein et al., 2004). At an individual level, the consumption of water instead of soda and more physical activity should be encouraged; however, at the government level, there needs to be a focus on the

food industry, stakeholders, and governmental actions across sectors to ensure coherence in policies aimed at obesity prevention; to set fair prices for fresh fruits and vegetables; to provide the proper infrastructure to supply portable water at schools and public places; and to regulate high caloric content food advertising in cinemas, theatres, public places, and TV programming for children. (Aceves-Martins et al., 2016: 11)

In addition, in order to halt the obesity epidemic, there also needs to be improved access to plant-based diets and an end to weight discrimination (Marks, 2015).

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