

TEORÍA Y MÉTODO

Síntesis de teoría de la percepción materna del peso corporal del hijo

Theory synthesis of maternal perception of her child's body weight

Síntese da teoria da percepção materna do peso corporal do filho

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Abstract: To build a middle range theory of maternal perception of her child's body weight. This middle range theory was built deductively from the concept of social perception and from research literature published following the steps of theory synthesis. This theory has inputs, and the maternal perception of her child's body weight is the outcome, that influence on maternal attitudes, and behaviors related to the child's body weight. This theory offers an explanation how mothers build a judgement about their child's body weight. The professionals could work with the factors that influence the maternal perception of her child's body weight.

Keywords: Body weight; nursing theory; weight perception; mother-child relations.

Resumen: Desarrollar una teoría de rango medio de la percepción materna del peso corporal del hijo. Esta teoría fue desarrollada de forma deductiva a partir del concepto de percepción social y de hallazgos científicos publicados, siguiendo los pasos de síntesis de teoría. Esta teoría tiene elementos de entrada y la percepción materna del peso del hijo es el resultado, que influye en las actitudes y conductas maternas relacionadas al peso corporal del hijo. Esta teoría ofrece una explicación de cómo las madres construyen el juicio respecto al peso corporal de su hijo. Los profesionales podrían trabajar con los factores que influyen en la percepción materna del peso corporal del hijo.

Palabras clave: Peso corporal; teoría de enfermería; percepción del peso; relaciones madre-hijo.

Resumo: Desenvolver uma teoria de classe média da percepção materna do peso corporal do filho. Essa teoria foi desenvolvida dedutivamente a partir do conceito de percepção social e descobertas científicas publicadas, seguindo as etapas de síntese da teoria. Essa teoria tem elementos de entrada e o resultado é a percepção materna do peso corporal do filho, que influencia as atitudes e comportamentos maternos relacionados ao peso corporal do filho. Essa teoria oferece uma explicação de como as mães constroem seu julgamento sobre o peso corporal do seu filho. Os profissionais poderiam trabalhar com os fatores que influenciam a percepção materna sobre o peso corporal do filho.

Palavras chave: Peso corporal; teoria de enfermagem; percepção do peso; relações mãe-filho.

INTRODUCTION

Childhood obesity has witnessed an increase in prevalence (Weihrauch-Blüher, & Wiegand; 2018). This increased prevalence is alarming and associated with numerous health and psychological complications, such as hyperlipidemia, hypertension, and abnormal glucose tolerance (Gurnani, Birken, & Hamilton, 2015).

Moreover, overweight and obese children are likely to stay obese into adulthood, and more probability to develop chronic diseases like diabetes and cardiovascular illness (Sahoo, Sahoo, Choudhury, Sofi, Kumar, & Bhadoria; 2015). Unlike adults, children, especially preschoolers are vulnerable population who are unable to choose where to live, or what foods to consume and have limited capacity to understand the long-term consequences of unhealthy behaviors. Therefore, special public health strategies are needed in the fight against the childhood obesity epidemic.

The literature reports that parents strongly influence habits that impact weight status. In some cultures, such as Mexican and Latino, mothers are the primary caregivers for their children and are in a unique position to influence their child's behaviors (Martinez, Kyung, Rhee, Blanco, Boutelle, 2017). However, mothers often do not realize when their children are overweight or obese (Blanchet, Kengneson, Bodnaruc, Gunter, & Giroux, 2019); this trend is most evident in parents with children aged 2–6 years compared with parents of older children (Rietmeijer - Mentink, Paulis, Middelkoop, Bindels, & Wouden, 2013; Queally et al., 2018).

The pattern of underestimating weight and impact to health has been noted as a potential reason for taking actions to manage or treat child's excess weight (Howe, Alexander, & Stevenson, 2017; Ruiter et al., 2020). Therefore, helping mothers to recognize their children's excessive weight status and its associated health consequences is the first step to facilitate and motivate parental practices towards raising healthy young children.

Maternal perception of her child's body weight (MPCW) can be defined as a maternal judgment about her child's weight that represents the congruency between a maternal belief about the child's weight status and the measured child's weight expressed as weight status (Mareno, 2014). Thus, educating mothers to identify her child's weight status and its related health consequences is the first step to facilitate and motivate parental practices toward raising healthy young children (Ruiter et al., 2020). Another related implication is that interventions to improve knowledge of perception of her child's weight need be developed and tested (Howe et al., 2017).

In this scenario, health personnel play a crucial role in the promotion of healthy habits and can help families, particularly the mothers, to recognize their children's excess weight as a health problem, in order to increase their interest and availability to participate in prevention and control interventions. Moreover, an important feature of this role is to understand how the mothers' build their perception of her child's body weight.

The body of work and literature describing the impact of MPCW emerged in the year 2000. In most of the studies, mothers have participated, and in less proportion fathers and other caregivers. In addition, a high proportion of the studies have been conducted in the United States of America (Table 1). In addition, there has been much fewer have been published in countries such as Germany (Warschburger & Kröller, 2009), Saudi Arabia (Aljunaibi, Abdulle, & Nagelkerke, 2013), Australia (Spargo & Mellis, 2014), Finland (Vuorela, Saha, & Salo, 2010), Italy (Binkin, Spinelli, Baglio, & Lamberti, 2013; Genovesi et al., 2005), Peru (Carrillo-Larco, Bernabe-Ortiz, Miranda, Xue, & Wang, 2017), Singapur (Cheng et al., 2016); Ireland (Queally, et al., 2018), and Mexico (Ávila-Ortiz, Castro-Sánchez, & Zambrano-Moreno, 2017; Flores-Peña et al., 2014b; Vallejo, Cortes-Rodríguez, & Colin-Ramirez, 2015).

The literature previously mentioned, besides those documented in systematic reviews, and meta-analysis (Blanchet et al., 2019; Doolen, Alpert, & Miller, 2009; Francescato, Santos, Coutinho, Costa, 2014; Gauthier & Gance-Cleveland, 2015; Lundahl, Kidwell, & Nelson, 2014; Parry, Netuveli, & Saxena, 2008; Rietmeijer - Mentink et al., 2013; Tompkins, Seablom, & Brock, 2015; Towns, & D'Auria, 2009), allowed researchers to identify the proportion of mothers who had an inaccurate perception of their child's body weight as between 27.9% to 100%. However, the most common mistake was the maternal underestimation of her child's body weight, particularly overweight children and obese children. This underestimation also occurs with higher frequency in parents of children between 2-6 years old, in comparison with parents of older children (Rietmeijer - Mentink et al. 2013).

If up to 100% of the mothers of children who are overweight-obese might have a non-accurate MPCW, they might have a lower disposition to get involved in interventions for management of the child's weight or to change attitudes or practices that contribute to decreasing the child's weight. Although studies are available on the phenomenon of maternal perception of her child's body weight, no attempt has been made to organize the findings into a coherent whole. Therefore, the purpose of this paper is to propose a preliminary theory of Maternal Perception of her Child's Body Weight using theory synthesis.

THEORY SYNTHESIS METHOD

Walker and Avant (2011) suggest that theory synthesis is construction of a theory, an interrelated system of ideas from evidence. In this strategy, a theorist pulls together available information about a phenomenon. Concepts and statements are organized into a network or whole, a synthesized theory. This method can be employed after organizing existing knowledge into a framework about a problem in a clinical area.

Theory synthesis involves three steps or phases. The first step is specifying focal concepts to serve as anchors for the synthesized theory. In this step the focal concept is perception. The second step in theory synthesis is reviewing the literature to identify factors related to the focal concept and to specify the nature of relationship. In theory synthesis, a theorist may combine information from various sources during theory building: qualitative or quantitative observations, available data banks, and published research findings. The third step in theory synthesis is organizing concepts and statements into an integrated and efficient representation of the phenomena of interest. The core concepts should be defined, and the relationships within and among statements can be presented in a graphic model of the phenomenon.

THEORY SYNTHESIS

In the first step of this synthesis, the focal concept is perception, specifically maternal perception of her child's body weight, the concept of perception is widely used as a component of theories. In the second step of this theory synthesis, the literature published in Spanish, Portuguese and English between 2000 – 2020 were reviewed. The inclusion criteria were articles related to the topic of interest whose participants included main caregivers of preschool children with correlational, cross-sectional or longitudinal design. Furthermore, the articles were only included if they evaluated the focal concept MPCW

On May 2020, electronic databases were searched: PubMed, EBSCO host (Medline, Health Source, Nursing / Academic edition, Medic Latina, CINAHL), Ovid, Springer link, ELSEVIER, Scielo, Scopus, Web of Science (Science Citation Index Expanded and Social Sciences Citation Index), in addition to the academic Google search engine. For the information search, the keywords in DeCs and Mesh Health Sciences Descriptors were identified: weight perception, mothers, preschool, caregivers, obesity and overweight. For a more sensitive search, the boolean operators "AND", "OR" and "NOT" were used, as well as truncators.

To select the studies, initially there were introduced the keywords, the Boolean operators and truncators in the selected databases, duplicate citations were eliminated, then those articles that included the variables in the title were selected from the databases, articles were evaluated and those that did not meet the inclusion criteria were excluded. Studies were excluded for the following reasons: focus on participants with specific medical conditions, articles focused on eating problems, or focused on infant weight problems as the main outcome.

The main findings are displayed in Table 1, where some factors were identified that influence MPCW, such as sex and child age, mother's body mass index, ethnicity, socioeconomic level, and some contextual factors.

A concept analysis of parental perception of child weight was performed by Mareno (2014) defined it as a parent's judgement of their child's body weight formulated by a parent's recognition of body size, physical appearance, functional abilities, psychosocial effects, and health effects related to current body weight. The author adds that the idea of incongruity between an individual's perception and objective reality has been the cornerstone of contemporary research on parental perception of child weight. Mareno (2014) also mentioned the lack of an existing theory to frame the concept and proposed a middle range explanatory theory.

However, it is important to note that Mareno (2014) also considered a healthy weight of the child as an outcome of parental perception of child weight, however, it is hypothesized, the underestimation can conduct to unhealthy feeding practices, like pressure to eat (Harrison, Brodribb, Davies, & Hepworth, 2018;) and unhealthy maternal feeding styles (Yilmaz, Erkorkmaz, Ozcetin, & Karaaslan, 2013), in addition mother's that not recognize her child is overweight or obese, argues that they do not take actions to management her child body weight because her children don't needs it (Flores-Peña et al., 2014), in contrast Hidalgo-Mendez, Power, Fisher, O'Connor, & Hughes (2019) found that maternal perceptions of child's body weight were not related to maternal feeding styles, instead, children's weight status was the strongest predictor of maternal feeding practices and feeding styles.

On the other hand, according to social psychologists, when a person perceives another person, this is a process of social perception (Salazar, Montero, Muñoz, Sánchez, Santero, & Villegas, 2003). This process can be considered as a system with an input composed by three elements: 1) Stimulus person's characteristics; in our theory about MPCW, the stimulus person is the child (he or she) and their characteristics such as: a) age, b) sex, and c) child's body mass index (BMI); 2) Stored information about the stimulus person; in our theory this is the information that the mother has about the child's body weight, including, if someone on the health team told the mother that her child is gaining weight too fast or is overweight, and maternal perception of the child's physical activity habits and abilities, including maternal perception of days per week the child is involved in active physical exercise and the child's physical exercise amount and running speed as compared with other children (Eckstein, Mikhail, Ariza, Thomson, Millard, & Binns, 2006).

Table 1. Factors associated with the maternal perception of child’s body weight

Year	Authors	Country	Results
2005	Genovesi et al.	Italy	Child (age), Mother (education). Multivariable analysis revealed that mother’s education level ($p = 0.01$) and child’s age ($p = 0.04$) cumulatively affect MPCW. Mothers with university education have an accurate perception of their child’s weight at a higher proportion.
2005	Jeffery et al.	United Kingdom	Child (gender). Mothers were less likely to recognize OW sons than OW daughters (27% vs. 54%; $p = 0.01$).
2006	Eckstein et al.	United States	Child (age) and contextual factors. Children aged >6 years had a higher probability that their parents perceived them to be OW than those aged <6 years (OR, 7.0; 95% CI: 2.3–21.4). Moreover, the probability increased when parents perceived their children slower or less active than other children (OR, 9.8; 95% CI: 1.8–52.8) and when the doctor had told parents that the child was OW (OR, 8.5; 95% CI: 0.95–76.6).
2009	Doolen et al.	United States	Child (gender), Mother (education, and race). Mothers underestimated their daughters’ weight in higher proportion than their sons’ weight. Mothers with a higher education level and white race had a higher probability of having accurate perception of their children’s OW status.
2009	Warschburger & Kröller	Germany	Children (BMI), Mother (BMI). The underestimation correlated with the mother’s high weight ($\beta = 1.06$; $gf = 1$; $p = 0.02$; OR, 2.90; 95% CI: 1.19–7.07) and the child’s weight ($\beta = 1.42$; $p = 0.03$; OR, 4.13; 95% CI: 1.15–14.86).
2010	Vuorela et al.	Finland	Child (gender and age). The discrepancy among the perception and the real child’s weight was more common in 5-year-old OW/OB girls who were classified as healthy weight [κ , 0.08; 95% CI: –0.05 to 0.20] concordance (78.5%; $p = 0.061$).
2014b	Flores-Peña et al.	Mexico	Child (age, BMI). Context factors. The probability for accurate MPCW increases as the child’s age and BMI increases, if the economic income is higher, if a physician has informed the mother about the gain of weight or the child is OW, if the mother realizes her child usually runs slower compared with other children of the same age, or when the mother feels worried about the child’s weight.
2019	Blanchet et al.	Systematic Review	Children’s weight status, gender, and age. Parents’ weight status, parental education levels and socioeconomic status, and ethnicity.

BMI, body mass index; CI, confidence interval; MPCW, maternal perception of child’s body weight; OR, Odd’s ratio; OW/OB, overweight or obese.

And 3. Context information a) maternal concern about the child's body weight; b) maternal knowledge of the overweight – obesity effects on health. This information might be obtained by asking questions such as: overweight or obese children are likely to be overweight as adults, overweight or obese children are more likely to develop diabetes (high blood sugar) than children who are not overweight, overweight or obese children are more likely to have problems in their social relationships with other children than children who are not overweight (Eckstein et al. 2006); c) Maternal beliefs about her influence as a modeler for the child's eating habits and physical activity; and d) the family heritage of chronic diseases associated with overweight or obesity, such as heart attack, stroke, diabetes type 2, and high blood pressure in the child's parent, grandparent, or siblings (Eckstein et al. 2006).

The information from these three elements is filtered by one dynamic element in the system; the input selector, who is the perceiver. In our theory, the input selector is the mother, as a dynamic element who decides which information is selected. This information is affected by the perceiver's characteristics, which in this theory are: a) age, body mass index, education, economic income, ethnicity, and work (Hong, Peltzer, & Jalayondeja, 2019; Ruiters et al. 2020) The process ends in a MPCW which can be defined as maternal judgement about her child's weight that represents the congruency between a maternal belief about the child's weight status and the measured child's weight expressed as weight status. The MPCW would be accurate or not, and when the judgment is not accurate would be identified as underestimation or overestimation.

Core Definitions of Middle Range Theory "Maternal Perception of her Child's Body Weight" This Middle Range Theory has a core elements: 1) stimulus person's is the child and their characteristics such as: a) age, b) sex, and c) child's body mass index (BMI); and 2) the perceiver, the mother with characteristics, such as: age, body mass index, education, economic income, ethnicity, and work / mothers are employed underestimate her child body weight when her child is normal weight (Hong, Peltzer, & Jalayondeja, 2019). In the other hand, the core concepts identified were a) maternal perception of her child's body weight, b) stored information about the stimulus person, and c) attitudes, feeding practices and behaviors.

These concepts are defined below.

Maternal perception of her child's body weight is the judgement in respect to congruence between the mother's belief about her child's body weight, expressed as very low weight, low weight, right or normal weight, overweight or obese (categorical) and the child's measured body mass index in percentile classified in accordance with Child Growth Standards of the World Health Organization or standards of each country. If the maternal judgement is

congruent with measured body mass index the MPCW is considered accurate or concordant; otherwise it is considered inaccurate and could be underestimation or overestimation. In addition, other methods can be used to assess the MPCW, such as sketches (Eckstein et al., 2006), and silhouettes (Warschburger & Kröller, 2009; García et al., 2020), or pictures (Reifsnider et al., 2006).

Stored information about the stimulus person includes the information that the mother has about her child: if the mother knows her child is gaining weight too fast or is overweight because someone of the health team informed her, and maternal perception of the child's physical activity habits and abilities (maternal perception of days per week the child is involved in active physical exercise and the child's physical exercise amount and running speed as compared with other children) (Eckstein et al. 2006).

Attitudes, Feeding Practices and Behaviors are factors that have been documented related to child's body mass index. In this theory are feeding styles, feeding practices, actions and problems to management child's body weight. Attitude toward the behavior is defined as a mother overall favorableness or unfavorableness toward performing the behavior, is the mother's emotional response to the idea of performing a recommended behavior. Mothers with strong negative emotional response to the behavior are unlikely to perform it, whereas those with a strong positive emotional reaction are more likely to engage in it (Montaño & Kasprzyk, 2008).

Maternal feeding styles refers to the emotional climate of mother-child relationship during the feeding. Levels of demandingness compared with responsiveness are used to categorize mothers into 1 of 4 styles: a) authoritative feeding style - high demandingness/high responsiveness, b) authoritarian feeding style - high demandingness/low responsiveness, c) indulgent feeding style - low demandingness/high responsiveness, and d) uninvolved feeding style - low demandingness/low responsiveness. The Caregiver Feeding Styles Questionnaire (CFSQ) can be used to evaluate maternal feeding styles (Hughes, Power, Orlet Fisher, Mueller, & Nicklas, 2005).

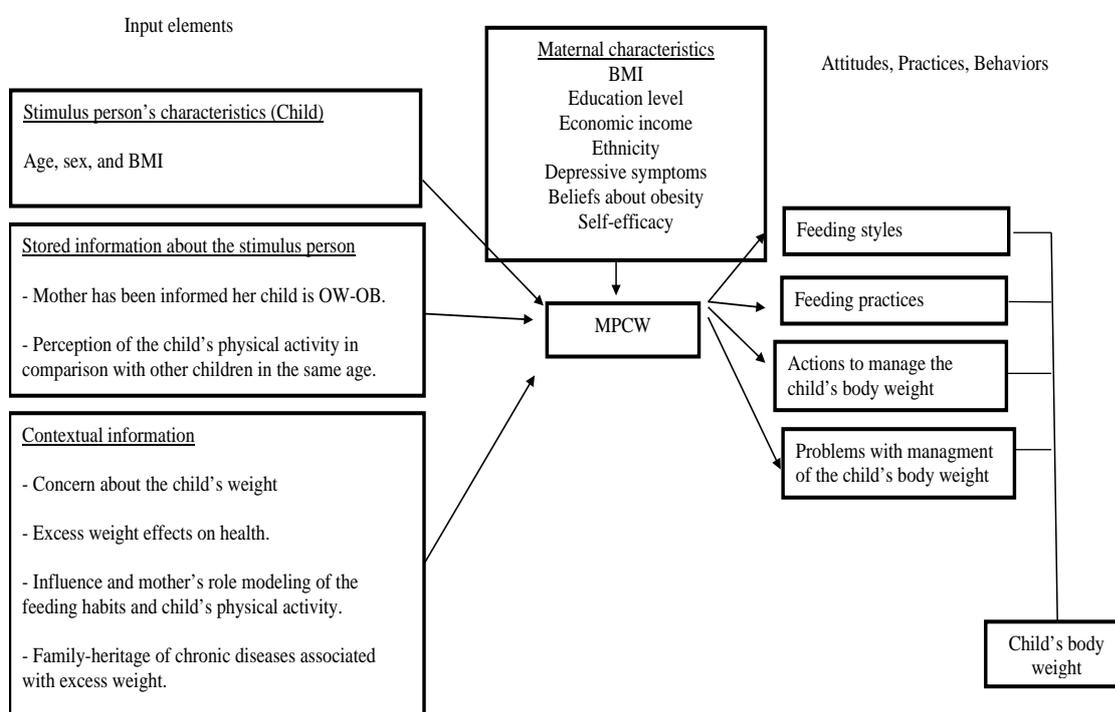
Maternal child feeding practices refer to the behaviors or actions) intentional or unintentional) performed by mothers for child rearing purposes that influence their child's attitudes, and behaviors. Vaughn et al. (2016) identified 3 high order constructs, 1) coercive control, 2) structure, and 3) autonomy support, and specific food practices, such as: restriction, pressure to eat, monitoring, and negotiation. This concept can be evaluated by the Child Feeding Questionnaire (CFQ) (Birch, Fisher, Grimm-Thomas, Markey, Sawyer, & Johnson, 2001), and by Comprehensive Feeding Practices Questionnaire (Musher-Eizenman & Holub, 2007).

Actions to manage the child's body weight are the activities the mother uses to keep or to reach the normal weight in the child, expressed as: 1) doing nothing because I consider my

child does not have overweight, 2) buying less food high in fat and sugars, and replacing soda, Kool aid or other high sugar drinks with natural fruit water, and decreasing fast food, and 3) increase physical activity.

Problems of managing the child's body weight are the problems perceived by the mother in managing the child's body weight, expressed as: 1) I have no problems with this, 2) Other family members give my child food without my knowledge, 3) My child cries if I do not give him/her what he/she wants. This variable can be evaluated through the Lifestyle Behavior Checklist (LBC), which mentions 25 items related to the weight, the alimentation and the physical activity and evaluates how much each of the 25 LBCs represents a problem for the mothers in its management, with a score from 1 to 7 where 1 is not at all, 2 and 3 a little, 4 somewhat, 5 and 6 much and 7 very much. Also, this scale could evaluate the maternal self-efficacy to manage behaviors related to the child's weight (West & Sanders 2009). The results of this theory synthesis are presented in Figure 1.

Figure 1. Results of: synthesis of maternal perception of her child's body weight



Source: Middle range theory Maternal Perception of Child's Body Weight

DISCUSSION

Childhood obesity is one of the most serious public health challenges of the 21st century. The problem is global and is steadily affecting many low- and middle-income countries, particularly in urban settings. The prevalence has increased at an alarming rate. Globally, in 2015 the number of overweight children under the age of five, is estimated to be over 42 million, and prevalence of childhood OB in Mexico is one of the highest worldwide.

Since young children do not have the knowledge and abilities to take care of themselves, the parents are the principal agents to give care to their children, and the principal caregiver is often the mother, who spends more time with the children, even if she works out of home. Therefore, it is very important that the mother knows different options in order to, help her child to be healthy. The first step in this process is to help and educate the mother so that she recognizes if her child is overweight or obese, as well as helping her understand the health consequences of overweight and obesity. This might increase the maternal disposition to engage in and practice healthy habits for herself and her family.

This paper creates some thoughts on theoretical elements of impact on maternal perception of her child' body weight, in an attempt to contribute to the body of knowledge, and to provide an explanation about this phenomena. It is very important to note that, the majority of studies used only mothers as participants. However, describing the perceptions and participation of the father and other caregivers in the eating behaviors of the family may be crucial to truly making lifestyle changes related to childhood obesity and overweight.

CONCLUSIONS

The strategy of theory synthesis exemplifies the process of transforming practice-related research about phenomena of interest into an integrated whole (Walker & Avant, 2011). In this case, the theory synthesis integrated the knowledge and empirical findings compiled from the last 15 years. The proposed model could be expanded through the incorporation of new concepts and relationships, and be verified in other research studies and populations, supporting or rejecting the relationships proposed here.

One opportunity to consider for further research is the participation of the father, and grandparents or other caregivers who may be involved in child feeding.

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