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assessoria@jped.com.br

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studies in this context are needed to provide more insight into the disease process.

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# The challenge of feeding children to protect against overweight

Shiriki K. Kumanyika,<sup>1</sup> Kristie J. Lancaster<sup>2</sup>

Pediatricians and other health professionals who work with parents of young children have the daunting responsibility of interpreting and communicating guidance about how best to feed children during their development years. Traditionally, the goals in providing such guidance have focused on assuring adequate energy and protein intake, preventing deficiencies of vitamins and minerals and preventing dental disease. However, concepts of optimal child nutrition have been expanded and the challenges of providing appropriate nutritional guidance have increased. This relates both to changes in patterns of nutrition-related disease and to recognition of the role of nutritional factors in the development of diseases throughout the life course. Goals for feeding children now also

address considerations related to prevention of chronic diseases, including cardiovascular diseases, cancers, and mental disorders – conditions for which the origins may begin very early in life even when diagnosis does not occur until adulthood.<sup>1</sup> Important concerns include not only what children eat when young but also how the eating habits they develop during childhood may affect what they eat later in life.

Within the realm of chronic diseases, concerns about obesity are particularly compelling. Epidemic levels have already been reported in many countries and are on the horizon for many others.<sup>2</sup> Food supplies are changing globally, and the availability of foods that are high in calories from fat and sugar but otherwise nutritionally-poor has increased markedly, even

1. PhD. Professor, Department of Biostatistics and Epidemiology and Pediatrics, School of Medicine, University of Pennsylvania, Philadelphia, PA, USA.

2. PhD. Associate professor, Department of Nutrition, Food Studies & Public Health, New York University, New York, NY, USA.

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for people with limited incomes.<sup>3</sup> Moreover, excess energy intake and obesity are occurring in countries where undernutrition and growth stunting are still in evidence.<sup>1,4</sup> In some cases, the risks of becoming obese are of particular relevance for children who have been undernourished and are stunted.<sup>1,5</sup>

Children with relatively high levels of body fat may seem to be very healthy in comparison to children who are thin and hungry. However, the adverse health consequences of obesity are well documented. They begin in childhood, may last throughout life and may shorten life.<sup>6</sup> Indeed, adult onset diseases such as diabetes and hypertension are being seen increasingly in children. Understanding how to appropriately feed children in order to prevent or curb the development of obesity is, therefore, of extremely high clinical and public health importance. This understanding must be expressed in terms of potential food choices, feeding regimens, and food program policies.

In their article in this issue, Kranz et al.<sup>7</sup> focus our attention on feeding children in the 2 to 5 year age range – examining how well the children's dietary intakes fit with current guidelines for optimal nutrition, using the concept of "dietary quality," and how levels of being overweight or at risk for overweight differ according to their definition of dietary quality. These authors use the American terminology in which children in the highest category ( $\geq$  95th percentile) of the body mass index (BMI) growth charts are termed "overweight," rather than obese, and "at risk for overweight" is between the 85th and 95th percentiles. They analyze data that are representative of 2 to 5 year old children in the American population using national survey data collected in 1999 through 2002. The data set used has the advantage of including highly standardized height and weight measurements on which to base determinants of weight status. In addition, the parental reports of the children's dietary intake were collected with rigorous interview protocols and subjected to detailed analyses of nutritional content.

As already noted, the multiple considerations for defining dietary quality involve both adequacy and excess. The analyses presented by Kranz et al. draw upon their prior work to develop and then update a comprehensive index tailored by age and gender for children in the 2 to 5 year age range, the Revised Diet Quality Index for Children (RC-DQI), and incorporating the spectrum of relevant dietary constituents.<sup>8</sup> The 13 components of the index include six key food groups, iron and protective fatty acids, two components associated with consumption of excess calories, and another item that attempts to characterize energy balance. Summing ratings over all components yields a score with a maximum value signifying that the day's food intake meets, on average, all guidelines for what 2 to 5 year old children should eat.

The most important finding is that dietary quality – as defined by Kranz et al. – can be related to children's weight status. From the figure in their article, the gradient of lower prevalence of overweight at higher levels of dietary quality appears to be clearest for the children who are in the at-risk range but have not yet crossed over the threshold to overweight. The association of dietary quality with being in the overweight category is unclear. It is possible that dietary quality has a greater role in weight status within the at-risk range rather than after children are already overweight.

Also important is the finding that relatively few 2 to 5-year-old Americans are meeting all current guidelines. There were only three of the 13 criteria in the RC-DQI for which at least 2/3 of the children had the maximum possible scores. Thus, even in a country with an oversupply of food, the consumption of an adequate and

appropriate mix of foods and protective nutrients is far from assured. In fact, dietary quality may be compromised *especially* in a country with an oversupply of food given that: 1) food products that are not in line with dietary guidelines are among those most heavily marketed to children and parents, and 2) there is a dearth of effective, competitive promotion of the types of foods emphasized in dietary guidelines.<sup>9</sup>

The finding that Mexican-American children had the best dietary quality scores overall is particularly noteworthy because Mexican Americans are socially and economically disadvantaged relative to American non-Hispanic whites. This is apparently not a general finding for ethnic minority populations. The advantageous dietary quality among Mexican-American children is quite distinct from the findings in non-Hispanic blacks. It is also independent of family income level except that it appears to be most prominent in the low-income population stratum.

Relatively better dietary quality in Mexican Americans (adults and children) was reported based on earlier analysis of the National Health and Nutrition Examination Survey (NHANES) data using the Healthy Eating Index (HEI), a dietary quality score that was based on the prior American Food Guide Pyramid.<sup>10</sup> Scores among Mexican Americans were better compared to non-Hispanic whites and blacks for fruits, total fat and sodium and better compared to non-Hispanic whites for saturated fat. Overall scores were best for people born in Mexico. The apparent persistence of certain protective dietary practices among Mexican Americans suggests maintenance of traditional preferences and less adoption of some typical American dietary patterns. As noted by Kranz et al. in their interpretation of this finding, benefits of the more plant-based Mexican American dietary pattern may be applicable to a wide range of populations in Latin America and elsewhere.

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**Table 1** - Prevalence of at risk of overweight and overweight\* in 2 to 5 year old children in three race/ethnic groups (USA, 2003-2004)

	At risk of overweight (%)	Overweight (%)
Males		
Non-Hispanic white	13.6	13.0
Non-Hispanic black	11.3	9.7
Mexican American	15.1	23.2
Females		
Non-Hispanic white	13.5	10.0
Non-Hispanic black	10.7	16.3
Mexican American	11.6	15.1

\* At risk of overweight is defined as body mass index (BMI) at or above the 85th percentile and below the 95th percentile of the Centers for Disease Control sex-specific BMI-for-age growth charts. Overweight is at or above the 95th percentile (Ogden et al.<sup>11</sup>).

Notwithstanding this positive finding about dietary quality in Mexican Americans, the prevalence of overweight and at risk for overweight in the NHANES data is as high or higher in Mexican American 2 to 5 year olds compared to their non-Hispanic white and non-Hispanic black peers (Table 1).<sup>11</sup> The data in the Table are based on the most recent data available for children in the USA, but reflect the pattern observed in data for the period analyzed by Kranz et al. These data suggest that energy balance is not better among Mexican American children, on average, and may in fact be less favorable from an obesity prevention perspective. Direct exploration of the links between dietary quality and weight status in Mexican American children is needed to resolve this apparent discrepancy.

A full understanding of the link between dietary quality and the development of overweight will require longitudinal assessments to determine whether children with better dietary quality are protected from excess weight gain. However, from a practical perspective, these cross sectional data suggest that children who are at risk for overweight are less likely than children in the healthy weight range to meet dietary guidelines. This implies a need for interventions to improve the dietary quality of overweight children in particular.

The application of insights from these data outside of the USA will be influenced by the comparability of the relevant dietary guidance issues for the population in question. The underlying concepts of optimal nutrition, while universal in some respects, are modified by specific societal and cultural contexts, including the types and quantities of foods available, typical food preferences, and other circumstances that relate to how children are fed.<sup>12</sup> In addition, although the

prevalence of underweight in children is not currently of public health concern in the USA, it is still a concern in many countries. This reminds us of how challenging it is to provide guidance that will foster optimal feeding of children under all risk circumstances.

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## Correspondence:

Shiriki K. Kumanyika  
 Department of Biostatistics and Epidemiology  
 University of Pennsylvania School of Medicine  
 8th floor, Blockley Hall  
 423 Guardian Drive  
 19104-6021 - Philadelphia, PA - USA  
 Tel.: +1 (215) 898-2629  
 Fax: +1 (215) 573-5311  
 E-mail: skumanyi@mail.med.upenn.edu

## "Doctor, I think my baby is in pain": the assessment of infants' pain by health professionals

Marie-Claude Grégoire,<sup>1</sup> G. Allen Finley<sup>2</sup>

It was not that long ago that some health professionals did not believe infants could feel pain. Infants were not always given analgesics in the postsurgical period and sometimes during the surgery itself. Pain was not recognized as an important treatable symptom, and therefore was rarely assessed. It was only during the 1980's that clinicians and researchers started to measure the impact of pain assessment and treatment in infants.<sup>1</sup> Despite these research advances, it took years before pain assessment and treatment in infants became generalized, and unfortunately, they are not yet universal today in the medical world.

Parents, on the other hand, have known for ages that their young children can suffer pain. The article by Elias et al.,<sup>2</sup> in this issue of the *Jornal de Pediatria*, illustrates well this disagreement between parents and health professionals. The most interesting finding of this study, performed in a non-acute pain situation, is that the agreement between parents and health professional was better in extreme situations, where pain was obviously present or absent, and decisions

about treatments were not in doubt. It is in that gray zone of moderate pain that the disagreement was the most important, the zone where a few points higher or lower on the visual

analogue scale (VAS) will make a difference between using an analgesic medication or not. Of this disagreement, only 10% could be explained by factors inherent to babies, leaving a large proportion of the difference of opinion to factors related to the person assessing the pain and to the context surrounding the assessment. This is not surprising,

in a situation where the pain is not what the infant says, but what the parent or health professional says.

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Disagreement between parents and health care professionals has been shown in the past for infants and toddlers,<sup>3</sup> but also between health professionals<sup>4</sup> and between children and parents.<sup>5</sup> Using a VAS as a global pain assessment score by proxy may increase the risk of disagreement. The VAS is an observational scale in which each observer uses a collection of behavioral cues, which they interpret in the context of their own experience. In particular, the meaning of the anchor

1. MD, MSc, FRCPC. Dalhousie University, Halifax, Nova Scotia, Canada.

2. MD, FRCPC, FAAP. Dalhousie University, Halifax, Nova Scotia, Canada.

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