

Les parents sont-ils conscients que leurs enfants souffrent de surpoids ou d'obésité?

S'en préoccupent-ils?

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RÉSUMÉ

OBJECTIF Comparer la condition pondérale réelle des enfants aux perceptions qu'en ont leurs parents.

TYPE D'ÉTUDE Étude transversale, incluant un questionnaire auto-administré.

CONTEXTE Sept écoles élémentaires de Middlesex-London, Ontario.

PARTICIPANTS Un échantillon approprié d'élèves de 4^e, 5^e et 6^e années et de leurs parents. Sur les 770 paires enfant-parent approchées, 355 ont participé à l'étude.

PRINCIPAUX PARAMÈTRES MESURÉS Poids, taille et indice de masse corporelle (IMC) des enfants. Perception des parents de la condition pondérale de leurs enfants, caractéristiques démographiques de la famille et poids et taille des parents, selon leur déclaration. On a utilisé les tables pour IMC vs âge de l'United States Centers for Disease Control pour déterminer la condition pondérale des enfants (poids insuffisant, surpoids ou obésité).

RÉSULTATS Le taux de réponse a été de 46%. La condition pondérale réelle des enfants (29,9% de surpoids ou d'obésité et 1,4% de poids insuffisant) différait de la perception qu'en avait les parents (18,3% de surpoids ou d'obésité et 17,2% de poids légèrement insuffisant ou insuffisant). La capacité des parents à reconnaître la condition pondérale de leurs enfants était influencée par des facteurs comme le sexe et l'origine ethnique des enfants et par le poids de la mère. Il n'y avait pas de rapport entre le niveau d'éducation des parents, leur revenu familial et l'âge de leurs enfants et la fausse idée qu'ils avaient de la condition pondérale de leurs enfants.

CONCLUSION Une forte proportion des parents ne reconnaissaient pas que leurs enfants souffraient de surpoids ou d'obésité. L'adoption de stratégies de santé publique efficaces pour amener les parents à mieux estimer la condition pondérale de leurs enfants serait une première étape clé dans la lutte contre l'obésité infantile.

POINTS DE REPÈRE DU RÉDACTEUR

- Un premier pas dans la promotion d'un mode de vie sain et d'un poids de santé chez les enfants d'âge scolaire pourrait être d'apprendre aux parents à bien évaluer la condition pondérale de leurs enfants et à prendre conscience que le surpoids et l'obésité constituent des problèmes de santé.
- Des études dans d'autres pays ont montré que les parents se préoccupent peu que leurs enfants souffrent de surpoids ou d'obésité ou l'ignorent.
- Cette étude confirme qu'un échantillon de parents canadiens ne reconnaissaient pas que leurs enfants souffraient de surpoids ou d'obésité: 22% d'entre eux croyaient à tort que leurs enfants de poids normal étaient trop maigres; 63% jugeaient que leurs enfants avec surpoids avaient un poids normal; et 63% que leurs enfants obèses avaient un simple surpoids.

Cet article a fait l'objet d'une révision par des pairs.
Can Fam Physician 2007;53:1493-1499

Are parents aware that their children are overweight or obese?

Do they care?

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ABSTRACT

OBJECTIVE To compare children's actual weight status with their parents' perceptions of their weight status.

DESIGN Cross-sectional study, including a self-administered questionnaire.

SETTING Seven elementary schools in Middlesex-London, Ont.

PARTICIPANTS A convenience sample of pupils in grades 4 to 6 and their parents. Of the 770 child-parent pairs targeted, 355 pairs participated in the study.

MAIN OUTCOME MEASURES Children's weight, height, and body mass index (BMI). Parents' perceptions of their children's weight status, family demographics, and parents' self-reported body weight and height. The United States Centers for Disease Control's BMI-for-age references were used to define children's weight status (underweight, overweight, or obese).

RESULTS Response rate was 46%. Children's actual weight status (ie, 29.9% overweight or obese and 1.4% underweight) was different from their parents' perceptions of their weight status (ie, 18.3% overweight or obese and 17.2% slightly underweight or underweight). Factors such as children's sex and ethnicity and mothers' weight influenced parents' ability to recognize their children's weight status. Parents' misperceptions of their children's weight status seemed to be unrelated to their levels of education, their family income, or their children's ages.

CONCLUSION A large proportion of parents did not recognize that their children were overweight or obese. Effective public health strategies to increase parents' awareness of their children's weight status could be the first key steps in an effort to prevent childhood obesity.

EDITOR'S KEY POINTS

- Helping parents to recognize their children's weight status and to be aware that overweight and obesity are health problems could be the first step in promoting a healthy lifestyle and a healthy body weight among school-aged children.
- Studies from other countries have shown that parents are unconcerned and even unaware that their children are overweight or obese.
- This study confirms that a sample of Canadian parents did not recognize their children were overweight or obese: 22% of parents wrongly classified their normal-weight children as being underweight; 63% considered their overweight children as normal weight; and 63% perceived that their obese children were overweight.

This article has been peer reviewed.
Can Fam Physician 2007;53:1493-1499

Pediatric obesity has been identified as a growing problem in Canada and many countries worldwide.¹⁻⁵ The importance of this emerging trend is the connection between pediatric obesity, type 2 diabetes, hyperlipidemia, hypertension, and adult obesity.⁶⁻⁹ Given the risk of development of severe health consequences and the heavy burden on the health care system, effective prevention targeting children and their parents is the key to combating this health problem.¹⁰

Making parents aware that obesity is a health problem might be the first step in promoting a healthy lifestyle and a healthy body weight among school-aged children. Although there is no direct evidence that increasing parents' awareness of children's weight problems would prevent overweight and obesity in children, there is evidence that parents' awareness and monitoring can prevent risky behaviour among children and adolescents.¹¹

Parents who do not recognize weight problems in their children are less likely to take steps to change their children's unhealthy lifestyles and to prevent obesity. Studies from other countries have shown that parents are neither concerned about nor sensitive to their children's overweight or obese status.¹²⁻¹⁶ Little on childhood obesity has been reported in a Canadian context. As part of a multi-pronged study, this paper reports on parents' awareness of their children's overweight and obese status.

METHODS

This cross-sectional study targeted a convenience sample of children from 7 elementary schools located in diverse socioeconomic areas in the city of London and the County of Middlesex in Ontario. A desirable sample size of 384 subjects was calculated using a statistical formula for descriptive studies with dichotomous variables with a margin of error of 5% (95% confidence level).¹⁷

Participants were recruited through public health nurses in the schools who approached school principals and asked them whether they would volunteer to participate. Seven of 13 schools consented. All children in grades 4 to 6 and their parents were invited to participate in the study. Data were collected between 2001 and 2003.

The study was approved by the Brescia University College Research Ethics Board for Studies Involving Human Subjects. Written consent was obtained from parents before data collection.

Children's weight and height were measured by trained personnel using standardized procedures.¹⁸ The age- and sex-specific body mass index references from the United States Centers for Disease Control were used to classify children's weight status.¹⁹

Body mass index criteria²⁰

Underweight	<5th percentile
Normal weight	5th-85th percentile
Overweight	85th-95th percentile
Obese	>95th percentile

A self-administered questionnaire for parents was sent home with the children and returned by them to classroom teachers. Two questions that specifically asked parents about their perceptions of their children's weight status were adopted and modified from Baughcum et al.²¹ The first question was "Compared with other children the same age, do you feel your child is underweight, slightly underweight, about the right weight, overweight, or obese?" The second question, "How much are you concerned about your child becoming overweight?" had 5 answer options: unconcerned, a little concerned, concerned, fairly concerned, and very concerned. The questionnaire also asked about socioeconomic status (parents' education levels, employment, family structure, and family income) and parents' self-reported body weight and height. The questionnaire was pilot-tested on 15 parents of school-aged children for readability and clarity. Due to funding constraints, its reliability and validity were not tested.

Data were analyzed using SPSS 13.0 for Windows. Measured rates and parents' perceived rates of overweight and obesity were recorded. Because only a relatively small number of parents perceived their children as being slightly underweight or underweight, we combined these 2 categories into "underweight." The rate at which parents wrongly classified their children's weight status was calculated and presented with percentages and 95% confidence intervals by measured weight category. Logistic regression analysis was done to determine the influence of socioeconomic status, parents' own overweight or obese status, and children's sex on parents' ability to accurately identify their children's weight status.¹⁷

RESULTS

Study sample

Of the 770 pairs of children and parents targeted, 487 children and 406 parents participated. We had

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complete data on 355 pairs. Mothers filled out 87% of the questionnaires. **Table 1** shows study subjects' characteristics.

Parents' perceptions and children's actual weight categories

Figure 1 shows that children's actual weight categories were statistically different from parents' perceptions of them. Parents were more likely to perceive their children as being underweight than as being obese. **Figure 2** shows that 22% of parents wrongly classified their normal-weight children as underweight, 63% considered their overweight children as normal weight, and 63% perceived their obese children as overweight. Parents tended to underestimate their children's weight. About 26% of parents of overweight children and 15% of parents of obese children were not concerned about their children's weight.

Table 1. Characteristics of study subjects (N = 355*)

DEMOGRAPHIC PROFILE	N	%
Children's age (y)		
• 9	124	34.9
• 10	115	32.4
• 11	102	28.7
• 12	14	3.9
Children's sex		
• Boys	198	55.8
• Girls	157	44.2
Family structure		
• Two-parent families	302	85.1
• Single-parent families	53	14.9
Parents' education levels		
• Mothers' education at university or above	244	68.7
• Fathers' education at university or above	217	61.1
Annual family income		
• <\$23 000	16	4.5
• \$23 001-\$38 999	39	11.0
• >\$39 000	281	79.2
• Missing value	19	5.4
Race or ethnicity		
• White	301	84.8
• Non-white	54	15.2
Parents' weight status		
• Overweight mothers (BMI ≥ 25)	93	31
• Overweight fathers (BMI ≥ 25)	205	69.7
Parents' concerns about children's weights		
• A little concerned	89	25.3
• Concerned to very concerned	81	22.8

*N does not always equal 355 owing to missing data.

Factors associated with parents' misperceptions of children's weight status

In total, 62% of parents accurately classified their children's weight. Logistic regression analysis showed that children's sex, race and ethnicity, and mothers' overweight status were associated with parents' inability to categorize their children's weight status accurately (**Table 2**). Parents were more likely to have incorrect perceptions of their boys' weight than their girls' weight. More white parents than non-white parents were able to identify their children's weight categories accurately. Overweight mothers tended to be less aware of their children's overweight status than normal-weight mothers were. Parents' misperceptions of their children's weight status were not associated with parents' education levels, family income, or children's age.

DISCUSSION

This study confirms that a sample of Canadian parents did not recognize their children's overweight or obese status. Parents were overly concerned about children being underweight, but not about them being overweight. Overall, 38% of parents were not able to identify their children's weight categories accurately.

Studies have shown that pediatric obesity is prevalent in North America and many other countries.²²⁻²⁴ This study confirmed that many parents did not even recognize that their children were overweight and, as shown in other studies, tended to be unconcerned about the

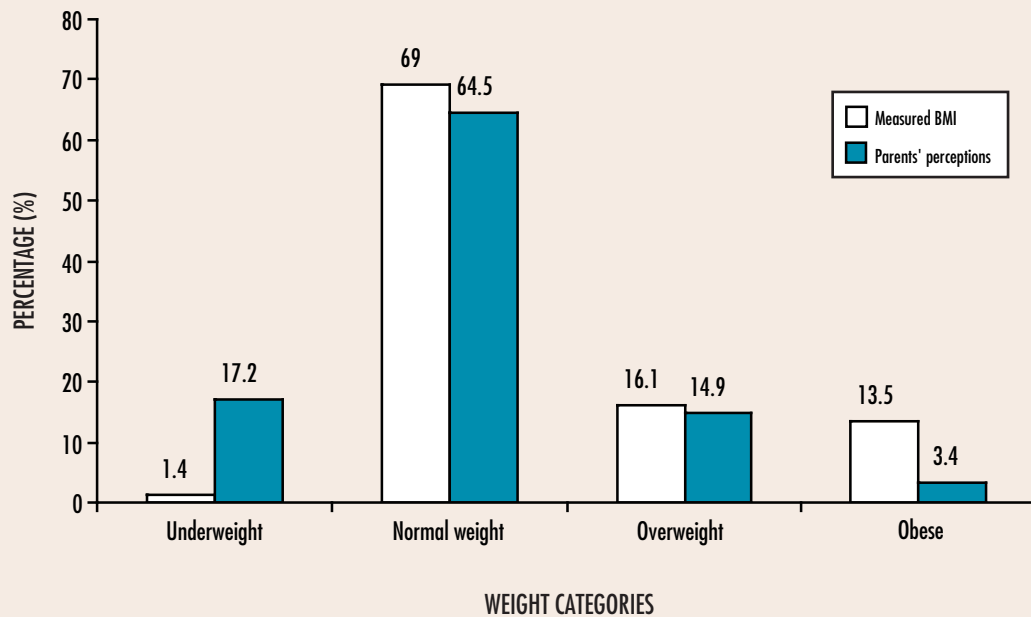
Table 2. Predictors of parents' accuracy in identifying children's weight classification*

FACTORS	N	ODDS RATIO	95% CONFIDENCE INTERVAL	P
Children's sex				<.05
• Girls	157	1.73	1.02-2.85	
• Boys	198	1.00	reference	
Children's race or ethnicity				<.05
• White	301	2.09	1.02-2.69	
• Non-white	54	1.00	reference	
Mothers' weight status				<.05
• Normal weight (BMI < 25)	200	1.60	0.95-2.69 [†]	
• Overweight or obese (BMI ≥ 25)	89	1.00		

BMI—body mass index.

*Logistic regression model using backward stepwise method (Wald test). Dependent variable: accuracy of parents' ability to classify children's weight categories. Independent variables: children's sex, age, and race; mother's and father's education levels; family income, mother's weight status, and respondent's relationship to the child (ie, mother, father, or other).

[†]Confidence intervals are based on the Wald test.

Figure 1. Children's weight categories by measured BMI and parents' perceptions

issue.^{13,14,21,25-27} Parents did not perceive their children as being overweight, as long as “they are active and have a healthy diet and good appetite.”²⁵ Qualitative research has indicated that parents, especially those from low-income families, describe overweight children as “solid” or “thick” rather than fat.²⁵

Although the reasons why parents misperceive their children's weight status are not fully understood, we found that 3 factors were associated with their misperceptions. First, in line with the literature,^{13,21,26} parents were less likely to think their boys were overweight than to think their girls were overweight. This could be because parents pay more attention to girls' body image than to boys' body image. Societal norms about the ideal weight for boys and girls might also have a role. One study showed that boys themselves tended to select substantially larger body-size silhouettes than girls did when choosing an ideal adult body size.²⁸

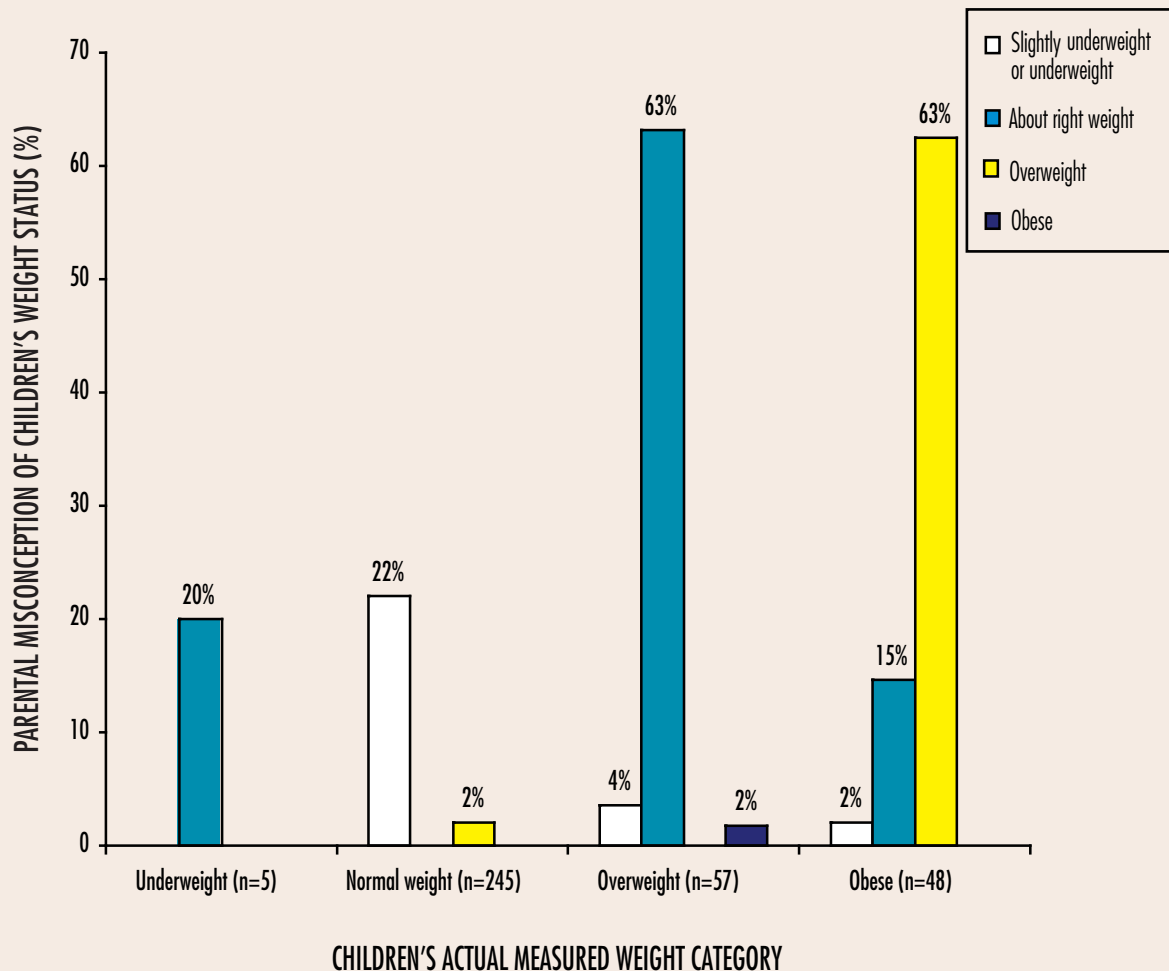
Second, the likelihood of misclassifying weight status seemed to be higher among non-white parents than among white parents in our study, although this influence of race or ethnicity was not detected by other researchers.^{21,26} A qualitative study showed that Latin-American women considered thinness more worrisome than fatness in children²⁹ and preferred their children to be plumper.³⁰ The limited sample size in our study did not allow comparisons among various non-white ethnic groups. Further study with a larger and more diverse sample might help identify which specific ethnic groups are more likely to misperceive their children's weight status.

Third, our study further confirms that overweight mothers were less aware of their children's excess weight problems than normal-weight mothers were.²¹ Low parental education levels and low family income have been found to increase the odds of misperceiving weight problems, although results of studies are conflicting on this point.^{12,21,25,26} In our study, education and income levels were not associated with parents' accuracy in identifying their children's weight status.

Since the health-related behaviour of school-aged children remains largely under the influence and control of their parents,^{31,32} it is unlikely we can effectively address the increasing childhood obesity epidemic without parents' awareness and understanding of its health consequences. From a public health standpoint, we need a mass media campaign to help the community at large to recognize this major public health problem. Efforts should be made to reach non-white and overweight parents specifically. The campaign should also draw parents' attention to boys' excess weight issues.

In Canada's universal primary health care system,³³⁻³⁵ family physicians and community pediatricians are the front-line health professionals seeing overweight children on a day-to-day basis. Health care professionals should be made aware of the potentially higher odds of misperceptions of their children's weight status among non-white or overweight parents, as well as parents' insensitivity to their sons' weight problems. Plourde³⁶ recently recommended that Canadian physicians assess children's and parents' “stage of change” when

Figure 2. Parents' misclassification rate by measured weight categories: X-axis is the children's actual measured weight status. Y-axis is the parents' misconception of their children's weight status. For example, 22% of normal-weight children were perceived as underweight by their parents, 63% of overweight children were perceived as about the right weight by their parents, and 63% of obese children were perceived as overweight by their parents.



counseling obese children. Effective but inoffensive strategies should be developed in primary health care settings to help parents recognize their children's weight problems. Parents' awareness and active involvement is key to family-oriented lifestyle changes, an essential step in pediatric weight management. In addition, education is needed for parents who perceive their normal-weight children as underweight, as their misperceptions could lead to overfeeding these children.

Limitations

This study surveyed a convenience sample of children in 7 elementary schools in just the Middlesex-London area, which might limit the generalizability of its results. Second, as all children in grades 4 to 6 were studied, there might be cluster effects on the outcome measures. Third, although 62% of children and 52% of parents

participated in the study, we had complete data on only 46% of parent-child pairs. The provincial privacy protection act would not allow us access to socioeconomic information on nonrespondents, so we were unable to determine whether there were differences between respondents and nonrespondents. There might have been a self-selection bias that would further undermine the generalizability of the study findings. Nonetheless, our results suggest that, as in other countries, Canadian parents are unconcerned about their school-aged children being overweight or obese.¹²⁻¹⁶

Conclusion

This study highlights the need for future research to explore effective strategies for helping busy physicians increase parents' awareness of their children's overweight and obese status and promote a healthy body

weight for all children. Increasing parents' awareness of their children's weight problems is the first step in preventing pediatric obesity. ❁

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Acknowledgment

We thank the Thames Valley District School Board and the London District Catholic School Board for allowing access to pupils in their elementary schools and the Child Health Team at the Middlesex-London Health Unit and Brescia University College nutrition students for assistance in school recruitment and data collection. This study would not have been possible without the support and involvement of school principals, teachers, and staff. Pupils' and parents' participation is very much appreciated. This study was funded by the Public Health Research Education and Evaluation Program of the Middlesex-London Health Unit in Ontario. Brescia University College provided salary support for the work-study students who did data entry and verification for the study.

Contributors

Dr He contributed to concept and design of the study, sought funding, oversaw data collection, analyzed and interpreted the data, and prepared the article for publication. **Ms Evans** contributed to data collection, participated in analysis and interpretation of data, prepared the tables and figures, and reviewed and approved the article for publication.

Competing interests

None declared

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References

1. Tremblay MS, Katzmarzyk PT, Willms JD. Temporal trends in overweight and obesity in Canada, 1981-1996. *Int J Obes Relat Metab Disord* 2002;26:538-43.
2. Lobstein T, Baur L, Uauy R. Obesity in children and young people: a crisis in public health. *Obes Rev* 2004;5(Suppl 1):4-104.
3. Hedley AA, Ogden CL, Johnson CL, Carroll MD, Curtin LR, Flegal KM. Prevalence of overweight and obesity among US children, adolescents, and adults, 1999-2002. *JAMA* 2004;291:2847-50.
4. Livingstone MB. Childhood obesity in Europe: a growing concern. *Public Health Nutr* 2001;4:109-16.
5. Magarey AM, Daniels LA, Boulton TJ. Prevalence of overweight and obesity in Australian children and adolescents: reassessment of 1985 and 1995 data against new standard international definitions. *Med J Aust* 2001;174:561-4.
6. Fagot-Campagna A. Emergence of type 2 diabetes mellitus in children: epidemiological evidence. *J Pediatr Endocrinol Metab* 2000;13(Suppl 6):1395-402.
7. Falkner B, Michel S. Obesity and other risk factors in children. *Ethn Dis* 1999;9:284-9.
8. Freedman DS, Dietz WH, Srinivasan SR, Berenson GS. The relation of overweight to cardiovascular risk factors among children and adolescents: the Bogalusa Heart Study. *Pediatrics* 1999;103:1175-82.
9. Harris SB, Perkins BA, Whalen-Brough E. Non-insulin-dependent diabetes mellitus among First Nations children. New entity among First Nations people of northwestern Ontario. *Can Fam Physician* 1996;42:869-76.
10. Birmingham CL, Muller JL, Palepu A, Spinelli JJ, Anis AH. The cost of obesity in Canada. *CMAJ* 1999;160:483-8.
11. Stanton B, Cole M, Galbraith J, Li X, Pendleton S, Cottrel L, et al. Randomized trial of a parent intervention: parents can make a difference in long-term adolescent risk behaviors, perceptions, and knowledge. *Arch Pediatr Adolesc Med* 2004;158:947-55.
12. Carnell S, Edwards C, Croker H, Boniface D, Wardle J. Parental perceptions of overweight in 3-5 y olds. *Int J Obes Relat Metab Disord* 2005;29:353-5.
13. Jeffery AN, Voss LD, Metcalf BS, Alba S, Wilkin TJ. Parents' awareness of overweight in themselves and their children: cross sectional study within a cohort (EarlyBird 21). *BMJ* 2005;330:23-4.
14. Etelson D, Brand DA, Patrick PA, Shirali A. Childhood obesity: do parents recognize this health risk? *Obes Res* 2003;11:1362-8.
15. Myers S, Vargas Z. Parental perceptions of the preschool obese child. *Pediatr Nurs* 2000;26:23-30.
16. Eckstein KC, Mikhail LM, Ariza AJ, Thomson JS, Millard SC, Binns HJ. Parents' perceptions of their child's weight and health. *Pediatrics* 2006;117:681-90.
17. Riffenburgh RH. *Statistics in medicine*. London, Engl: Academic Press; 1993.
18. Cameron N. *The measurement of human growth*. London, Engl: Croom Helm; 1984.
19. Kuczmarski RJ, Ogden CL, Grummer-Strawn LM, Flegal KM, Guo SS, Wei R, et al. CDC growth charts: United States. *Adv Data* 2000;314:1-27.
20. Dietitians of Canada, Canadian Paediatric Society, College of Family Physicians of Canada, Community Health Nurses Association of Canada. The use of growth charts for assessing and monitoring growth in Canadian infants and children. *Can J Diet Pract Res* 2004;65:22-32.
21. Baughcum AE, Chamberlin LA, Deeks CM, Powers SW, Whitaker RC. Maternal perceptions of overweight preschool children. *Pediatrics* 2000;106:1380-6.
22. Canning PM, Courage ML, Frizzell LM. Prevalence of overweight and obesity in a provincial population of Canadian preschool children. *CMAJ* 2004;171:240-2.
23. He M, Sutton J. Using routine growth monitoring data for the tracking of obesity prevalence in young children. *Can J Public Health* 2004;95:419-23.
24. Statistics Canada. *National longitudinal survey of children and youth: childhood obesity*. Ottawa, Ont: Statistics Canada; 2002.
25. Jain A, Sherman SN, Chamberlin LA, Carter Y, Powers SW, Whitaker RC. Why don't low-income mothers worry about their preschoolers being overweight? *Pediatrics* 2001;107:1138-46.
26. Maynard LM, Galuska DA, Blanck HM, Serdula MK. Maternal perceptions of weight status of children. *Pediatrics* 2003;111:1226-31.
27. Genovesi S, Giussani M, Faini A, Vigorita F, Pieruzzi F, Strepparava MG, et al. Maternal perception of excess weight in children: a survey conducted by paediatricians in the province of Milan. *Acta Paediatr* 2005;94:747-52.
28. Adams K, Sargent RG, Thompson SH, Richter D, Corwin SJ, Rogan TJ. A study of body weight concerns and weight control practices of 4th and 7th grade adolescents. *Ethn Health* 2000;5:79-94.
29. Crawford PB, Gosliner W, Anderson C, Strode P, Becerra-Jones Y, Samuels S, et al. Counseling Latina mothers of preschool children about weight issues: suggestions for a new framework. *J Am Diet Assoc* 2004;104:387-94.
30. Contento IR, Basch C, Zybert P. Body image, weight, and food choices of Latina women and their young children. *J Nutr Educ Behav* 2003;35:236-48.
31. Klesges RC, Stein RJ, Eck LH, Isbell TR, Klesges LM. Parental influence on food selection in young children and its relationships to childhood obesity. *Am J Clin Nutr* 1991;53:859-64.
32. Contento IR, Basch C, Shea S, Gutin B, Zybert P, Michela JL, et al. Relationship of mothers' food choice criteria to food intake of preschool children: identification of family subgroups. *Health Educ Q* 1993;20:243-59.
33. Fowler-Brown A, Kahwati LC. Prevention and treatment of overweight in children and adolescents. *Am Fam Physician* 2004;69:2591-8.
34. Shephard RJ. Role of the physician in childhood obesity. *Clin J Sport Med* 2004;14:161-8.
35. Wake MA, McCallum Z. Secondary prevention of overweight in primary school children: what place for general practice? *Med J Aust* 2004;181:82-4.
36. Plourde G. Preventing and managing pediatric obesity. Recommendations for family physicians. *Can Fam Physician* 2006;52:322-8.