

Parental perceptions of weight status of their children

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Original Article

Abstract

BACKGROUND: Understanding the knowledge, attitudes, and beliefs of parents is important for planning appropriately to control their children's weight. We aimed to study these variables in parents of normal, underweight, overweight, and obese children.

METHODS: This cross-sectional study targeted the parents of normal, underweight, overweight, and obese children, who were selected using multistage random sampling method. The parents' knowledge, attitudes, beliefs, and behaviors about the weight status of their children, weight management, obesity, diet, lifestyle, and related psychosocial factors were evaluated using a validated questionnaire. The questionnaire, which had been validated, consisted of 12 demographic, 8 knowledge, 19 attitude and beliefs, and 25 behavior questions. Mean knowledge, attitude and beliefs, and behavior scores were compared across three subgroups of parents. Student's independent t-test, ANOVA, and Kruskal-Wallis test were used to study the correlation between different demographic and socioeconomic factors, and the studied variables.

RESULTS: 90% of parents were aware that obesity is a disease, and 92% knew that eating too much fast food would lead to obesity in children. Only 5% assumed that obese children are healthier than non-obese children. The mean scores of the three subgroups showed no significant difference in knowledge, attitude and beliefs, and behavior. Families with fathers, whose education level was higher than high school diploma, rated their children's weight status as overweight or obese significantly less than families with fathers, whose education level was high school diploma or lower (8.5% vs. 16.5%, respectively, $P = 0.014$). Only 12% of parents tried to help their children lose weight at least once, and only 6% arranged sport activities for the family members. In 57% and 41% of families, the child, respectively, decided how much time was enough to watch TV, and how much chocolates and sweets to eat. 46% of children watched TV for more than 2 hours/day, and 49% of children watched TV while eating meals. The mean total score of boys' parents was significantly lower than that of girls' parents ($P < 0.05$). Families with low income, with no medical insurance, or not owning a house thought that the cost of registration in sport activities for children was too high ($P < 0.03$).

CONCLUSION: Some parents unreasonably rated the weight status of their children as overweight/obese. It is suggested that further studies be carried out to evaluate and improve parents' knowledge, attitudes, and behaviors regarding their children's weight.

Keywords: Children, Obesity, Overweight, Knowledge, Attitude, Belief, Behavior

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Introduction

The epidemic of obesity in children has become one of the main concerns in developed and many developing countries.¹⁻⁵ The prevalence of overweight (BMI of 85th to 95th percentile) and obesity (BMI > 95th percentile) in our country were about 5% and 10%, respectively.⁶ Childhood obesity is related to some chronic diseases in adulthood such as hypertension, diabetes mellitus, and cardiovascular disease.⁷⁻¹⁰ In addition, overweight and obese adults demonstrated less successful economic and social patterns.¹ Complex interactions of genetics, sedentary lifestyle, poor nutrition, and psychosocial and environmental factors are essential in inducing excess body weight in children around the world.^{1,11,12} Overweight and obese children are more likely to eat fatty and salty food, and spend more time watching TV rather than being physically active. They are also less likely to consume enough vegetables, fruits, and whole grains.¹³ Moreover, there are some psychosocial factors that endorse the risk of being overweight and obesity in children. For example, some parents believe that the larger the body size, the healthier the child. In other words, they are even satisfied with their children's obesity or overweight. Some parents also consider their overweight children as strong and/or solid.¹⁴ The social acceptance of being overweight leads to less pressure on children to lose weight. This results in less frequent seeking of appropriate weight management strategies. There are similar trends in many cultures. Understanding the thinking patterns of caregivers of overweight and obese children is the first step in the modification of their behaviors. Appropriate planning may also help to promote a healthier lifestyle in children, and to tackle the epidemic of obesity. The current study evaluated a sample of parents of normal, overweight, and obese children in order to assess their knowledge, attitudes, beliefs, and behaviors related to obesity and weight management in their children.

Materials and Methods

Sampling, Recruitment, and Data Collection

In 2011, a qualitative study was performed as the initial step of a large study, named TABASSOM study, on obesity determinants in adults and children. It was conducted to investigate the knowledge, attitudes, and behaviors toward obesity variables.¹⁵ Then a questionnaire was developed for adults and adolescents and validated to be used in this study.¹⁶ The current study has been approved by the Ethical

Committee of Isfahan Cardiovascular Research Center (a WHO collaboration center). 320 families were randomly selected through multistage random sampling after clustering urban health centers. They were randomly selected from each health center from the list of families with children aged 15 years and under. The parents were called, informed about the study, and asked if they were willing to take part in the study between January 2011 and December 2011. Appointments were made, and trained interviewers went door to door and completed the questionnaire. All participating parents gave their consents before enrollment in the study. Each questionnaire started with demographic and socioeconomic questions (family structure, parent's education, employment, family income, and medical insurance) followed by knowledge, attitude, beliefs, and behavior questions. Questions on barriers or facilitators of weight management strategies from the parents' points of view were included.

Measurement Tool, Development, Validity, and Reliability

The parents' knowledge, attitudes, beliefs, and behaviors about their children's weight and its management were measured using a validated instrument.¹⁶ The measurement tool was developed based on the literature review and qualitative study conducted previously.¹⁵ In brief, the qualitative study evaluated weight status, physical activity, and nutritional, environmental, and psychosocial issues affecting weight control in children. Textbooks, scientific literatures, and published questionnaires were also used to extract the questions. A panel of experts, including nutritionists and psychologists, was asked to review the instrument for content validity, accuracy, and suitability of different items.¹⁶ In order to check the face validity, a number of lecturers of the Social Medicine Department, Isfahan University of Medical Sciences (Isfahan, Iran) were asked to answer the questionnaire. The answers were prepared in scales or multiple choices. According to the recommendations and feedbacks of the expert panel and the lecturers, the items were either kept unchanged, removed, or revised. The modified instrument was pretested with 10 parents for readability and transparency of the overall questionnaire, items, answers, and scales. A few corrections were made according to the new feedbacks of parents. Cronbach's alpha coefficient of the questionnaire ranged between 0.6 and 0.8.¹⁶ The final questionnaire consisted of 12 demographic, 8 knowledge, 19 attitude and belief, and 25 behavior questions. The knowledge questions consisted of obesity and its relationship with the following factors:

diet quality, physical activity, psychosocial factors, obesity control and prevention, and associated diseases. Each knowledge question had three answers of true, false, and I don't know. Every correct answer was assigned 1 point, and every incorrect response or I don't know answer was assigned 0 points. Attitude and belief questions corresponded to the personal values and beliefs on 6 obesity related constructs of body image, diet, active or sedentary lifestyle and related cultural, educational issues, and psychosocial issues. The first 16 attitude and belief questions were assessed using five-point Likert scale answers, ranging from strongly agree to strongly disagree. The answers were given 1 to 5 points according to the correctness of the response. 3 other attitude and belief questions had favorable and unfavorable options, and were scored accordingly. Behavior questions represented behaviors of both parents and children evaluated by different questions in the following domains: physical activity and sedentary lifestyle, diet pattern, parent-child communication, and weight management education and interventions. The first 17 behavior questions had five-point Likert type scales, ranging from everyday to never. The correct behavior was given 5 points, and the other choices were ranked accordingly. The rest of the behavior questions were assessed according to the multiple choice answers. The correct response was given one point and other choices were given 0. The higher the scores, the higher the knowledge, right attitudes, correct beliefs, and appropriate behaviors.

Data Analysis

Frequency distributions of demographic and socioeconomic information of families and of the parental knowledge, attitudes, beliefs, and behavior patterns were determined. The scores of each section of knowledge, attitude and belief, and behavior and the total score for every person were calculated. Parents were divided into three subgroups based on their perceptions of children's weight status (underweight, normal weight, and overweight and obese). The mean knowledge, attitude and belief, and behavior scores among three subgroups and across different demographic and socioeconomic factors were compared using independent t-test, ANOVA, and Kruskal-Wallis. SPSS for Windows (Version 15; SPSS Inc., Chicago, IL., USA) was used for data analysis.

Results

Demographic and Socioeconomic Status

Parents of 146 boys and 139 girls participated in the study. The mean age of boys and girls were

9.6 ± 2.6 and 9.4 ± 2.7 , respectively. The age range of children was 5-14 years in both genders. 21%, 51%, and 28% of families had one, two, and three or more children, respectively. In 270 children, the father and mother were living together. 15 children lived with single parents (parents were divorced and separated in 5 and 3 cases, respectively) and one parent was not alive in 7 children. Five fathers and five mothers were illiterate (2%), whereas 157 fathers (56%) and 167 mothers (59%) had a high school diploma or college/university degree. 262 mothers were housewives. Monthly income was equal or less than US\$ 300 in 69 families, and equal or greater than US\$ 1000 in 3 families. 171 and 191 families owned a house and 1 or more cars, respectively. 221 families were covered by medical insurance.

Knowledge, Attitude and Belief, and Behavior about Obesity and Overall Health

Participating parents had a reasonable knowledge of obesity. About 90% knew that obesity is a disease, 91% were aware that it is possible to become obese at all ages, 89% knew that the possibility of becoming obese in adulthood is higher for obese children, and 95% were aware of the good chance of preventing childhood obesity. 98% knew that having a normal weight is important in maintaining children's overall health. 93%, 95%, and 96% were aware that obesity may lead to diabetes mellitus, cardiovascular diseases, and hypertension, respectively. When asked "Have you ever been informed about the risks of obesity and overweight in children?" 69% of parents responded yes. However, when the same question was asked about their children, the positive answer dropped to 40%. 54% of parents found their information about the risk of obesity through TV and radio, whereas in 32%, books, journals and newspapers were the sources of information.

Knowledge, Attitude and Belief, and Behavior about Obesity and Physical Activity

Although 91% of parents knew that children with less physical activity are more prone to become obese, only 6% arranged exercise and sport activities, such as walking and mountain climbing, for the family members. About 42% of parents talked to their children about the advantages of sport activities. In 57% of families, the child decided how much TV to watch and 46% of children watched TV for more than 2 hours per day. In 13% of families, the child worked on the computer for more than 2 hours per day. One-third of parents believed that the time of sport activities in their children's schools was not enough and

assumed that there was not enough space for sport activities in their children's schools. 28.5% of parents thought the children did not have enough time for sport activities because of the pressure of the school's science programs. Nearly half of the parents believed that the cost of registration of their children in sport activities was too high. Only the latter item was significantly different based on the sex of the child and the family's economic status. In other words, 58% of boys' parents and 39% of girls' parents believed that the cost of registration of children in sport activities was too high ($P = 0.001$). Furthermore, families with low income, no medical insurance, or those who did not own a house similarly thought that the cost of registration in sport activities for children was too high ($P < 0.03$).

Knowledge, Attitude and Belief, and Behavior about Obesity and Dietary Habits

About 92% of parents knew that eating too much fast food would lead to obesity in children. Although 34% thought not having fast food could be difficult for their children, only 5% and 13% declared that their children were regularly eating fast foods (such as pizza, or sandwich) and snacks (such as chips, cheese balls, biscuits, or chocolates). 52% stated that educational programs on appropriate nutrition were not frequently conducted in schools. 39% believed that selling some snacks such as chips and cheese balls in schools made their children consume them more frequently, and 53% thought that by their children's friends eating snacks their children ate more snacks. In 49% of families, the children watched TV while eating meals and 57% believed that TV advertisements on some snacks such as chips and cheese balls led the children to consume them more frequently. 65% of children were regularly eating breakfast, 81% were eating fruits every day, and 63.5% had healthy snacks such as bread and cheese, nuts, or dried fruits between the meals. 78% of parents selected the type of food consumed at home, 14% prepared fried food for their children, 3% chose chips, cheese balls, or chocolates to reward the children's good behavior, 25% locked some foods such as sweets or chocolates out of access of children, and 45.5% talked to children about the advantages of having healthy foods. In 41% of families, the child was authorized to decide how much chocolates and sweets to eat. Only the last item was significantly different based on father's education; in 36% of families with father's education of lower than high school diploma, and in 50% of families with father's education of higher than high school diploma, children were rarely or never authorized to decide

how much chocolate and sweets to eat ($P < 0.02$).

Knowledge, Attitude and Belief, and Behavior about Obesity and Psychosocial Issues

About 72% of parents believed that children of obese parents are more probable to become obese. Only 5% assumed that obese children are healthier than non-obese children. 79% believed that obesity caused the isolation of children from other children at school, 83% thought obese children might become depressed and 81% assumed that obesity might decrease self-confidence in children. When asked "How important is the normal weight of your child to you and your spouse?" 96% and 87% responded it is very important to me, and it is very important to my spouse, respectively. The parents ratings of their children's weight status was very interesting; 25% of parents rated their children as thin or very thin, 62% considered them to be about the right weight, and only 13% selected overweight or obese as the body shape of their children. Only 12% had tried to help their children lose weight. Of the latter group (35 children) the parents of 16 children consulted with a nutritionist or a medical doctor to get help on reducing the child's weight. 11 children lost weight with no return, and 9 lost weight and regained the weight. The following methods were used by this group of children to lose weight: diet (12 children), exercise (7 children), and both (16 children). When asked "Which one of the following behaviors was more difficult to control for your child?" the answers were as follows: self-regulation of eating (14 children), exercise (4 children), and both (7 children).

Comparison of Knowledge, Attitude and Belief, and Behavior Scores

Few significant differences were found between the knowledge, attitude and belief and behavior scores across different demographic and socioeconomic factors (Table 1). The mean scores of knowledge, attitude and belief, and behaviors were not significantly different between boys' parents and girl's parents. However, the mean total score of boys' parents was significantly lower than that of girl's parents ($P < 0.05$). Families with fathers' education of lower than high school diploma had significantly lower mean knowledge, behavior, and total scores than those of families with fathers' education of high school diploma or higher (Table 1).

One question evaluated the parents' perception on their children's weight status. The mean scores of the three subgroups (underweight, normal weight, and overweight and obese) were compared and no significant difference in knowledge, attitude and beliefs, behaviors, and total scores were found among them (Table 2).

Table 1. Mean knowledge, attitude and beliefs, behaviors, and total scores across various demographic and socioeconomic factors

Demographic and socioeconomic factors		Knowledge		Attitudes and beliefs		Behavior		Total	
		Scores	P	Scores	P	Scores	P	Scores	P
Sex of child*	Boys	0.90 ± 0.14	0.7	0.76 ± 0.13	0.08	0.51 ± 0.15	0.08	0.69 ± 0.09	0.03
	Girls	0.91 ± 0.13		0.78 ± 0.13		0.54 ± 0.16		0.72 ± 0.09	
Number of children in the family	One	0.87 ± 0.15	0.15**	0.75 ± 0.14	0.31**	0.52 ± 0.13	0.49**	0.69 ± 0.08	0.15***
	Two	0.91 ± 0.12		0.78 ± 0.13		0.53 ± 0.16		0.71 ± 0.09	
	≥ Three	0.91 ± 0.13		0.77 ± 0.11		0.51 ± 0.17		0.69 ± 0.11	
Father education*	< High school diploma	0.88 ± 0.15	0.02	0.76 ± 0.14	0.07	0.49 ± 0.15	0.01	0.68 ± 0.10	0.001
	≥ High school diploma	0.92 ± 0.12		0.79 ± 0.12		0.54 ± 0.15		0.72 ± 0.09	
Family income	≤ 300,000	0.87 ± 0.16	0.2**	0.75 ± 0.13	0.3**	0.53 ± 0.16	0.3**	0.69 ± 0.09	0.4***
	301,000-600,000	0.91 ± 0.12		0.78 ± 0.13		0.53 ± 0.15		0.71 ± 0.09	
	≥ 601,000	0.89 ± 0.13		0.77 ± 0.15		0.53 ± 0.18		0.70 ± 0.11	
Number of automobiles*	≥ 1	0.90 ± 0.13	0.8	0.78 ± 0.12	0.2	0.52 ± 0.15	0.35	0.70 ± 0.09	0.8
	0	0.90 ± 0.14		0.75 ± 0.15		0.54 ± 0.16			
House*	Owned	0.89 ± 0.16	0.5	0.78 ± 0.12	0.35	0.51 ± 0.15	0.2	0.71 ± 0.10	0.6
	Not owned	0.91 ± 0.13		0.76 ± 0.14		0.54 ± 0.16		0.71 ± 0.09	
Medical insurance*	Yes	0.91 ± 0.13	0.1	0.77 ± 0.13	0.97	0.53 ± 0.16	0.1	0.71 ± 0.09	0.1
	No	0.88 ± 0.16		0.77 ± 0.16		0.49 ± 0.15		0.69 ± 0.09	

* Independent t-test was applied.

** Kruskal-Wallis test was used.

*** ANOVA was employed.

Table 2. Comparison of mean and/or median scores of knowledge, attitudes and beliefs, and behaviors across three subgroups of parental ratings of children's weight status

Parental perception of children's weight status	Knowledge scores			Attitudes and beliefs scores			Behavior scores			Total scores	
	Median (IQR)	Mean ± SD	P	Median (IQR)	Mean ± SD	P	Median (IQR)	Mean ± SD	P	Mean ± SD	P
Underweight (n = 71)	0.87 (0.75, 1)	0.88 ± 0.15	0.37	0.79 (0.71, 0.86)	0.77 ± 0.14	0.99	0.5 (0.37, 0.64)	0.51 ± 0.16	0.46	0.69 ± 0.1	0.55
Normal (n = 177)	1 (0.87, 1)	0.91 ± 0.13		0.79 (0.71, 0.86)	0.77 ± 0.13		0.5 (0.43, 0.64)	0.53 ± 0.15		0.71 ± 0.09	
Overweight and Obese (n = 37)	1(0.87, 1)	0.93 ± 0.09		0.79 (0.71, 0.86)	0.77 ± 0.13		0.5 (0.36, 0.64)	0.49 ± 0.17		0.69 ± 0.08	

Moreover, parental perception about children's weight status had no significant relationship with the sex of the child or the number of children in the family. However, families with fathers' education of lower than high school diploma rated their children's weight status as overweight or obese significantly less than families with fathers' education of high school diploma or higher (8.5% vs. 16.5%, respectively, $P = 0.014$).

Discussion

Although some parents enrolled in this study had overweight or obese children, the majority of parents didn't think that their children were either overweight or obese. This finding is important given that parents had good or very good knowledge about obesity and its health related consequences. They were aware that obesity is a disease, causes psychosocial problems in children, and leads to chronic diseases later in life. Furthermore, the majority of the subjects stated that their children consumed fruits and vegetables every day, and two-thirds ate breakfast and healthy snacks, regularly. However, in half of the families, the children watched TV while eating meals, a finding that may explain the high level of overweight and obesity in our society.⁵ The Ministry of Health has banned TV advertisement on non-healthy snacks in Iran which further helps reduce the consumption of non-healthy snacks. However, the effect of international media including internet, and satellites may be more effective. Overall, some parents were not able to recognize the correct body shape of their children in the current study. Therefore, they were not expected to intervene to modify the children's, and probably their own, unhealthy lifestyles and to treat this disease. That's why only 12% had ever tried to help their children lose weight. Parents' underestimation or misperception of children's weight status has also been demonstrated by other studies.¹⁷⁻³⁵ This finding seems more important when we learn that the scores of knowledge, attitude and beliefs, and behaviors of parents who perceived their children as overweight and obese in the current study were not significantly different than those who rated their children's weight as normal or underweight. It seems that increase in knowledge of parents is not enough for them to perceive the correct weight status, and prevent or treat overweight or obesity in their children. Some researchers gave three reasons for parental misperception of children's weight status; gender-based different viewpoints of parents,

ethnic-based different perspectives, and low education and income levels.^{14,21,32} Our study demonstrated no difference between the parents of boys and girls in rating the children's weight status. The level of income of parents also caused no difference in parental rating of children's body shape. A previous local research found that overweight children were significantly more prevalent in average-income families than in high-income families, and in lower-educated mothers than in higher-educated ones in our city.⁵ In the current study, the higher the level of education of fathers, the higher the possibility of rating the weight status of children as overweight or obese.

Overweight and obesity in children are prevalent in our country.^{5,6,36-40} Furthermore, their prevalence decreased significantly in girls, though it increased in boys following the interventional activities of the Heart Health Promotion from Childhood as one of the ten interventional projects of the Isfahan Healthy Heart Program.^{12,41,42} Body weight increases gram by gram and obesity develops very slowly. Thus, its development in children might not be noticeable for parents. They see their children every day since their birth. Day to day weight increase in children is not large enough for parents to perceive in day to day interaction with them. For parents, the child's body shape today is similar to the picture taken yesterday. Many parents have a fixed image of the child in their minds which is most often a healthy portrait. They do not see what the health care providers see.³³ Some parents do not see the ongoing increase in weight unless it is acute. Acute changes or events are perceived immediately but chronic ones are not. As long as the children have a good appetite, do not complaint of any symptoms, and are active in their school homework, the parents' attention may not be directed towards their body shape.¹⁴ Some parents do not care about the gradual weight changes of their children.²¹ On the other hand, parents may know obesity but may not be able to diagnose it; because they may either compare their children with extreme cases of obesity or assess their weight status visually. They do not trust or use clinical measures.²⁷ Besides, parents know fever and cough but cannot easily diagnose whether they are due to common cold, sinusitis, bronchitis, or pneumonia. Increase in weight is a sign not a symptom. People come to the medical doctor with symptoms whereas the signs are mostly picked up by doctors. The information on symptoms and signs directs the doctor towards correct diagnosis. Obesity is not a symptom or sign,

but a disease. It is probably too much to expect of parents to diagnose this disease given their various responsibilities and stresses. Overweight and obesity can be detected actively by health care providers rather than passively by the parents. It is important to mention that the results of the current study demonstrated that only 40% of parents were educated about the risks of obesity in their children. It seems that the main focus on overweight and obesity detection might shift from families to schools. Teachers or school health care providers could be continually educated on this issue. They probably can easily detect overweight and obesity and inform the parents about the weight status of their children in a non-stigmatizing and non-offensive way.⁴³ This can raise the parents' concerns about this issue. The parents are aware of the long-term consequences of obesity on biopsychosocial aspects of their children's lives and they know that they can largely shape the lifestyles of their school-aged children.^{44,45} As soon as parents acknowledge the children's overweight or obesity they can start appropriate interventions. In other words, although the parents are principal keys in weight management of children, they need assistance and guidance by public health programs to successfully perceive the problem. Increasing the knowledge and awareness of parents is important and should be continued but to translation this knowledge into perception needs further practical strategies. Otherwise, underestimation of the weight status of children by their parents will be an important barrier in preventing the epidemic of obesity among children.

Conclusion

Recognition of the correct body shape of children by parents needs special attention. Further action-oriented studies are necessary to build practical steps in order to improve the practice and behaviors of parents towards tackling the epidemic of overweight and obesity in their children.

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Conflict of Interests

Authors have no conflict of interests.

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