

Factors Associated With Parental Readiness to Make Changes for Overweight Children

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ABSTRACT. *Objective.* The prevalence of childhood obesity is increasing in the United States. However, it has been difficult to help children successfully lose weight and maintain weight loss. Parental involvement in this effort is important. Currently, little is known about parents' readiness to make behavior changes to help their children lose weight. The objective of this study was to describe demographic factors and parental perceptions associated with parents' readiness to make weight-reducing lifestyle changes for their overweight and at-risk-for-overweight children.

Methods. A total of 151 parents of children who were aged 2 to 12 years and had BMIs \geq 85th percentile for age and gender completed a 43-item self-administered questionnaire. Parental stage of change, defined as precontemplation stage, contemplation stage, and preparation/action stage, was determined using an algorithm involving current parental practices and future intentions. Parents in the preparation/action stage were considered to be ready to make behavior changes to help their child lose weight. Maximum-likelihood multinomial logistic regression was used to identify demographics and perceptions associated with parental stage of change.

Results. Sixty-two percent of the children had a BMI \geq 95th percentile. Their mean age was 7.5 years, and 53% were male. Of the 151 parents, 58 (38%) were in the preparation/action stage of change, 26 (17%) were in the contemplation stage, and 67 (44%) were in the precontemplation stage. Factors associated with being in the preparation/action stage of change were having overweight or older (\geq 8 years) children, believing that their own weight or child's weight was above average, and perceiving that their child's weight was a health problem. After controlling for multiple factors, having an older child (odds ratio [OR]: 2.99; 95% confidence interval [CI]: 1.18–7.60), believing that they themselves were overweight (OR: 3.45; 95% CI: 1.36–8.75), and perceiving that their child's weight was a health problem (OR: 9.75;

95% CI: 3.43–27.67) remained significantly associated with being in the preparation/action stage of change.

Conclusions. Several demographic factors and personal perceptions are associated with a parent's readiness to help his or her child lose weight. Knowledge of these factors may be beneficial to providers and program developers when addressing pediatric overweight with parents and initiating new interventions. *Pediatrics* 2005; 116:e94–e101. URL: www.pediatrics.org/cgi/doi/10.1542/peds.2004-2479; *childhood obesity, stage of change, parental perceptions.*

ABBREVIATIONS. OR, odds ratio; CI, confidence interval.

Approximately 10% of children who are aged 2 to 5 years and 15% of children who are aged 6 to 11 years in the United States are overweight (defined as having a BMI \geq 95th percentile for age and gender).¹ In the past 30 years, these rates have doubled for children aged 2 to 5 and nearly tripled for children aged 6 to 11. Among black and Hispanic children, these rates are even higher.^{2,3} Although some interventions have been successful in initiating weight loss in children, most interventions have had limited success with long-term maintenance.^{4,5} Assessing a person's readiness to change his or her behaviors and targeting the intervention to this level of readiness may improve these rates.

Behavior modification techniques are often used in weight management programs to promote lifestyle changes around diet, exercise, and sedentary activities.^{6–8} Because mothers typically play an important role in determining what food is available for their children and shaping eating and activity-related behaviors,^{9–11} it is not surprising that behavior modification programs that involve parents, particularly mothers, have more of an impact than those that do not.^{12,13} Assessing a parent's readiness to make lifestyle and dietary changes therefore may be an important step toward helping children lose weight.

The concept of "readiness to change" was first described by Prochaska and colleagues in the transtheoretical model and its stages of change.^{14,15} According to this model, there are 5 stages of behavior change that categorize the transition from having no interest in changing behavior to maintaining such changes after they are made (Table 1). People who are in the preparation stage are defined as "ready to change" because they are more likely to initiate change for themselves in the following month com-

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TABLE 1. Stages of Change

| Stage of Change | Description of Stage |
|------------------------|--|
| Precontemplation stage | No interest in changing behaviors in the next 6 mo |
| Contemplation stage | Thinking about making a change but not soon |
| Preparation stage | Intending to make a change in the next month |
| Action stage | Making changes |
| Maintenance stage | Maintaining changes for at least 6 mo |

pared with people who are in the precontemplation or contemplation stages. This model has been validated in adults across a variety of health behaviors, including weight control and reducing dietary fat,^{16,17} smoking cessation,^{15,18} alcohol use,¹⁹ and preventive health behaviors.²⁰ Although this model has been applied to individual patients, it has never been used to examine a parent's readiness to change behaviors for his or her child.

This study is the first to examine parents' stage of change as it relates to changing behaviors for their child. We focused on parents of children aged 2 to 12 years because of the increased parental involvement in a child's growth and development during this period. We were specifically interested in the socio-demographic factors and parental perceptions that were associated with being in the preparation and action stages of change. By understanding the factors associated with being more ready to change, physicians and other health care providers may be able to adjust their interactions with patients and intervene more appropriately. In addition, interventions that target the different levels of parental readiness to change can be developed.

METHODS

Study Design and Population

We conducted a cross-sectional survey of a convenience sample of parents/guardians of children who attended an inner-city, hospital-based pediatric practice in North Philadelphia between September 1 and December 31, 2003. Parents of children who were between the ages of 2 and 12 and were at risk for overweight (BMI \geq 85th percentile but $<$ 95th percentile for age and gender) or overweight (BMI \geq 95th percentile for age and gender) were asked to complete a survey before seeing a physician. When $>$ 1 child per family had a BMI \geq 85th percentile, the parent was asked to complete the survey for the child who was scheduled to see the doctor first. Parents were excluded when the child required gastric-tube feeds; had a chronic medical condition that affected his or her weight or ability to eat independently; or was being treated with chronic steroids, chemotherapy, or immune suppressants.

A 43-item self-administered questionnaire, available in English and Spanish, was developed and piloted by the investigators (available on request). Patients were enrolled consecutively, during all 5 days of the workweek, when investigators were available. Trained study investigators also obtained consent from parents/guardians and assent from children who were older than 5 years. The study was approved by the institutional review boards at Drexel University College of Medicine and St Christopher's Hospital for Children.

Study Measures

The survey was designed to obtain demographic information about the child and the parent as well as information about parental beliefs and behaviors. Parental perceptions regarding the child's weight and their own weight were rated on a 5-point Likert scale ranging from "very underweight" to "very overweight."

Additional questions determined whether parents thought that their child's weight was a health problem or obesity in general was a health problem. Finally, parents were asked to recall whether their doctor had had any discussions with them about their child's weight.

The outcome measure was parent's stage of change. An algorithm based on that presented by Kristal et al.²¹ was used to determine parent's stage of change (see Fig 1). Questions in the algorithm included whether parents were "thinking about making lifestyle changes to help [their] child lose weight" and "how likely [they were] to make changes in the next 6 months." Questions regarding specific behavior changes, for example, decreasing fruit juice consumption, changing to low-fat or skim milk, increasing fruit and vegetable consumption, increasing physical activity levels, and decreasing the amount of time spent watching TV or playing on the computer, were used to determine which parents were actively making changes. Parents who were consistently making behavior changes, defined as $>$ 50% of the time, in any of the previously listed areas were categorized as being in the action stage of change. On the basis of the transtheoretical model and its stages of change, parents who were in the preparation stage of change were considered "ready to make a change."

Data Analysis

Analyses were performed using Stata 7.0 for Windows (College Station, TX). All categorical data were analyzed using χ^2 tests and logistic regression. Maximum-likelihood multinomial logistic regression was used to examine the relationship among demographic characteristics, parental perceptions, and stage of change. The referent group consisted of parents who were in the precontemplation stage of change. Stratified analysis by child gender was also performed. Standard demographic variables and all variables that were significant at the $P \leq .10$ level in the contemplation and preparation/action stages of change were placed in a multivariate multinomial logistic-regression model. In addition, 2-way interaction terms of parental perceptions of their own weight and either perceptions of their child's weight or whether this was a health problem for their child were tested for statistical significance. Backward stepwise regression with maximum-likelihood ratio testing was performed for model selection. Variables were retained when they had a P value of $\leq .10$.

RESULTS

Between September 1 and December 31, 2003, 1708 children who were aged 2 to 12 presented to the clinic for a health maintenance visit. Among them, 545 (32%) were identified as having a BMI \geq 85th percentile for age and gender. During the study period, 187 children and their parents were approached for enrollment. Thirty-two (17%) parents refused for reasons listed in Fig 2. Of the 155 parents who were recruited for the study, 4 did not respond to the questions that assessed readiness to change and were excluded from the analysis, thus leaving 151 parent-child dyads.

More than half (62%) of the children in the study were overweight (Table 2). The mean age of the children was 7.5 years, and there were slightly more boys than girls (53% vs 47%). Most children in this study were black (44%) or Latino (51%). Most parental respondents were female (88%); had a high school degree or less (82%); and received public assistance in the form of food stamps, the Special Supplemental Nutrition Program for Women, Infants, and Children or the Temporary Assistance for Needy Families Program (72%). Approximately half (47%) of the parents viewed themselves as being overweight.

Nine parents were in the action stage of change, and 49 were in the preparation stage. These groups were combined for analysis because interventions and discussions with health care professionals

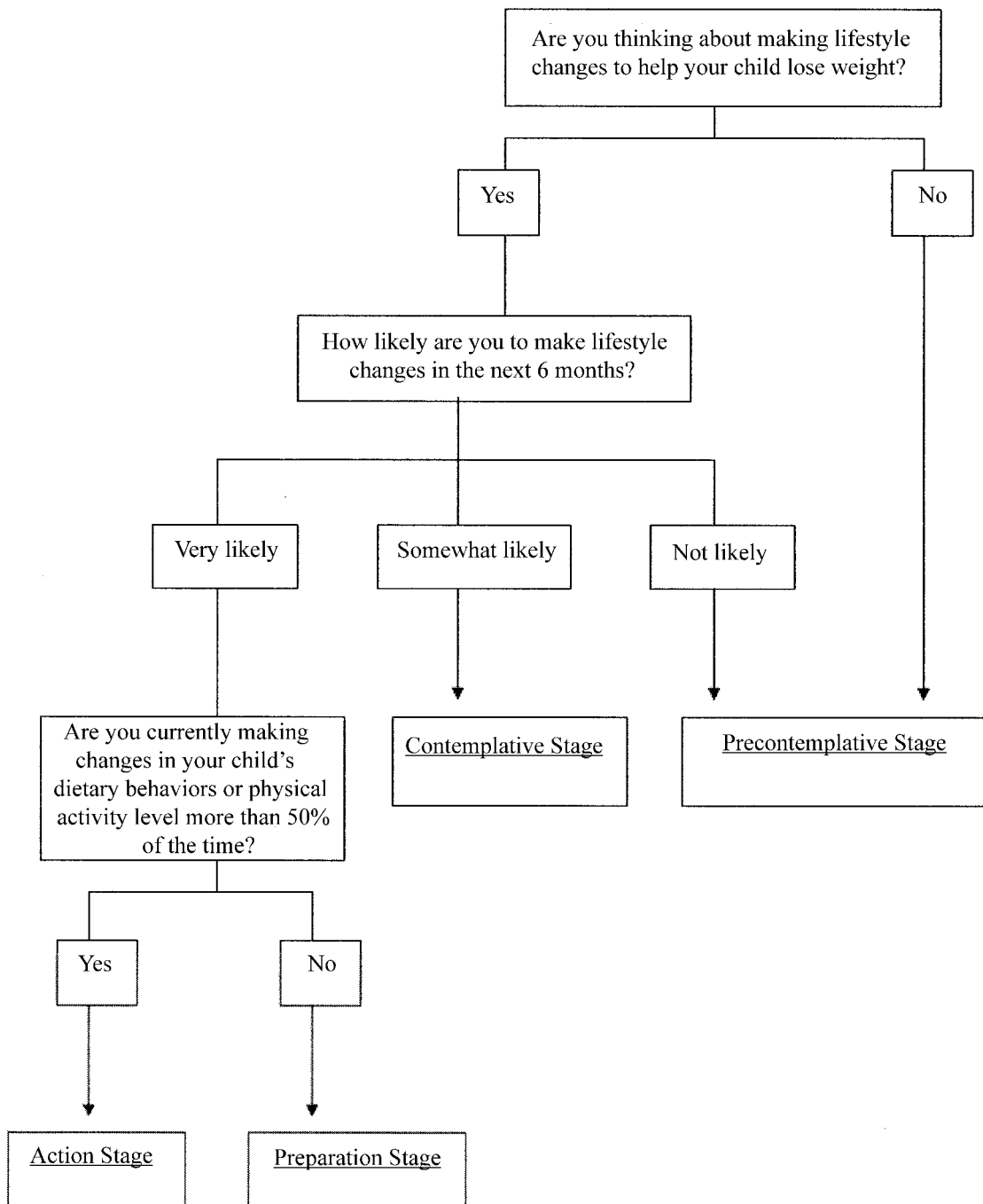


Fig 1. Algorithm for assigning parental stage of change.

would have similar characteristics. Thus, 38% of parents were in the preparation/action stage of change. Twenty-six (17%) parents were in the contemplation stage, and 67 (44%) were in the precontemplation stage. Numerous significant associations were found among sociodemographic variables, parental perceptions, and parent's stage of change (Table 3). Parents of overweight children, compared with parents of at-risk-for-overweight children, had an odds ratio (OR) of 4.54 (95% confidence interval [CI]: 2.07–9.93) for being in the preparation/action stage of change versus the precontemplation stage. Parents of older children (8–12 years), compared with parents of younger children, also had significantly higher odds

(OR: 3.73; 95% CI: 1.77–7.86) of being in the preparation/action stage of change rather than the precontemplation stage. There were no differences on the basis of child gender, ethnic/racial group, or parental receipt of federal assistance. Stratified analysis by child gender also revealed no effect modification. When parental perceptions were examined, parents who thought their child's weight was a health problem had 16.0 times the odds of being in the preparation/action stage (95% CI: 6.33–40.33). Parents who perceived themselves to be overweight had higher odds of being in the contemplation stage (OR: 7.39; 95% CI: 2.66–20.51) than being in the preparation/action stage of change (OR: 3.86; 95% CI: 1.82–8.18).

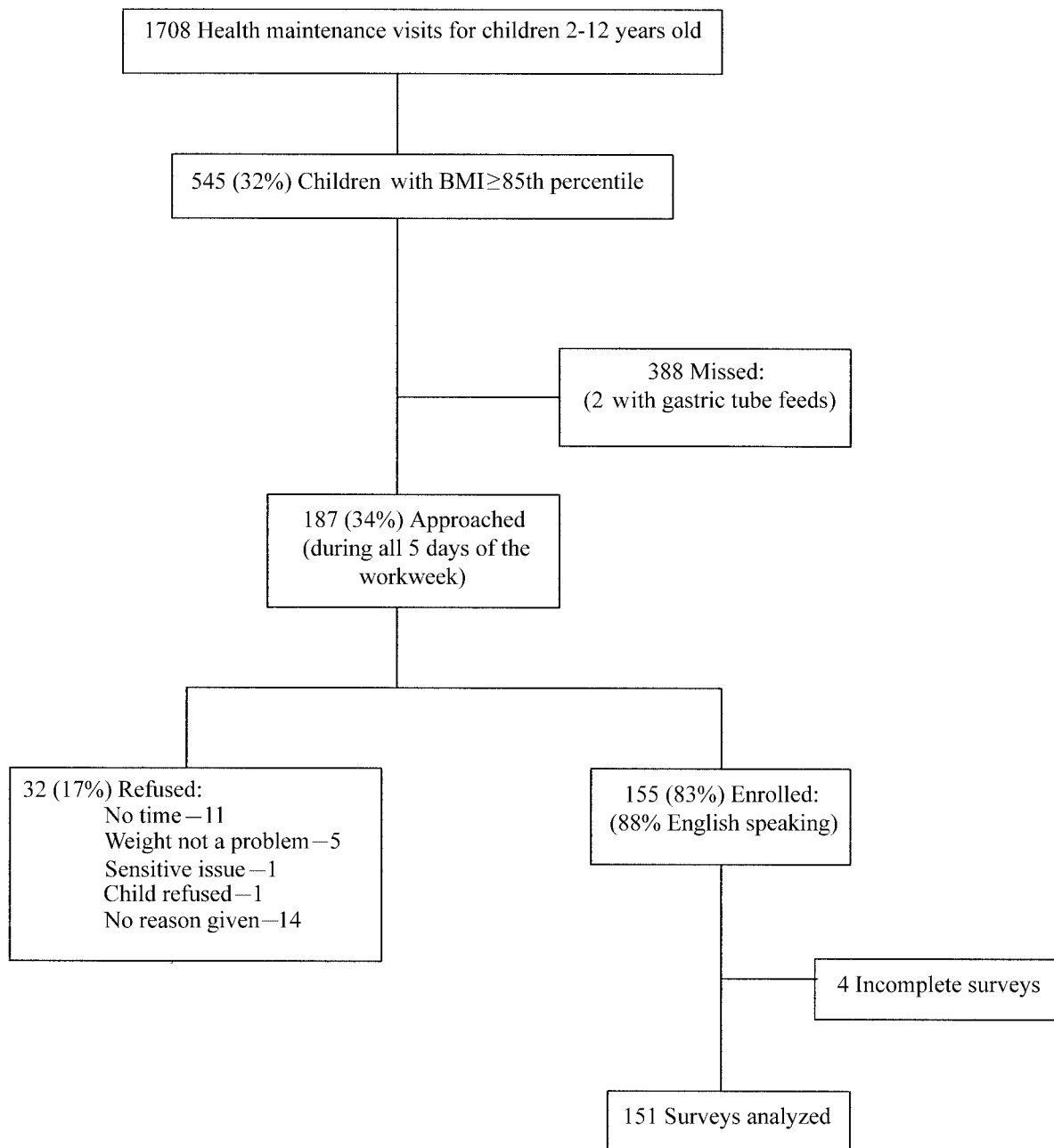


Fig 2. Flow of participants in the study.

Finally, when the child's doctor had commented that the child's weight was a health problem, the odds that the parent would be ready to make a change increased to 10.80 (95% CI: 3.78–30.86).

In the multivariate multinomial logistic-regression analysis, the odds of being in the preparation/action stage of change were increased when the child was ≥ 8 years of age (OR: 2.99; 95% CI: 1.18–7.60) or the parents thought that their child's weight was a health problem (OR: 9.75; 95% CI: 3.43–27.67; Table 4). The odds of being in the preparation/action stage were also increased when the parents rated themselves as being overweight (OR: 3.45; 95% CI: 1.36–8.75). Whether the doctor made a comment about the child's weight was not statistically significant in the multivariate analysis. However, among parents who

thought that their child's weight was a health problem, 56% reported that their doctor had made a comment about their child's weight, whereas only 8% of parents who did not think that their child's weight was a health problem reported that the doctor had made a comment ($P < .001$). The remaining variables and interaction terms were not statistically significant. Overall, this model explained 24.6% of the variance in parental stage of change.

DISCUSSION

In this study, we examined the relationship among sociodemographic factors, parental perceptions, and a parent's readiness to make lifestyle changes for his or her overweight or at-risk-for-overweight child. Important factors associated with parental readiness

TABLE 2. Demographic Information of Children and Parents

| Sample Characteristics | <i>n</i> (%) (<i>N</i> = 151) |
|---------------------------------|--------------------------------|
| Child demographics | |
| BMI | |
| 85th–95th percentile | 58 (38) |
| ≥95th percentile | 93 (62) |
| Age | |
| 2–7 y | 70 (46) |
| 8–12 y | 81 (54) |
| Gender | |
| Male | 80 (53) |
| Ethnic group | |
| Black | 67 (44) |
| Latino | 77 (51) |
| Other | 7 (5) |
| Parent demographics | |
| Gender* | |
| Female | 131 (88) |
| Age* | |
| ≤24 y | 20 (14) |
| 25–29 y | 47 (34) |
| 30–39 y | 47 (34) |
| ≥40 y | 24 (17) |
| Education* | |
| Less than high school | 61 (41) |
| High school graduate | 61 (41) |
| Some college | 26 (18) |
| Marital status* | |
| Single | 97 (66) |
| Married, divorced, or separated | 51 (34) |
| Receiving public assistance* | |
| Yes | 106 (72) |
| No | 42 (28) |
| Perception of own weight | |
| Underweight or average weight | 80 (53) |
| Overweight | 71 (47) |

* *N* varies because of missing values.

to make changes included older age of the index child and beliefs that their child's weight was a health problem. With as much as 30% of the patient population being overweight or at risk for overweight,¹ interventions that emphasize the immediacy of the health problems associated with childhood obesity may have more of an impact on parents. Physicians and program developers can also use this information to encourage parents to take action sooner, when children are more amenable to change.

Another factor that had an impact on parents' readiness to change was whether they perceived themselves to be overweight. However, the odds of being in the preparation/action stage was half that of being in the contemplation stage. One can hypothesize that other, more personal factors, such as failed experiences with diets and exercise programs, detracted from parents' motivations and prevented them from moving on to a more active stage of change. In addition, overweight parents may believe that their child's overweight status has a genetic cause and therefore is not amenable to change. Discovering why these parents are not ready to make a change may help clinicians to assist parents to become more active in their child's weight loss efforts and eventually break the cycle of familial overweight.

It is also interesting to note that physician's comments were not significant in the multivariate analysis. Nevertheless, many parents who thought that

their child's weight was a health problem also reported that their doctor had made a comment about their child's weight. This result suggests that doctors and other health care providers may have a strong influence on whether parents understand the health risks associated with childhood overweight. We cannot specify, however, the causal relationship between these variables because of the cross-sectional nature of the study; parents may have realized that their child's weight was a health problem only after the doctor had made a comment, or the doctor's comments simply may have reinforced what they were beginning to recognize or already knew. Although providers are likely to play an important role in helping parents to understand the health risks of childhood overweight, future prospective studies will be better able to evaluate the influence of a doctor's involvement in motivating parents to change.

In our study, we examined factors that were associated with parental readiness to make a change. Knowledge of these factors can help providers and program developers tailor their interactions and interventions more appropriately, but other factors or perceptions that may act as barriers to change also need to be addressed. Baughcum et al²² showed that low-income mothers believe that having a larger child indicates that the child is healthy and that they are good parents. Other low-income mothers believe that children can outgrow their overweight status and that a child is not overweight unless he or she is inactive or having social problems in school.²³ Cultural attitudes may also play a role. Fitzgibbon et al²⁴ showed that black and Hispanic women do not become dissatisfied with their body image until they are well above the Centers for Disease Control and Prevention's standards of overweight. Although not studied specifically, these beliefs and cultural references most likely have a negative impact on a parent's readiness to change behaviors. To be more effective, interventions should address these misperceptions and work within different cultural frameworks to help parents become ready to make behavior changes.

In addition to family and cultural beliefs, situational barriers that prevent parents from becoming more active in their child's weight loss efforts may exist. Haas et al²⁵ showed that children of parents with less education and lower income levels are more likely to be overweight. Other studies suggest that these demographic factors are associated with an adult's real and perceived ability to carry out behavior changes, such as eating more fruits and vegetables.^{26,27} Providers may find that exploring situational barriers to change and working with parents to overcome them may help to move parents through the stages of change.

There are several limitations in this study. First, the study population consisted of a convenience sample of eligible parents and children, leading to selection bias. However, the majority (83%) of parents who were approached agreed to participate, and parents were enrolled consecutively during all 5 days of the workweek. In addition, the cross-sectional design of the study was a limitation, prohibit-

TABLE 3. Association Among Sociodemographic Factors, Parental Perceptions, and Parental Stage of Change

| | Stage of Change | | | | | | Preparation/Action Stage | | Contemplation Stage | | Preparation/Action Stage | |
|--|---------------------------|------|--|------------------------|------|--|-----------------------------|------|---------------------|-------------|--------------------------|-------------|
| | Precontemplation (N = 67) | | | Contemplation (N = 26) | | | Preparation/Action (N = 58) | | Contemplation Stage | | Preparation/Action Stage | |
| | n | % | | n | % | | n | % | OR | 95% CI | OR | 95% CI |
| Child's BMI \geq 95th percentile | 29 | 43.3 | | 19 | 73.1 | | 45 | 77.6 | 3.56 | 1.32-9.59* | 4.54 | 2.07-9.93† |
| Child's age \geq 8 y | 25 | 37.3 | | 16 | 61.5 | | 40 | 69.0 | 2.69 | 1.06-6.83* | 3.73 | 1.77-7.86† |
| Child's gender male | 35 | 52.2 | | 15 | 57.7 | | 30 | 51.7 | 1.25 | 0.50-3.11 | 0.98 | 0.48-1.98 |
| Child's ethnicity, black‡ | 29 | 43.3 | | 8 | 30.8 | | 30 | 51.7 | 0.55 | 0.21-1.48 | 1.25 | 0.62-2.63 |
| Parent's age§ | | | | | | | | | | | | |
| 25-29 y | 19 | 31.7 | | 8 | 33.3 | | 20 | 37.0 | 1.37 | 0.34-5.51 | 4.56 | 1.12-18.56* |
| 30-39 y | 23 | 38.3 | | 8 | 33.3 | | 16 | 29.6 | 1.13 | 0.28-4.49 | 3.01 | 0.74-12.32 |
| \geq 40 y | 5 | 8.3 | | 4 | 16.7 | | 15 | 27.8 | 2.60 | 0.46-14.63 | 13.00 | 2.59-65.20† |
| Parental education | | | | | | | | | | | | |
| High school graduate | 31 | 46.3 | | 11 | 42.3 | | 19 | 34.6 | 0.87 | 0.33-2.32 | 0.72 | 0.32-1.60 |
| Some college | 9 | 13.4 | | 4 | 15.4 | | 13 | 23.6 | 1.09 | 0.28-4.30 | 1.70 | 0.61-4.68 |
| Marital status¶ | | | | | | | | | | | | |
| Married, divorced, or separated | 50 | 75.8 | | 15 | 60.0 | | 32 | 56.1 | 2.08 | 0.78-5.54 | 2.44 | 1.13-5.26* |
| Receiving public assistance | 48 | 72.7 | | 18 | 69.2 | | 40 | 71.4 | 1.18 | 0.44-3.20 | 1.06 | 0.48-2.36 |
| Being overweight is a health problem | 39 | 58.2 | | 21 | 80.8 | | 46 | 79.3 | 3.02 | 1.01-8.96* | 2.75 | 1.24-6.12* |
| Child's weight is a health problem | 8 | 11.9 | | 12 | 46.2 | | 39 | 68.4 | 6.32 | 2.17-18.38† | 16.00 | 6.33-40.33† |
| Parent's perception of child as overweight | 16 | 24.2 | | 16 | 64.0 | | 41 | 71.9 | 2.04 | 1.29-3.22† | 2.08 | 1.46-2.96† |
| Parent's perception of him- or herself as overweight | 18 | 26.9 | | 19 | 73.1 | | 34 | 58.6 | 7.39 | 2.66-20.51† | 3.86 | 1.82-8.18† |
| Doctor made a comment | 5 | 7.7 | | 8 | 30.8 | | 27 | 47.4 | 5.33 | 1.55-18.34† | 10.80 | 3.78-30.86† |

Bivariate multinomial logistic regression was performed. Precontemplation stage is the reference group in all analyses.

* $P \leq .05$.

† $P \leq .01$.

‡ Reference is "other" race, which primarily consists of the Latino group.

§ Parental age \leq 24 years is the reference group.

|| Parental education less than high school is the reference group.

¶ Reference is "never married."

TABLE 4. Multivariate Multinomial Logistic Regression: Child Demographic Factors and Parental Perceptions Associated With Parental Stage of Change

| | Contemplation Stage | | Preparation/Action Stage | |
|--|---------------------|------------|--------------------------|------------|
| | OR | 95% CI | OR | 95% CI |
| Child's BMI \geq 95th percentile | 3.42* | 1.03–11.37 | 2.62† | 0.98–7.02 |
| Child's age \geq 8 y | 2.61† | 0.88–7.76 | 2.99* | 1.18–7.60 |
| Being overweight is a health problem | 3.36† | 0.99–11.43 | 2.54† | 0.94–6.84 |
| Child's weight is a health problem | 3.39† | 0.94–12.27 | 9.75‡ | 3.43–27.67 |
| Parent's perception of him- or herself as overweight | 7.23‡ | 2.40–21.73 | 3.45‡ | 1.36–8.75 |

Multivariate model using backward stepwise logistic regression with maximum-likelihood ratio testing for model selection. Precontemplation stage is the reference group for outcome. Model includes variables listed above and parental age, education, marital status, receipt of public assistance, parent's perception of child's weight, doctor made a comment, interaction between parent's perception of his or her own weight and child's weight, and interaction between parent's perception of his or her own weight and child's weight is a health problem. Variables with a $P \leq .10$ were kept in the model. Pseudo R^2 for this model is 0.246.

* $P \leq .05$.

† $P \leq .10$.

‡ $P \leq .01$.

ing any inferences of causality. Yet several factors were significant, and future prospective studies may be able to clarify the causal relationship of these and other factors. Third, the study population was predominately inner-city Latino and black, therefore limiting the generalization of these results to other populations. However, published literature regarding minority parents' understanding and approach to weight loss is limited. Additional knowledge about motivating factors in these at-risk populations may help health care providers to communicate the problem and solutions more effectively. Finally, the multivariate multinomial logistic-regression model could explain only 24.6% of the variance. This indicates that variables that were not measured in the study contribute to a parent's readiness to change.

This study sheds light on some of the factors associated with a parent's readiness to help his or her child lose weight. Frequently, providers broach this subject with their patients and parents without determining whether the parents are ready to make behavior changes or even think that their child is overweight. From previous literature, it is known that physicians do not always feel confident in their skills when addressing this matter with parents.²⁸ Understanding whether a parent is ready for this discussion can be key to creating a nonantagonistic and productive interaction. Moreover, understanding which factors are associated with parental behavior change may help physicians feel more confident when trying to motivate parents. Finally, parental perceptions of their own weight, not only their child's weight, are important in the process of change. By assessing a parent's thoughts on this matter, providers will understand whether there are other, more personal issues that are influencing the parent's view of being overweight and readiness to make changes.

CONCLUSIONS

To date, no published studies have investigated parental readiness to make changes to help their child lose weight. In this study, we found that par-

ents are more likely to be ready when the child is \geq 8 years of age. Furthermore, belief that their child's weight is a health problem or recognition that they as parents are overweight is associated with readiness to make changes for their child. Because pediatricians and other health care providers are uniquely positioned to influence parental perceptions, understanding the factors that are associated with a parent's readiness to make environmental changes to help his or her child lose weight will help them to communicate more effectively with their patients' parents. In addition, knowledge of these factors may inform the development of more focused public health campaigns and interventions in the future.

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