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Wanting to and Doing So: Parental Intent to Change Weight Does Not Translate Into Behavior

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Abstract

Objective: Because poor parental recognition of overweight is so common in young children, we sought to determine whether demographics or family behaviors differed in children whose parents were actively trying to reduce excess weight in their child compared with those who were unaware there was an issue.

Methods: Parents of 271 overweight (body mass index≥85th) children aged 4-8 years completed questionnaires on demographics, weight, feeding practices, social desirability, dietary intake, and home food availability. Children wore accelerometers over 7 days to measure physical activity/inactivity.

Results: 113 parents (41.7%) classified their child as overweight, 96 (35.4%) indicated at least some concern, but only 66 (24.4%) parents were trying to (probably or definitely) change their child's weight. In total, 56 children met all three criteria. These children were older, heavier and more likely to be female (P<0.001), but did not differ in socioeconomic status (P=0.614), maternal education (P=0.615), or ethnicity (P=0.051), compared to the remaining children. Few differences in feeding practices were observed, except for higher food restriction in those trying to change their child's weight (P<0.001). These children were significantly less physically active (P=0.033) and more sedentary (P=0.002) than the other children. Despite strong intent to change the diet (P<0.001), this did not translate to differences in home food availability or dietary intake. Social desirability was also not related to efforts to change.

Conclusion: Parental awareness of excess weight in young children and attempts to address the issue do not appear to translate into healthier behaviors in the home.

Keywords: Overweight; Perception; Concern; Motivation; Behavior; Parent

Introduction

Despite a high prevalence of childhood overweight and obesity worldwide [1,2] the majority of parents fail to recognise the presence of overweight in their offspring [3]. This is particularly apparent in young children, where up to 86% of parents of 2-6 year olds are unaware their child is overweight [4]. This lack of awareness has been attributed to many factors including societal shifts in body weight norms elevating what people believe is overweight [5,6] and fear of stigmatisation associated with use of the words such as obese [7]. In particular, parents of young children do not see excess weight as an issue until it really starts to impede their physical health or social interactions [8].

Recognising that there is a weight issue is considered the first step in the appropriate treatment of overweight [9] and has led to calls to increase parental awareness of excess weight in young children [10]. Feedback of weight status improves parental recognition of overweight in some [11-13] but not all [14] studies. However, whether improved perception results in actual behavior change is not well understood. Several studies report greater intent to change behavior following feedback [11,13-15]. However these studies generally rely on parental reports of planning to or having made changes to family diet or physical activity or use brief questions about reported frequency of behaviors, rather than more objective or intensive measures of behavior. Such measures may be affected by response bias such as answering in a socially desirable way [16].

We recently undertook a weight screening initiative in preparation for a family-based obesity intervention [17]. Our extensive compilation of baseline measures included indicators of social desirability, objective measures of physical activity from accelerometry, and measures of the home food environment. Because awareness of excess weight is unlikely to be sufficient to instigate behavior change [10,18,19], we were interested in determining whether aspects of parenting and child behavior that might influence weight differed in families where the parent was aware their young child is overweight and were actively trying to change it, compared with those who were not cognisant of this fact.

Methods

This analysis involved Phase 1 of our Motivational Interviewing and Treatment (MInT) study, which investigated different methods for informing parents that their young child was overweight or obese after a weight screening initiative. The study has previously been described in detail [20], and these analyses refer just to those children identified as overweight or obese via screening. For the remainder of this paper, overweight refers to both overweight and obese. Ethical approval was obtained from the Lower South Regional Ethics Committee (LRS/09/09/039) and all parents gave informed consent.

Screening

All families enrolled at 9 participating general practices or attending secondary care clinics across two time periods (March 2009 – March 2010 and January 2011 – May 2011) with children aged 4-8.99 years were invited to participate in a comprehensive health check. Children were excluded if they had severe childhood arthritis, severe asthma, cystic fibrosis, inflammatory bowel disease, congenital or chromosomal abnormalities, severe developmental delay, on medication that may influence body composition, or their families were not planning to remain in the region for the next two years.

Duplicate measures of height (Leicester Height Measure) and weight (Tanita BC-418) were obtained following standard techniques, and body mass index (BMI) calculated. BMI z-scores were obtained using USA reference data [21]. Questionnaires on demographics, beliefs about the child's weight, parental attempts to change behavior, the presence of a television in the child's bedroom, parental feeding practices, and social desirability were completed at screening before the parents were informed of the weight status of their child (Table 1). Maternal BMI was obtained in 97% of mothers (3% missing), with 49% from duplicate measurements in the clinic, and 48% from self-reported data.

At screening – before feedback	Number with data	Reference	Question used or explanation about the method
Household deprivation	262	[37]	Uses household address to calculate NZDep, a measure of deprivation assigned to an area based on population criteria such as income, housing and qualifications
Child ethnicity	265	NZ Census questions (www.stats.govt.nz)	Use prioritized ethnicity as recommended if more than one ethnic group identified: Māori; Pacific Island; New Zealand (NZ) European and others.
Maternal education	268	NZ Census questions (www.stats.govt.nz)	Categorized into secondary, tertiary qualification (not university degree); university degree; and other.
Parental perceived child weight	271		Compared to other children of the same age and sex, how would you rate your child's weight? Answers: underweight, a little underweight, about right, a little overweight, overweight
Parental concern about child weight	270		How concerned are you about your child's weight? Answers not at all concerned, not concerned, a little concerned, quite concerned, very concerned.
Parental attempts to change behavior	271	[38]	3 questions (I am trying to improve my child's diet, I am trying to increase my child's physical activity, I am trying to change my child's weight) answered on an 11-point scale ranging from 0 (definitely not) to 11 (definitely). Answers were dichotomised at 8 to indicate actively trying to change behavior.
Television in bedroom	271		Does your child have a television in their bedroom? (yes / no)
Parental feeding practices	271	[39]	Four factors of interest: healthy eating guidance (how much a parent teaches, models and encourages healthy eating), monitoring (how much a parent keeps track of the unhealthy food that the child consumes), restriction (how much the parents restricts the child's food intake) and child control (how much the child determines which food is consumed and when).
Social desirability	139	[40]	Assessed in a random sample of participants (n = 139) using the 13-item short form of the Marlowe-Crowne Social Desirability Scale (MCSDS), where higher scores indicate more socially desirable responses
At baseline intervention appointment – after feedback			
Television use at dinner	203		Does your family have a rule that the television must be turned off when having dinner? (yes / no)
Family dinner	203		How many days over the last week did the family/household sit down to eat dinner together? 8 answer options ranging from no days to every day
Dietary intake	202	[30]	29 questions assessing intake patterns over the past week for which intake is recommended (fruit, vegetables, water, reduced fat products) or discouraged (high fat/sugar foods/non-core foods, sweetened beverages and full fat dairy products), yielding scores for fruit and vegetables, non-core foods, and sweet beverages.
Home food availability	200	[41]	Modified to be suitable for the NZ environment. Parents indicate which of 200 foods or food groups they have present in their house on a random day, yielding scores for fruit and vegetables, and non-core foods availability.

Physical activity and sedentary time	197	ActiGraph (GT3X) accelerometers	Worn 24 hours a day for 7 consecutive days. All sleep time was removed from the files using filters in MeterPlus before analysis of time in moderate-vigorous physical activity (MVPA) and sedentary activities.[42]

Table 1: Details regarding the questionnaires and measures used

Baseline intervention appointment

1093 children were screened of which 271 were found to be overweight (BMI > 85th percentile of US reference data) [21]. Parents of these children received feedback about their child's weight status and were subsequently invited into a two-year intervention [17]. Those agreeing to participate (n = 203, 75%) attended a baseline intervention appointment. Additional measures of family habits, dietary intake, and availability of food in the home were obtained in this sub-sample of children (Table 1). These children also wore an ActiGraph accelerometer for a week to provide an objective measure of physical activity and inactivity as indicated.

Statistics

The data were divided into three groups according to their response to questions about perception, concern and attempts to change weight. Regression analysis was used to compare the continuous variables, logistic regression for the binomial variables and multinomial logistic regression for the nominal variables. Because the sample was selected from medical practices the sandwich estimator was used to adjust the standard error. The Bonferroni inequality (p/3) was used to compare the groups for which the overall test was significant ($P < 0.05$). All analyses were undertaken using Stata Release 12 (College Station, TX: StataCorp LP).

Results

Table 2 describes the demographics of the study sample. The children were predominantly European, with 61% being overweight and 39% being obese. Children came from homes with a wide range of household deprivation, despite more than half of all mothers being tertiary educated. As might be expected in a sample of overweight and obese children, maternal BMI was high, with 77 (30.0%) mothers being overweight and a further 103 (40.0%) classified as obese.

	Category	Total
Girls n (%)		150 (55.3%)
Age (years)		6.4 (1.4)
Ethnicity[a] n (%)	NZ European and others	195 (73.6%)
	Maori	50 (18.9%)
	Pacific	20 (7.5%)
Level of household deprivation[b] n (%)	Low	97 (37.0%)
	Medium	94 (35.9%)
	High	71 (27.1%)
Maternal BMI[c] (kg/m^2)		29.1 (6.2)
Maternal education[d]	Secondary school only	105 (39.2%)
	Tertiary qualification (not University)	56 (20.9%)
	University degree	91 (34.0%)
	Other	16 (6.0%)
Height (cm)		120.7 (11.2)
Weight (kg)		28.7 (7.8)
BMI z-score		1.61 (0.45)
Weight status	Overweight n (%)	166 (61.3%)
	Obese n (%)	105 (38.7%)
Data are expressed as mean (SD) or n (%) as indicated Data were missing for 6[a], 9[b], 13[c] and 3[d] participants		

Table 2: Characteristics of the study population

Despite an average BMI z-score of +1.61 in these children, 138 parents (50.9%) thought their child was normal weight, were not concerned about their weight and were making no attempts to change it (Table 3). At the other end of the spectrum, 56 parents (20.7% overall) correctly identified the child as overweight and were concerned about the weight, but also said they were "probably" or "definitely" trying to change the child's weight. This was reduced even further to only 9.2% of the sample (n = 25) if "definitely" was used as the indicator of actively trying to change weight. Of the remaining 76 children, the majority knew their child was overweight (n = 54), but were not trying to change it, even though half of these parents indicated they were concerned (n = 25, Table 3).

	Incorrect perception		Correct perception	
	Not concerned	Concerned	Not concerned	Concerned
Not trying to change weight[a]	138	12	29	25
Trying to change weight[b]	4	3	3	56
Data refer to n [a]Refers to score of 0-5 (definitely not to maybe), and [b]6-10 (probably to definitely).				

Table 3: Relationship between perception of weight status, concern about weight and whether parents are actively trying to change the child's weight

We next examined differences in demographics and behaviors between three groups of children according to whether parents i) perceived them as overweight, ii) were concerned about it, and iii) were probably or definitely trying to change it (Table 4). Children of parents who reported no (n = 138, 50.9%) to all three indicators (group

1) were compared to with children whose parents reported yes to all three indicators (group 3, n = 56, 20.7%) or to one or two indicators (group 2, n = 76, 28.0%). Children in group 3 were older (P < 0.001), heavier (P < 0.001), and more likely to be female (P = 0.001) and have mothers with higher BMI values (P = 0.005) than children in the other two groups. However, socioeconomic status did not differ whether measured by the household deprivation index (P = 0.614) or maternal education (P = 0.615, Table 4).

Some differences in parental feeding practices were observed. Restriction of food was higher in families trying to change (P < 0.001), but few differences in healthy food guidance or child control were observed. Relatively few children had televisions in their bedroom (23%) and rules around television use did not vary by group. Children whose parents reported yes to all three indicators had children who were significantly less active (P = 0.033) and more sedentary (P = 0.002). Large differences were also observed in terms of parental intent to change the child's diet (P < 0.001). However, this intent did not translate to differences in the types of food available in the home, or to the intake of fruit, vegetables, non-core foods or sweet drinks. This dichotomy between intent and behavior was not explained by social desirability, which was unrelated to efforts to change (Table 4).

Variable	Category (if relevant)	Positive response to perception, concern or attempts to change weight			
		None Group 1	At least one Group 2	All three Group 3	P[a]
n		138	76	56	
Age (years)		6.0 (1.4)*	6.5 (1.4)†	7.2 (1.3)§	< 0.001
Ethnicity n (%)	NZ European and others	100 (72.5%)	57 (75.0%)	38 (67.9%)	0.051
Index of deprivation		5.1 (2.8)	5.2 (2.9)	4.8 (2.9)	0.614
Maternal education n (%)	With University degree	50 (36.5%)	25 (33.3%)	16 (29.1%)	0.615
Maternal BMI (kg/m^2)		28.5 (6.1)*	30.0 (6.2)†	29.4 (6.6)*†	0.005
Sex n (% female)		66 (47.8%)*	46 (60.5%)*†	38 (67.9%)†	0.001
Child BMI z-score		1.40 (0.30)*	1.67 (0.41)†	2.05 (0.49)§	< 0.001
Parental feeding practices	Healthy eating guidance	4.3 (0.5)*	4.2 (0.6)†	4.3 (0.5)*	0.029
	Restriction	1.9 (0.6)*	2.3 (0.7)†	2.7 (0.7)§	< 0.001
	Child control	2.3 (0.6)	2.2 (0.6)	2.4 (0.7)	0.064
Family rules[b] n (%)	TV off during dinner (yes)	47 (51.6%)	28 (45.2%)	26 (52.0%)	0.600
	TV in child's bedroom (no)	108 (78.3%)	60 (78.9%)	42 (76.4%)	0.926
Home food availability[b]	Fruit and vegetables	31.2 (10.1)	30.1 (8.1)	28.7 (8.9)	0.137
	Non-core foods	13.7 (5.9)	13.8 (6.5)	13.9 (4.0)	0.959
Dietary intake[b]	Fruit and vegetable score	14.0 (4.0)	13.5 (4.0)	13.7 (4.0)	0.552
	Non-core foods score	2.6 (1.0)	2.4 (0.9)	2.7 (0.9)	0.079
	Sweet drinks score	0.8 (1.0)	1.0 (1.5)	1.0 (1.2)	0.410
Accelerometry data[b]	Counts per minute	694 (217)*	619 (153)†	568 (164)†	0.033
	Sedentary time (hours/day)	8.9 (1.2)*	9.4 (1.1)†	9.8 (1.2)†	0.002
Trying to improve child's ...	Diet	6.0 (2.8)*	7.1 (2.4)†	8.6 (1.7)§	< 0.001
	Physical activity	5.3 (2.4)*	6.5 (2.2)†	8.2 (1.7)§	< 0.001
	Weight	0.9 (1.3)*	3.3 (2.4)†	8.3 (1.3)§	< 0.001
Social desirability[c]		8.5 (2.3)	8.8 (2.3)†	8.5 (2.8)§	0.670

Data presented as mean (SD) or n (%) as indicated. Logistic or multinomial logistic analysis with robust standard errors to account for the sample selection was used to examine differences between the groups. [a]If the overall P < 0.05, different superscripts within the same line indicate significant differences between groups using Bonferroni's post-hoc test. Data limited to those who [b]entered intervention (n = 203) and in a [c]random sub-sample (n = 139).

Table 4: Differences in demographic and behavioral variables in relation to parental views about the child's weight

Discussion

Recognition that a weight issue exists is considered an important first step in treating overweight [9]. However, our results would suggest that even when parents correctly recognise their child's overweight, and are actively trying to make changes to their child's weight, few differences in weight-related behaviors are apparent compared with children whose parents are not aware or concerned that their young child is overweight.

Similarly, few differences in demographic variables existed between children whose parents were making attempts to change their weight and those who were not. Children were of similar ethnicity, and came from homes with comparable levels of deprivation and maternal education, although some variation in maternal body size was apparent. Not surprisingly, parents were more invested in their child's weight when the child was older and heavier. However, parents of girls were also more likely to be trying to change the weight of their child than parents of sons, despite no significant sex difference in BMI z-score (data not shown). This sexual dimorphism in perception [22] or concern [23] about overweight in children is thought to be a consequence of differing social values and greater acceptance of overweight in boys relative to girls [24].

The premise behind increasing parental awareness of excess weight in children is that it would encourage appropriate behavior change, perhaps through changes in food availability or opportunities for activity within the home and wider environment. Yet few studies have actually examined whether this is the case in children [11,13-15] or adolescents [7]. While most studies have indicated some parental-reported behavior changes [11,13-15], these have generally been small and inconsistent, and reliant on brief crude assessments of behavior (usually single questions). However even with more comprehensive measures of dietary intake and home food availability, our results demonstrated no differences in actual food intake or in the types of food available in the home in children whose parents were trying to change their child's weight. This is important given that studies have consistently shown that the types of food at home influence food intake in children [25-27] and perhaps body weight [28]. This lack of differentiation may have occurred for several reasons. First, it is possible that our measure of dietary intake was still too crude, given that only small imbalances in daily energy balance are required to produce weight gain over time [29]. However, the questionnaire has been deemed to be both valid and reliable for children, at least for the fruit and vegetable and non-core food subscales [30]. Perhaps more importantly, our study was cross-sectional; it is possible that parents had already made improvements to both intake and availability, prior to this measurement occasion, which therefore will not be reflected in our findings.

By contrast, differences in some parental feeding practices and physical activity were apparent by group. No differences were observed in the degree of control children were allowed over their food intake (child control), and differences for healthy eating guidance were small and inconsistent. This is important given it might be expected that parents who were actively trying to change their child's weight would report higher parental role modelling (healthy eating guidance), than parents who did not believe their child's weight to be an issue. The main difference observed was greater degrees of food restriction (e.g. denying children treat foods) in parents who were actively trying to change the weight. Although early work linked restriction with weight gain [31,32], it is now apparent that parents use restriction as a way of controlling an overweight child's food intake [33]. This seems to occur despite recommendations advising against using restrictive feeding practices in children [34]. An unintended side effect of weight feedback could be increases in parental food restriction; only one study appears to have examined this and reported that restriction did increase after feedback, but in overweight girls only [14]. Our data also demonstrate that children whose parents were actively trying to change behavior were less physically active and more sedentary than the two other groups of children. However, in our sample, BMI z-score and physical activity (measured as counts per minute) were correlated ($r = -0.251$, $P < 0.001$). Once counts per minute were adjusted for sex and BMI z-score, these differences between the groups were no longer apparent (data not shown).

We were specifically interested in children whose parents were not only aware of their child's weight status, but also concerned enough to act on it. Previous research has demonstrated that parents can be aware of the child's excess weight, but do not perceive it to be a concern, and therefore perhaps actionable, until the relative weight is markedly higher than what health professionals would classify as overweight (e.g. BMI greater than the 85th percentile) [10]. Even at a BMI at the 99th percentile, only 50% of parents of 6-8 year old children would be concerned about their child's weight [35]. The future risk of overweight in children also appears to be a more deciding factor for parents in initiating behavior change than the child's current weight [18,19].

There are several limitations to our study. As mentioned, the cross-sectional nature of our study means that we cannot determine whether the lack of effect for several variables is a result of no true differences, or because parents have previously made significant changes, prior to our study. While this is possible, it seems unlikely given that many comprehensive interventions fail to produce major effects on behavior [36]. Second, not all measurements were obtained in all participants and some measures were obtained prior to feedback of weight status (demographics, parental attempts to change behavior, social desirability, feeding practices) and others approximately one month after feedback (dietary intake, home food availability, accelerometry). However, the presence of significant differences was not a function of timing, and we have previously demonstrated that feedback did not influence most of these outcomes [17]. There are also several strengths of our study. Rather than simply examining awareness or concern about weight, we specifically queried whether parents were actively trying to change their child's weight, which does not appear to have been examined before. Second, we have more extensive measures of dietary intake and home food availability than have been used previously, and obtained objective measures of physical activity using

accelerometry. Any differences we did observe were also not related to social desirability, which should negate the chances of response bias [16].

Conclusion

In conclusion, parental awareness of excess weight in young children and even attempts to address the issue do not appear to translate into healthier behaviors in the home. These parents may even be using some behaviors that are likely to produce an adverse effect on future weight (restriction) rather than an advantageous one. These findings indicate the need for research examining parental understanding about how to address overweight in young children, and perhaps improved public health messages which target a multi-pronged approach to obesity prevention for families.

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Clinical Trial Registration

Australian New Zealand Clinical Trials Registry ACTRN12609000749202

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