

Parental motivation to change body weight in young overweight children

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Abstract

Objective: To determine what factors are associated with parental motivation to change body weight in overweight children.

Design: Cross-sectional study.

Setting: Dunedin, New Zealand.

Subjects: Two hundred and seventy-one children aged 4–8 years, recruited in primary and secondary care, were identified as overweight (BMI \geq 85th percentile) after screening. Parents completed questionnaires on demographics; motivation to improve diet, physical activity and weight; perception and concern about weight; parenting; and social desirability, prior to being informed that their child was overweight. Additional measures of physical activity (accelerometry), dietary intake and child behaviour (questionnaire) were obtained after feedback.

Results: Although all children were overweight, only 42 % of parents perceived their child to be so, with 36 % indicating any concern. Very few parents (n 25, 8 %) were actively trying to change the child's weight. Greater motivation to change weight was observed for girls compared with boys ($P=0.001$), despite no sex difference in BMI Z-score ($P=0.374$). Motivation was not associated with most demographic variables, social desirability, dietary intake, parenting or child behaviour. Increased motivation to change the child's weight was observed for heavier children ($P<0.001$), those who were less physically active ($P=0.002$) and more sedentary ($P<0.001$), and in parents who were more concerned about their child's weight ($P<0.001$) or who used greater food restriction ($P<0.001$).

Conclusions: Low levels of parental motivation to change overweight in young children highlight the urgent need to determine how best to improve motivation to initiate change.

Keywords
Motivation
Obesity
Child
Perception
Concern

Effective treatment of obesity in children requires parents to recognise that excess weight is an issue and be motivated to make lifestyle changes to improve weight. This is potentially more successful at younger ages when parents maintain some control over the family food and activity environment and before lifestyle habits have become entrenched⁽¹⁾. Unfortunately it is well established that parents of young children do not recognise overweight in their offspring^(2,3). In fact, excess weight may only be viewed as a concern once it is at the level of impeding physical functioning or the child is being bullied about his/her size⁽⁴⁾.

Concepts central to motivation include perceived importance of the issue, confidence to change and the

ability to actually do so⁽⁵⁾. However, while motivation is regarded as a critical prerequisite for encouraging behaviour change⁽⁶⁾, factors that may influence parental motivation for changing their child's weight have rarely been studied. Research to date suggests that parents categorised as making preparations for, or actively engaged in, change are more likely to have older children, believe that their child's weight is a health problem or be overweight themselves, compared with parents who are not interested in change⁽⁷⁾. Even when parents of obese children indicate strong concern about their child's weight (importance) and are ready to make diet and activity changes (readiness), their confidence in their ability to actually do so is markedly lower⁽⁸⁾. This has important

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implications for success given that confidence in the ability to do well is a significant predictor of treatment completion and early weight loss, whereas importance and readiness are not related⁽⁹⁾. Parental motivation for weight loss is also known to be a predictor of treatment uptake^(10,11). How to increase motivation is therefore of importance, yet we know little about what factors determine motivation in parents for changing weight in their overweight children.

Motivation can be measured in a variety of ways. The Motivational Screening Measure (MSM) was developed as a simple tool to quickly assess motivation for behaviour change in the clinical setting. The MSM consists of three questions which assess key facets of motivation: importance, ability and commitment to change the behaviour of interest⁽⁵⁾. We recently undertook a major weight-screening initiative where we measured parental motivation for changing weight in young children prior to knowledge about the child's weight status⁽¹²⁾. The aim of the present study was to determine what factors were associated with parental motivation to change body weight in a community sample of children aged 4–8 years identified as overweight through screening.

Experimental methods

The present analysis involved Phase 1 of our Motivational Interviewing and Treatment (MInT) study⁽¹³⁾, which assessed parental responses to different styles of weight feedback after a weight-screening initiative⁽¹²⁾. The study has previously been described in detail⁽¹³⁾, but information relevant to the present analysis is described here. Ethical approval was obtained from the Lower South Regional Ethics Committee (LRS/09/09/039) and all parents gave informed consent.

Health check appointment

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

Duplicate measures of height (Tanita portable stadiometer) and weight (Tanita BC-418) were obtained following standard techniques. BMI was derived and Z-scores calculated⁽¹⁴⁾. Questionnaires on demographics,

motivation, parenting, social desirability and beliefs about the child's weight were completed before the parents were informed of the weight status of their child. Household structure, child ethnicity and socio-economic status were assessed using questions from the New Zealand census (www.stats.govt.nz). Socio-economic status was determined using the New Zealand Deprivation index (NZDep), which is a measure of deprivation assigned to an area based on population criteria such as income, housing and qualifications⁽¹⁵⁾. Maternal height and weight were measured in duplicate at the health check appointment where possible (49%), were self-reported (48%) or missing (3%).

Miller and Johnson's⁽⁵⁾ MSM assessed three constructs of motivation in parents, namely importance ('It is important for me to...'), ability ('I could...') and commitment ('I am trying to...'), in relation to three behaviours: increasing their child's physical activity, improving their child's diet or changing their child's weight. Each of the nine questions was answered on an 11-point scale, where: 0 and 1 = 'definitely not'; 2, 3 and 4 = 'probably not'; 5 = 'maybe'; 6, 7 and 8 = 'probably'; and 9 and 10 = 'definitely'. Parental feeding practices thought to influence child weight were assessed using five constructs⁽¹⁶⁾ from the Comprehensive Feeding Practices Questionnaire⁽¹⁷⁾. Parenting practices were indicated by the Parenting Scale⁽¹⁸⁾, with higher scores indicating more ineffective parenting practices (possible range: 1–7). For example, in response to 'When I give a fair threat or warning...' the parent would indicate 'I often don't carry it out' (score of 7) compared with 'I always do what I said' (score of 1). Social desirability was assessed in a random sample of participants using the thirteen-item short form of the Marlowe–Crowne Social Desirability Scale, with higher scores indicating more socially desirable responses⁽¹⁹⁾. Parental concern for the child's weight was based on a 5-point Likert scale (1 = 'not at all concerned', 5 = 'very concerned'), and parents were also asked to rate their child's weight on a 5-point scale ('a little underweight', 'underweight', 'normal weight', 'a little overweight', 'overweight').

Baseline intervention appointment

A total of 1093 children underwent screening, of whom 271 were classified as overweight (BMI \geq 85th percentile of US reference data)⁽¹⁴⁾. Parents of these children were randomised to receive information about their child's weight status using motivational interviewing or best practice care, and were subsequently invited into a two-year intervention⁽¹²⁾. Those agreeing to participate (n 203, 75%) attended an additional appointment where the following measures were obtained. Dietary intake was assessed using the Children's Dietary Questionnaire⁽²⁰⁾, a twenty-nine-item questionnaire which yields three subscales of interest. Parents completed the CHAOS (Confusion, Hubbub and Order Scale) questionnaire, with yes or no answers to fifteen items about structure within the

home such as 'there is very little commotion in our home'. Higher scores indicate a greater level of household chaos⁽²¹⁾. Parents also completed the Lifestyle Behaviour Checklist, which asks parents to rate the extent to which they experience twenty-five weight-related behaviours in their child (e.g. eating unhealthy snacks, refusing to do physical activity) on a 7-point scale (from 'not at all' to 'very much')⁽²²⁾.

Physical activity and time asleep were measured over seven consecutive days by ActiGraph (GT3X) accelerometers worn 24 h per day. All sleep time was removed from the files before analysis of physical activity as counts per minute or time in moderate-to-vigorous physical activity⁽²³⁾ was calculated.

Statistics

Measures on demographics, motivation, parenting and beliefs about the child's weight were available in all 271 overweight children (from the health check appointment). Measures of diet, physical activity, sleep, chaos and problem behaviours (Lifestyle Behaviour Checklist) were available for 203 of these children (from the baseline

intervention appointment). A composite motivation for weight change score was calculated from the average of the three questions from the MSM. Cronbach's α for this composite measure was 0.89.

Data are presented as mean and standard deviation, or as number and percentage, as appropriate. Differences between groups were compared using independent *t* tests. Univariate and multivariate regression analysis was used to determine which factors were related to the composite motivation for weight change score. All analyses were undertaken using the statistical software package Stata release 12.

Results

Table 1 presents the demographic characteristics of the study population. The sample was predominantly European, but included a higher proportion of ethnic minority children than is typically observed in the local population (NZ Census, 2006). Although this was a well-educated sample (one-third of mothers with a university degree), a wide range of socio-economic status was still observed.

Table 1 Characteristics of the study population: children (*n* 271) aged 4–8 years, recruited in primary and secondary care, and their parents, Dunedin, New Zealand, March 2010–August 2011

Variable	<i>N</i>	Mean or <i>n</i>	SD or %
Age (years), mean and SD	271	6.4	1.4
Female, <i>n</i> and %	271	150	55
Ethnicity, <i>n</i> and %	270		
New Zealand European and others		200	74
Maori		50	19
Pacific Islander		20	7
Level of household deprivation, <i>n</i> and %	262		
High		71	27
Medium		94	36
Low		97	37
Maternal education, <i>n</i> and %	268		
Secondary only		105	39
Tertiary but not university degree		56	21
University degree		91	34
Other		16	6
Maternal BMI (kg/m ²), mean and SD	258	29.1	6.2
Child BMI Z-score, mean and SD	271	1.61	0.45
Child weight status, <i>n</i> and %	271		
Overweight		166	61
Obese		105	39
Social desirability, mean and SD	139	8.6	2.4
Ineffective parenting practices, mean and SD	270	2.8	0.6
Chaos score, mean and SD	202	3.3	3.1
Lifestyle behaviour checklist score, mean and SD	201	49	16
Restriction of food, mean and SD	271	2.2	0.7
Dietary intake, mean and SD			
Fruit and vegetable score	202	13.8	4.0
Non-core foods score	197	2.5	0.9
Sweetened beverages score	202	0.9	1.2
Accelerometry data, mean and SD			
Counts per minute	197	640	193
MVPA (h/d)	197	0.5	0.3
Sedentary time (h/d)	197	9.2	1.2
Perceived physical activity by child*, mean and SD	271	3.1	0.9

MVPA, moderate-to-vigorous physical activity.

Data are presented as mean and standard deviation, or as number and percentage, as appropriate.

*On a scale where 1 = 'much less active' and 5 = 'much more active' than children of the same age and sex.

Table 2 Parental motivation scores for changing the dietary intake, physical activity participation and body weight of their overweight child (*n* 271), Dunedin, New Zealand, March 2010–August 2011

MSM question*	Mean	SD
It is important that my child eats a healthy diet	9.3	1.2
I could improve my child's diet	7.3	2.3
I am trying to improve my child's diet	6.9	2.7
It is important to me that my child is physically active	9.3	1.0
I could increase the amount of physical activity my child does	7.3	2.0
I am trying to increase the amount of physical activity my child does	6.3	2.5
It is important that I change my child's weight	3.5	3.1
I could change my child's weight	4.8	2.9
I am trying to change my child's weight	3.2	3.3
Composite motivation for changing weight score	3.8	2.8

MSM, Motivational Screening Measure.

*Using a scale from 0 ('definitely not') to 10 ('definitely').

Not surprisingly, maternal BMI was high in this sample of overweight (61 %) and obese (39 %) children.

Table 1 also reports the mean values for the various lifestyle factors of interest in this sample. Overall, parents within the sample reported low levels of chaos within the home (mean score of 3.3 from a total maximum of 15) and a low rate of ineffective parenting practices (mean score of 2.8 from a total maximum of 7). Scores obtained from the social desirability questionnaire spanned the entire range (0–13) with a mean score of 8.6, indicating that social desirability was present within this group. Fruit and vegetable intake was relatively close to the recommended level (14), but children ate more non-core foods than is advised (recommended two or less). However, sweetened drink intake was below the recommended level. Accelerometry data indicated that this was a sedentary group, with children spending more than 9 h/d in sedentary activities and only 33 min/d in moderate-to-vigorous physical activity.

The majority (*n* 158, 58 %) of parents rated their child as normal weight, with ninety (33 %) saying their child was a little overweight and a further twenty-three (8 %) reporting the child as overweight. Only ninety-six parents (36 %) were concerned about their child's weight, with parents being significantly more concerned about girls compared with boys ($P=0.036$), despite no significant sex difference in BMI Z-scores ($P=0.374$). Table 2 presents the findings from the MSM. Parents were clearly more motivated for children to have a healthy diet or be more physically active than to change their body weight, despite all children being overweight or obese. For example, 79–83 % of parents scored 9 or 10 (anchor of 'definitely') for questions assessing the importance of eating healthily or being physically active, compared with only 8 % doing so for changing the child's weight. Similar variation was observed for diet and activity measures of confidence ('I could...') and commitment ('I am trying to...') compared with relevant weight measures (data not shown). Within the weight subscale, confidence in the ability to change children's weight was higher than either importance ($P<0.001$) or commitment ($P<0.001$). Similarly to

weight concern, higher scores were observed for each weight motivation question in girls, indicating that parents seemed to feel it was more important to change their daughter's weight ($P=0.001$) and more were actively trying to do so ($P=0.005$). However, confidence to do so ('I could change their weight') was also higher for girls compared with boys ($P=0.002$). By contrast, sex differences in motivation for improving diet or activity were not apparent (data not shown).

Few demographic variables were related to motivation for changing the child's weight in univariate analyses (Table 3). Although increasing levels of parental motivation were observed in older children and girls, no differences in motivation were apparent by level of household deprivation or maternal BMI. Much stronger positive relationships were observed with the child's actual weight status (BMI Z-score, $P<0.001$) and whether their parents perceived them to be overweight ($P<0.001$) or were concerned about their weight status ($P<0.001$).

Lifestyle was also associated with parental motivation for changing weight (Table 3). Parents reported increased motivation for children who scored higher on the Lifestyle Behaviour Checklist ($P<0.001$), an indicator of problem behaviours common in overweight children. In total, seventy-nine children (39 %) scored 50 or more on this questionnaire, indicating significant clinical issues⁽²²⁾. More motivated parents also scored higher on the food restriction scale, a parental feeding strategy known to be related to body weight during growth. Motivation for weight change was not related to dietary intake (Table 3), but was higher in parents of children with lower levels of physical activity (accelerometer or questionnaire) or more sedentary time (Table 3). Interestingly, motivation to change the child's weight was not related to social desirability, the degree of perceived chaos within the home or overall ineffective parenting practices.

All variables significant in the univariate analysis were entered in the multivariate model with the exception of ethnicity, as the overall P value was not significant. Separate multiple regression analyses were also undertaken using each of the measures of physical activity

Table 3 Predictors of parental motivation to alter child's body weight (using composite score for motivation), Dunedin, New Zealand, March 2010–August 2011

	Univariate models			Multivariate models	
	β	<i>P</i>	<i>R</i> ²	β	<i>P</i>
Age (years)	0.71	<0.001	0.13	0.13	0.277
Sex (female)	1.15	0.001	0.04	0.24	0.125
Ethnicity*	0.13	0.509	0.03		
Maori	0.31	0.597			
Pacific Islander	1.80	0.028			
Level of household deprivation†					
Medium	0.23	0.536			
High	−0.37	0.588			
Maternal education‡	0.08	0.641	0.01		
Tertiary but not university degree	0.02	0.963		0.36	0.271
University degree	−0.12	0.778		−0.12	0.696
Other	1.00	0.027		−0.60	0.211
Maternal BMI (kg/m ²)	0.05	0.087			
Child BMI Z-score	3.10	<0.001	0.25	0.65	0.004
Social desirability (1 unit)	0.08	0.395			
Concern about child's weight§	4.30	<0.001	0.54	2.41	<0.001
Perceived child's weight status	3.65	<0.001	0.41	1.48	0.002
Ineffective parenting practices (1 unit)	0.12	0.464			
Chaos score (1 unit)	−0.01	0.861			
Lifestyle behaviour checklist score (1 unit)	0.06	<0.001	0.10	−0.00	0.716
Restriction of food (1 unit)	2.09	<0.001	0.30	0.79	0.009
Dietary intake					
Fruit and vegetables score (1 unit)	−0.00	0.919			
Non-core foods score (1 unit)	−0.12	0.152			
Sweetened beverages score (1 unit)	0.08	0.560			
Accelerometry					
Counts per minute (100 cpm)	− 0.50	0.002	0.09	−0.08	0.084
MVPA (h/d)	− 2.35	0.001	0.06		
Sedentary time (h/d)	0.67	<0.001	0.08		
Perceived physical activity by child¶	− 0.83	<0.001	0.07		

Values shown in bold were significant ($P < 0.05$).

*Reference group is New Zealand European and Others.

†Reference group is low.

‡Reference group is some secondary.

§Concerned v. not concerned.

||Overweight v. about right.

¶On a scale from 1 ('much less active') to 5 ('much more active').

because of the high multicollinearity between these measures. Only that for counts per minute is shown here but results from the other regression models were comparable. In total, these variables explained a large proportion of the variance in MSM weight score (69%). Age, sex, maternal education and physical activity were no longer significant. Particularly large effects were observed for parental perception of weight status and concern about weight, with relatively smaller contributions from child BMI and food restriction. For example, parents who were concerned about their child's weight scored 2.5 units higher (almost 1 SD) on the MSM than those who were not concerned, with a difference of approximately 1.6 units for parents who classified their child as overweight compared with those who thought they were 'about right'. Comparable differences in motivation for weight score of 0.7–0.8 were noted for 1-unit differences in actual weight status of children (one BMI Z-score) or food restriction (on a possible scale of 1–5). Because motivation for changing the child's weight was so highly correlated with parental concern ($r = 0.76$, $P < 0.001$) and perception ($r = 0.63$,

$P < 0.001$) of weight status, multivariate analyses were also undertaken excluding these two variables from the model. This alternative model still explained 52 % of the variance in motivation, with age ($P = 0.008$), sex ($P < 0.001$), BMI Z-score ($P < 0.001$), food restriction ($P < 0.001$) and physical activity ($P = 0.014$) remaining significant predictors, and lifestyle behaviour score ($P = 0.537$) and maternal education ($P = 0.09$) no longer being significant.

Discussion

Our results demonstrate that parental motivation to change body weight in a community-based sample of young overweight children is low, with only 8 % of parents actively trying to influence their child's weight. As expected, motivation was higher in children with greater degrees of overweight. However, even when restricted just to those with BMI values greater than the 97th percentile, only fourteen of sixty-seven parents (21 %) were actively trying to change their child's weight, despite

virtually all (84 %) of these parents perceiving their child as overweight. While this apparent lack of motivation may seem surprising, others have clearly shown that parents are not concerned about excess weight in young children until it really starts to impede their mental or physical health⁽⁴⁾. The dichotomy between parental ratings of the BMI values that suggest intervention is required, and that of expert committees, has been demonstrated previously^(24,25). Over 70 % of parents reported that the 90th BMI percentile is the minimum point at which weight management should be initiated, of whom one in five indicated that intervention should not happen until above the 97th percentile⁽²⁴⁾. Similarly, a large Australian study could not demonstrate a discernible threshold above which mothers reliably became concerned about their young child's weight⁽²⁵⁾.

Parents indicated greater motivation to change weight in girls compared with boys, despite no sex difference in relative weight status. This is perhaps because mothers are more likely to identify^(26,27) or be concerned^(28,29) about overweight in daughters compared with sons. Presumably, this reflects differing social values reflecting greater acceptance of overweight in boys relative to girls⁽³⁰⁾. Greater motivation scores were also apparent when parents recognised there was a weight issue and/or were concerned about it. This is not surprising given there would be no desire to change weight if parents did not perceive their child as overweight, or at least were not concerned about it. How parents perceive the child's weight, whether they are concerned about it and their motivation to change weight are obviously interrelated variables of interest. While no studies appear to have examined correlates of parental motivation for changing weight in overweight children *per se*, studies have identified several factors predicting increased concern about weight in children including age (older *v.* younger) and sex (girls compared with boys)^(29,31), parental body size⁽⁷⁾, parents with a vested interest (overweight themselves)⁽³²⁾, body fat distribution and intake of sweet drinks⁽³³⁾. Similarly, poorer maternal accuracy regarding children's weight status has been associated with maternal education, maternal BMI, lower physical activity and rapid weight gain in infancy⁽³⁴⁾.

Motivation was also higher in parents who perceived their child to have more problem behaviours as indicated by higher scores on the Lifestyle Behaviour Checklist⁽²²⁾, those who were less physically active and parents who reported a greater degree of food restriction. It is interesting that motivation was higher in children who recorded significantly lower participation in physical activity. In practice, however, these differences are very small, not clinically relevant and were no longer significant in multivariate analyses. Restriction refers to the parent limiting and regulating a child's access to less healthy foods. Although this was initially thought to increase the risk of obesity^(35,36), more recently work has demonstrated that

maternal restriction is associated with lower BMI scores three years later, at least in younger children⁽³⁷⁾. Thus parents who believe their child overeats might use restrictive feeding practices as a way of controlling that eating. Our observation that motivation was associated with restriction fits with other work demonstrating that concern is associated with restriction^(35,38,39). However in our sample, restriction remained a significant correlate of motivation even when adjusted for parental concern about weight.

Interestingly, parents were far more receptive towards changing diet and exercise habits in their children compared with changing weight. Discussions around target behaviours obviously provide an indirect means for health professionals to use as a focus for making important changes that do not address weight directly, but should have positive impact. It may be easier to engage parental motivation and action with diet and activity as a focus rather than weight, which may address concerns health professionals have about managing weight issues without damaging doctor/parent relationships^(40,41). Greater parental intention to change diet or activity (relative to weight) was not a function of social desirability, with no significant correlations between social desirability and any motivation score. This is important given that misreporting of dietary intake and physical activity has been associated with social desirability in children⁽⁴²⁾ and parents⁽⁴³⁾.

The strengths of our study include the use of a community-based sample, rather than a treatment-seeking population, and the assessment of motivation and other variables of interest before feedback of weight status occurred. Our parents were predominantly unaware of the weight status of their young child and the only information provided about the purpose of the study at recruitment was that it was for screening purposes. Although we did not recruit in a truly representative manner, we did purposively recruit a wide section of general practices, resulting in a final study sample with very few demographic differences from the wider local population⁽¹²⁾.

Thus the low levels of parental motivation for changing the weight of their overweight child that we observed do provide cause for concern. Recognition an issue exists is considered the first step in making appropriate behaviour change⁽⁴⁴⁾. Yet recognition alone is obviously not enough given our marked difference in those who rated their child as overweight (41 %) compared with those who were actively trying to change it (8 %). It appears that parents are more amenable and prepared to consider changing diet and activity than weight, which provides a useful pathway for health professionals to take when addressing overweight in young children. This may, at least in part, reflect the success of long-term public health campaigns promoting the importance of a healthy diet and regular physical activity for optimal development. Whether similar campaigns aimed at re-educating the general public about what (un)healthy weight looks like at different developmental

stages would positively affect parental recognition and motivation for addressing overweight in their children is a question for future research. Despite higher levels of motivation for making dietary change, our results demonstrated a real dichotomy between parental views of their level of motivation to change diet and actual dietary behaviour, reflecting the complexity of the relationship between motivation and action. Further research investigating why parents do not appear motivated to change the weight of their overweight child should provide much-needed insight into how best to encourage healthy lifestyles for all young children⁽⁴⁵⁾.

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