



Predictors of health-related behaviour change in parents of overweight children in England[☆]



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ABSTRACT

Objective: Providing parents with information about their child's overweight status (feedback) could prompt them to make lifestyle changes for their children. We assessed whether parents of overweight children intend to or change behaviours following feedback, and examined predictors of these transitions.

Methods: We analysed data from a cohort of parents of children aged 4–5 and 10–11 years participating in the National Child Measurement Programme in five areas of England, 2010–2011. Parents of overweight children (body mass index ≥ 91 st centile) with data at one or six months after feedback were included ($n = 285$). The outcomes of interest were intention to change health-related behaviours and positive behaviour change at follow-up. Associations between respondent characteristics and outcomes were assessed using logistic regression analysis.

Results: After feedback, 72.1% of parents reported an intention to change; 54.7% reported positive behaviour change. Intention was associated with recognition of child overweight status (OR 11.20, 95% CI 4.49, 27.93). Parents of older and non-white children were more likely to report behaviour changes than parents of younger or white children. Intention did not predict behaviour change.

Conclusions: Parental recognition of child overweight predicts behavioural intentions. However, intentions do not necessarily translate into behaviours; interventions that aim to change intentions may have limited benefits.

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Introduction

Parents are important agents of behaviour change in the treatment of childhood obesity (Golan and Crow, 2004). However, outside of treatment settings, the majority fail to recognise that their child is overweight (Parry et al., 2008; Rietmeijer-Mentink et al., 2013). A parent's inability to recognise their child's weight status may be a barrier to effective weight management (Maximova et al., 2008).

Several theories of health behaviour propose that recognition of and intention to change an unhealthy behaviour are important steps towards change (Webb and Sheeran, 2006). The transtheoretical model (TTM) describes behaviour change as progression through a

series of stages: pre-contemplation (no intention to change behaviour), contemplation (intention to change in the near future), preparation (ready to change), action, maintenance, and relapse (Prochaska and Velicer, 1997). These steps have been used to inform health promotion interventions, including childhood weight management (Howard, 2007; Mason et al., 2008). It is believed that increasing parental recognition of child overweight status through the provision of accurate information will prompt progression through stages of behaviour change, leading to healthier behaviours, including improved diet, increased physical activity and reduced sedentary behaviour (Cottrell et al., 2007; Mooney et al., 2010). This is despite the widespread recognition of the 'intention-behaviour gap', which describes the discrepancy between stated intentions and actions (Rhodes and de Bruijn, 2013; Sniehotta et al., 2005). Factors such as knowledge, confidence and environmental barriers may influence progression from intentions to action (Marcus et al., 1992; Wee et al., 2005), and these factors are likely to vary according to individual characteristics including ethnicity and deprivation. For example, families living in

[☆] Data access and responsibility: MHP had full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

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more deprived areas experience greater barriers to healthy lifestyle including reduced access to fruit and vegetables (Cummins et al., 2009) and lack of safe outdoor spaces for physical activity (Molaodi et al., 2012).

In the context of childhood obesity, it is unclear how large the intention–behaviour gap is among parents, and how individual characteristics influence the transition to action (Neumark-Sztainer et al., 2008). Characterisation of parents who are least likely to make steps towards positive lifestyle changes may identify families in greatest need of support. The objectives of this study were to determine the proportion of parents of overweight children at each stage of behaviour change (intention and action) following receipt of information about their child's overweight status, and to identify predictors of these transitions.

Materials and methods

We sampled data from a prospective cohort that comprised the parents of children enrolled in the National Child Measurement Programme (NCMP) in five Primary Care Trusts (PCTs, administrative bodies that had responsibilities for local primary care and public health services) in England, in 2010–2011 (Falconer et al., 2012).

The NCMP is a government initiative which aims to measure the heights and weights of children at state primary schools in England, at school entry (age 4–5) and year 6 (10–11) each year. Weight is measured to the nearest 0.1 kg and height to the nearest millimetre. After the measurement, written feedback is mailed to parents informing them of their child's body mass index (BMI) category; cut-offs at the 2nd, 91st and 98th BMI centiles of the UK 1990 growth curves (Cole et al., 1995) define underweight, healthy weight, overweight and obese (described to parents as 'very overweight'), respectively. Parents of non-healthy weight children are provided with information about the health risks associated with their child's weight status. Feedback also includes information about healthy lifestyles and local health and leisure services.

Parents of the following children were invited to participate in the study: all children enrolled in the NCMP in Redbridge, Islington, and West Essex PCTs, children aged 10–11 in Bath and North East Somerset (BANES) PCT, and children aged 4–5 in Sandwell PCT ($n = 18,000$). Parents completed self-administered questionnaires about perceptions of their child's weight and health, lifestyle and health-related behaviours, and socio-demographic characteristics before the NCMP feedback (baseline, February–July 2011) and at one month and six months after feedback. The questionnaires were developed for the study with input from experts in health-related behaviour and evaluation. The study was approved by the London School of Hygiene and Tropical Medicine ethics committee.

Parents of children identified as overweight or obese by the NCMP who completed questionnaires at baseline and at least one follow-up were included in this study.

Outcomes

Primary outcomes were selected to correspond to the contemplation and action stages of the transtheoretical model: 1) intention to change health-related behaviour at one month after feedback, and 2) positive change in health related-behaviour at one or six months after feedback.

Intention to change health-related behaviour was defined as parental intention to make changes to any of the following at one month: child's diet, physical activity, or use of health or leisure services (doctor, nurse, pharmacist, weight management clinic or leisure services). Intention was assessed based on responses to the questions: *After receiving feedback on your child's result, did you make any changes to your child's diet/how much physical activity your child does?;* and *In the past month, have you accessed any of the following health professionals or leisure services regarding your child's weight?* Those that selected the response, *No, but I intend to*, were considered to have an intention to change the behaviour.

Positive change in health-related behaviour was defined as a positive change in any of: parent-reported diet, physical activity, screen-time behaviour, or health or leisure services use between baseline and one or six month follow-up. An individual with data at both one and six month follow-ups was categorised as having changed their behaviour if an improvement was observed at either time point. Positive change in diet was defined as an increase in healthy

eating score between baseline and follow-up. The healthy eating score was derived from the frequency of consumption of fruits, vegetables, sugary drinks, and snacks (Crocker et al., 2012). For each food category, a score ranging from 1 to 7 was generated according to the frequency of consumption (higher score for increasing consumption of fruit and vegetables, the reverse for other food categories); the healthy eating score was derived as a mean of these scores, with a higher score indicating healthier eating behaviours. Improvement in physical activity was defined as a change from a child not meeting the national physical activity recommendation of 1 h per day at baseline (Department of Health, 2011), to achieving this level at follow-up. Improvement in screen-time behaviours was similarly defined as a change from not meeting screen-time recommendations of up to two hours per day at baseline (American Academy of Paediatrics, 2012), to meeting this level at follow-up. Positive change in the use of health or leisure services was defined as a change from not accessing any of these services for their child's weight at baseline, to accessing one or more of these at follow-up.

Predictors

Predictor variables for intention to change health-related behaviour were: 1) parental recognition of their child's overweight status (parents described their child as *overweight* or *very overweight*; parents of obese children that described their child as *overweight* were considered to recognise their child's overweight status because they acknowledged an issue with excess weight), and 2) parental recognition of the health risks associated with their child's overweight status (parents answered *Yes* to the question, *Do you think your child's current weight puts their health at risk?*), at one month.

The predictor variable for change in health-related behaviour was intention to change behaviour. Other predictors for both outcomes were ethnicity of child (white or non-white, from PCT records), child's sex, child's school year, child overweight status (overweight or obese, from NCMP), deprivation tertiles (using the Index of Multiple Deprivation IMD score, a measure of local area deprivation based on postal code), and PCT (an indicator of area level differences).

Statistical analysis

The characteristics of the cohort were described using frequencies and percentages. The association between each predictor variable and outcome was assessed using logistic regression analysis. In adjusted analyses, models were adjusted for all other predictor variables. Robust standard errors were used to account for clustering by PCT. Results were presented as odds ratios (OR) and 95% confidence intervals (CI). A complete case analysis was carried out for each regression model; this was considered reasonable because analysis of missing observations for predictor variables indicated that missingness was not associated with outcome variables. Potential modification of the main effects by child's overweight category, child's age, or PCT was assessed by the inclusion of interaction terms. All analyses were carried out using Stata version 12 (College Station, TX: StataCorp).

Results

Table 1 shows the study sample characteristics. Of the 3397 parents who responded to the baseline questionnaire (response rate = 18.9%), 579 (17.0% of respondents) had children who were classified as overweight or obese. Of these, 202 parents that responded at baseline and one month follow-up (34.9% of baseline sample) formed the sample for analysis of intention to change; 285 parents that responded at baseline and to at least one of the follow-up questionnaires (49.2% of baseline) formed the sample for analysis of behaviour change; 94% of parents in the sample recalled receiving the feedback letter.

At one month follow-up, 38.2% of parents of overweight children identified their child as overweight, and 28.7% recognised health risks associated with their child's weight.

Most parents (72.1%, $n = 145$) reported an intention to change health-related behaviours at one month; of these, 32 parents (22%) had not reported an intention at baseline. In adjusted analyses (Table 2), intention to change behaviour was positively associated with parental recognition of child overweight status (odds ratio OR 11.20, 95% confidence interval CI 4.49, 27.93). Positive associations

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