

Effect of an obesity pamphlet on parental perception and knowledge of excess weight in their children: results of a randomised controlled trial

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Abstract

Issues addressed: This study examined the effectiveness of a brief educational intervention in increasing parental knowledge of childhood obesity risk factors and ability to correctly identify their child's weight status.

Methods: Eighty parents were randomly allocated to an experimental group given an obesity pamphlet or a control group given a stress management pamphlet. A survey measured parents' knowledge about risk factors, cause and consequences of childhood obesity, and perception of their child's weight.

Results: Parents with overweight or obese children increased their understanding of childhood obesity immediately after receiving the intervention, but did not differ significantly on perception of their child's weight.

Conclusion: The experimental intervention increased knowledge of health risks associated with childhood obesity in parents of overweight or obese children. Parental perception of their child's weight status did not improve, suggesting that other factors have a role to play.

So what? The obesity pamphlet may be a useful tool in a multifaceted approach targeting childhood obesity.

Key words: Childhood obesity, education intervention, parental perception and knowledge of childhood obesity, Health Belief Model.

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Introduction

Childhood obesity is a serious health problem in Australia requiring urgent action.¹ Approximately 25% of Australian children are overweight or obese.² Childhood obesity is associated with physical and mental health issues and increased risk of adult weight problems.^{1,3} The estimated costs of obesity and obesity-related illnesses are in excess of \$37 billion annually in Australia and thus pose a significant burden to health care services.⁴

Strategies aimed at reducing childhood obesity necessarily include parents as they greatly influence children's dietary preferences and physical activity.⁵ According to the health belief model (HBM), parental inaction reflects inadequate risk assessment of health problems and lack of knowledge regarding health behaviour changes.⁶ Etelson *et al.* reported that only 10 percent of parents with obese children accurately perceived their child's weight, compared with 54.9 percent of parents with normal weight children.⁷ Similarly, Crawford *et al.* suggested that parents do not

perceive excess weight as harmful during early childhood and view risks as more serious during adolescence and adulthood.⁸

This study investigated the effectiveness of a brief educational intervention in enhancing parental knowledge of childhood obesity and perception of their child's weight. The intervention consisted of an informational pamphlet and colour-coded Body Mass Index (BMI) charts. A pamphlet was chosen as it has been utilised successfully as part of previous health promotion programs.⁹ The pamphlet was developed to be a cue to action by informing parents of risks, causes and consequences of childhood obesity, and what behavioural changes can be undertaken.

It was hypothesised that parents with overweight and obese children in the intervention would increase their post-test knowledge about risk factors, and report greater understanding of the (a) causes; (b) mental health consequences; and (c) physical consequences of childhood obesity, and have more accurate perception of their child's weight.

Method

Participants and materials

Eighty parents with a child aged between 4–12 years received an obesity or stress pamphlet (See Table 1 for participant characteristics). The obesity pamphlet included: BMI information; causes and consequences of childhood obesity; dietary and physical activity requirements for children; and colour-coded BMI charts.¹⁰ A similar pamphlet about stress management was used as a control condition.¹¹

Parental knowledge about the causes, mental health and physical consequences, risk factors and weight perception was assessed via a 34-item questionnaire adapted from past research and government publications.^{7,12,13} Cronbach's α values ranged from 0.87 to 0.93.¹⁴ Parents rated their child's weight status from *very underweight* to *obese* and knowledge of risk factors from *no knowledge* to *a lot of knowledge*.

Table 1. Demographic information and perceived weight and actual weight category of parents and children in the study (n = 78)

n = 80 for both parents and children. Perceived weight = parents' weight estimation of their child's weight, and their own weight pre-intervention. BMI parents: (self-reported weightkg/heightcms²) 25 \geq overweight, 30 \geq obese. BMI children: calculated using BMI percentiles according to age and gender of the child. Two participants did not provide data about the weight of their child and thus actual weight could not be calculated

	Participants	
	Children	Parents
Mean age in years (s.d.)	8.43 (2.45)	38.95 (7.01)
<i>Gender</i>		
Female	42	72
Male	38	8
<i>Perceived weight category</i>		
Underweight	2 (2.5%)	1 (1.3%)
Normal weight	69 (86.3%)	52 (65.0%)
Overweight	8 (10.0%)	24 (30.0%)
Obese	1 (1.3%)	3 (3.8%)
<i>Actual weight category</i>		
Underweight	6 (7.5%)	2 (2.5%)
Normal weight	54 (67.5%)	41 (51.3%)
Overweight	9 (11.3%)	21 (26.3%)
Obese	9 (11.3%)	14 (17.5%)
<i>Ethnicity</i>		
Caucasian	–	74 (92.5%)
Indigenous	–	1 (1.3%)
Asian	–	2 (3.8%)
Mixed race	–	2 (2.5%)
<i>Education</i>		
Year 12 or less	–	11 (13.8%)
Technical or trade diploma	–	12 (15%)
Tertiary or undergraduate	–	32 (40%)
Post-graduate	–	25 (31.3%)
<i>Annual income</i>		
Under \$100 000	–	45 (56.4%)
Over \$100 000	–	32 (40.1%)

Procedure

The home institution granted ethics approval. Upon entry into the online survey, each parent had a 50% chance of being randomised to the obesity intervention or control condition. Parents in the intervention calculated their child's BMI and reported the weight category (using an online tool) and read the obesity pamphlet. Parents in the control condition read the stress pamphlet. All participants filled out survey questions pre-and-post intervention.

Statistical analysis

Due to the small number of children involved in the study, they were categorised as either normal weight (underweight and normal weight BMI) or overweight (overweight and obese BMI).¹⁰ Intervention (pamphlet type) and weight category were independent variables, with pre-test knowledge scores as covariates, and dependent variables were post-test knowledge on (i) risk factors; and (ii) causes of obesity, mental and physical health consequences. Eta-squared effect sizes are considered small (<0.02), medium (0.13) or large (>0.26). A chi-square examined the relationship between parental perception of child weight (rightly or wrongly perceived) and intervention type.

Results

Parents in the obesity intervention reported significantly greater post-test knowledge than parents in the control condition $F(1,73) = 12.37, P = 0.001, \eta^2 = 0.15$, and parents of normal weight children demonstrated significantly greater knowledge of risk factors than parents of overweight children $F(1,73) = 5.39, P = 0.023, \eta^2 = 0.07$. A trend towards significance was found for the interaction effect between intervention and child weight category $F(1,73) = 3.45, P = 0.067, \eta^2 = 0.05$. For parents with normal weight children, there was no significant difference in knowledge post-test scores according to condition. However, parents with overweight children in the obesity intervention reported significantly greater post-test knowledge $F(1,15) = 12.01, P = 0.003, \eta^2 = 0.45$ than parents in the control condition.

The MANOVA found no overall main effect of intervention ($P = 0.154$), or child weight category ($P = 0.523$). A significant interaction effect was found $V = 0.14, F(3,72) = 3.83, P = 0.013, \eta^2 = 0.14$. Follow-up analyses revealed no significant difference between parents in the obesity and stress condition with normal weight children. However, parents with overweight children reported significantly greater understanding of causes $F(1,16) = 4.46, P = 0.051, \eta^2 = 0.22$, mental health consequences $F(1,16) = 6.8, P = 0.019, \eta^2 = 0.30$, and physical consequences $F(1,16) = 10.66, P = 0.005, \eta^2 = 0.40$ in the obesity intervention than the control condition. Table 2 displays descriptive statistics for post-test knowledge scores.

There was no difference in accuracy of weight perception between the two conditions, $\chi^2(1, n = 78) = 0.86, P = 0.353, \phi = 0.11$.

Table 2. Descriptive statistics for the effect of obesity pamphlet on parental post-test knowledge of risk factors, and understanding of the causes, mental health and physical consequences of childhood overweight and obesity (n = 78)

* = significant difference between subgroups (a) and (b) at $p < 0.05$. n = number of participants. MH = Mental Health. Higher M indicates greater level of knowledge

Condition	Normal weight		Overweight	
	n	M (SE)	n	M (s.d.)
<i>Risk factors</i>				
Obesity	24	4.04 (0.10)	10	3.75 (0.13) ^{a*}
Stress	36	3.84 (0.08)	8	3.06 (0.15) ^{b*}
<i>Causes</i>				
Obesity	24	4.01 (0.10)	10	4.37 (0.14) ^{a*}
Stress	36	4.14 (0.08)	8	3.94 (0.15) ^{b*}
<i>MH consequences</i>				
Obesity	24	4.02 (0.13)	10	4.40 (0.21) ^{a*}
Stress	36	4.20 (0.10)	8	3.59 (0.23) ^{b*}
<i>Physical consequences</i>				
Obesity	24	4.29 (0.12)	10	4.68 (0.17) ^{a*}
Stress	36	4.43 (0.10)	8	3.83 (0.19) ^{b*}

Discussion

The results suggest that the brief educational intervention increased knowledge in parents with overweight and obese children. This finding is important as parents play a critical role in implementing strategies to combat childhood obesity.⁵ Recognition of health risks is a significant motivator behind behavioural changes as identified by the HBM and empirical research.^{15,16}

The intervention had a significant impact on parental understanding about causes and consequences of childhood obesity. This is particularly relevant considering that many parents do not view excess weight during childhood as harmful, and lack awareness of what constitutes a healthy diet and adequate exercise required for children.¹⁵ Parents' perception of their child's weight status did not change, which may limit the extent to which parents' see the relevance of the information to *their* child. Future research could focus on helping parents to correctly identify their child's weight status.

Together, the findings indicate that the intervention had success in modifying knowledge within a predominantly highly educated, female, middle-to-high income earner sample. Research has indicated an inverse relation between childhood obesity and parental education level and income⁷ which may explain the slightly lower rates of obesity in the current study.^{17,18} Future research is needed to generalise the findings beyond this homogenous sample.

The results highlight that an educational pamphlet by itself may be as effective as interventions that include both counselling and printed material.¹⁹ The pamphlet is different from existing educational tools in that it is brief, cost effective, visually pleasing and has easily located actionable dot points. Ideally, it could be

handed out at doctor surgeries, schools and health centres and used as part of a multifaceted approach targeting childhood obesity.

Several limitations are worth noting. Subgroup analyses were conducted on a small sample, however, large effects were found. Only self-reported BMI was taken, which are prone to distortion. Further, examining the effects immediately after the intervention could have influenced post-test scores. Thus, more work is needed to test sustained knowledge and behavioural changes. Research suggests that initial effects may not remain long-term and that participants benefit from reminders.^{19,20}

Conclusion

The educational pamphlet enhanced knowledge of risk factors, causes and consequences of childhood obesity in parents with overweight and obese children. No changes to perception of the child's weight status were found. Future research is required to determine if the results are transferable to other sections of the population, such as different socioeconomic, cultural and educational backgrounds, and to investigate if the significant findings are sustained long-term.

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