Case study 1

Do behavioural interventions focussing on parents as the exclusive agents of change decrease obesity in children ages 4-13 years?

Summary

As childhood obesity becomes an ever more present concern for public health and children's psychological wellbeing, research into which interventions are most effective in preventing this phenomenon are on the rise. This review aims to investigate whether behavioural interventions involving parents as the exclusive agents of change are effective in decreasing obesity in school age children up until the age of 13. These interventions focus on ways of thinking and parenting that result in behavioural patterns, as opposed to interventions focusing solely on physical weight loss only. Five studies met the inclusion criteria which excluded studies that were not randomized control trials, interventions that did not incorporate an interactive behavioural element in their approach and interventions that did not focus solely on parents as being the agents of change. Participants were all school age children and were classed as being overweight or obese in their country of residence. Demographics were mixed with two studies being done in Australia, two in the Netherlands and one in America. Although effect sizes ranged from small to medium for the studies evaluated, there is promising evidence for the effectiveness of parent interventions in preventing obesity in school age children, especially if parents are encouraged and motivated to be actively involved in the intervention themselves.

Introduction

The causes of obesity in children are complex and research has found that the effects of being obese or overweight continue into adulthood (Reilly et al. 2003), with these children being at risk of significant physical and social problems (Lumeng et al. 2010), as well as mental health problems (Halfon, Larson & Slusser 2013). Even more concerning, is the finding that in the UK, rates of obesity are often most prevalent in the more deprived areas showing a possible link between these two factors (Niblett 2014).

Children are still very reliant on their parents for their diet, and it is commonly known that parents serve as role models to their children with regards to behaviours as well as eating habits. There is a plethora of research showing evidence that attitudes toward food and eating habits are passed on from parents to their children, and that certain parenting styles are more common in families where obesity is prevalent (Tibbs et al. 2001, Lissau & Sorensen 1994). The point that perhaps illustrates this most poignantly is the finding that upon reading studies for this review, most of the parents of children in the study were obese or overweight themselves (Jansen, Mulkens & Jansen 2011; West, Sanders, Cleghorn & Davies 2010; Mazzeo et al. 2014).

Research and meta analyses into interventions aimed at reducing obesity in children have shown the need to look further than just targeting diet and promoting healthy lifestyles with parents of obese children, into the realm of parent modelling and parent skills (Kitzman & Beech 2006) (Golan & Weizman 2001).

Family based interventions for childhood obesity are well established in the treatment literature, and clinical trials have demonstrated the importance of involving parents in interventions (West et al 2010).

This paper evaluates five behavioural intervention programs aimed at reducing obesity. Two are interventions based on the triple P parenting program which is a worldwide parenting program focussing exclusively on parenting skills (West et al.2010; Magarey et al. 2011). This intervention draws on cognitive behavioural and social learning theories, as it aims to change parents understanding and perceptions of their children's behaviour in order to change it. Social learning theory also states that children learn in a social context, and that maladaptive behaviours that they exhibit are likely to have been learnt by observing their parents (Bandura 1971).

Three interventions are cognitive behavioural interventions (Moens & Braet 2012; Mazzeo et al. 2014; Jansen et al. 2011).These interventions all focus on reducing obesity through tackling negative or unwanted thoughts that parents have about themselves and their parenting. By changing these and offering more helpful alternatives, this in turn affects their actions and parenting behaviours.

Rationale

In a recent health report conducted by the UK government for the 2013/2014 school year, over a fifth of children in reception (22.5%) were reported to be obese or overweight, and around a third of children in year 6 (33.5%) were measured to be overweight or obese (National child measurement program 2014).

Recent meta analyses of interventions tackling obesity in childhood have found evidence for the use of parent only interventions being effective in the short term for children ages 0 to 6 (Yavuz, van Ijzendoorn , Mesman & van der Veek 2014). These interventions have been shown to be as effective as family based approaches, and more cost effective as they involve less people (Ewald, Kirby, Reece & Robinson 2013).

Furthermore, meta analyses done on obesity interventions involving parents found that the most effective interventions were interventions that focussed on one mode of delivery as opposed to two (Yavuz et al. 2014) (Stice, Shaw & Marti 2006), and also interventions that contained an interactive and behavioural element (Luttikhuis et al. 2009).

Therefore, there is a need to evaluate the effectiveness of programs using parents as the exclusive agents of change in reducing obesity in school age children. Considering recent research, this review also looks to evaluate interventions containing a behavioural element, as these have been shown to be the most effective in reducing obesity in school age children (Luttikhuis et al. 2009).

Due to obesity being on the rise, it is becoming an issue that EP's will encounter more in schools. Tackling obesity in a familial and systemic way is likely to result in more lasting change. These parenting interventions are most accessible when implemented in schools, and therefore EP's have a role to play in implementing them. EP's are also trained in cognitive behavioural interventions and can be important figures in training staff in schools to run interventions in their communities and schools. This review will investigate whether behavioural interventions focussing on parents as the exclusive agents of change decrease obesity in children ages 4-13 years.

CRITICAL REVIEW OF EVIDENCE BASE

Literature search

An initial search carried out on the 16th of January 2015 using the electronic databases Psychinfo, Pubmed, ScienceDirect and Medline. The following search terms were used:

Table 1

Search terms used in literature search

Databases	**Search terms**
Psychinfo, Pubmed, Medline	Parent* (abstract)
	Skill* (abstract)
	Interven* (abstract)
	Obes* (abstract)
ScienceDirect	Parent skill* intervention* obes*

Initial abstract searches of datases with the terms in the table 1 brought up 79 results. Of these, 67 could be rejected from inspection of abstract, and 6 were excluded according to exclusion criteria in table 2. After full inspection of 9 articles, 4 were excluded. Appendix A contains details of excluded studies with rationale.

Figure 1

Database search

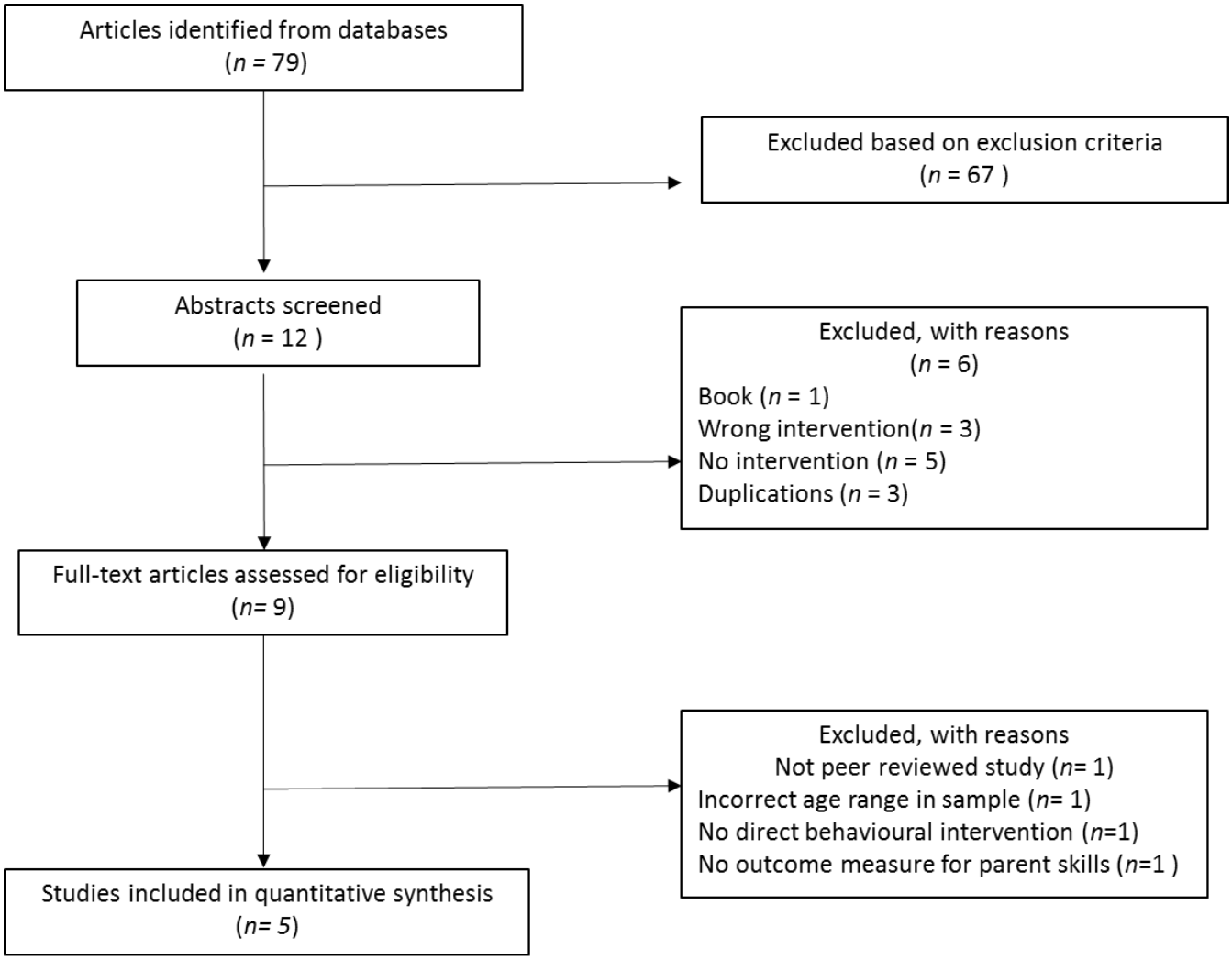

Table 2

Inclusion and exclusion criteria with rationale

	Inclusion criteria	**Exclusion criteria**	**Rationale**
Intervention	Only parents	Intervention includes parent and child or whole family	Interventions focussing exclusively on parents are the area of interest.
	Must have a behavioural element focussing on parent skills/efficacy	Focusses only on physical aspects of weight loss	Behavioural elements are of interest to EP's, and can be incorporated in practice.
	Must have direct, interactive contact with parents.	Interventions that are executed over the phone or online	
Variables	Must have BMI as a primary outcome measure Secondary measure of behavioural change in parent skills or efficacy	Outcome variables focussing only on physical aspects of weight loss.	The interest of this review is the effectiveness of behavioural elements in interventions tackling overweight children.
Participant age	Between the ages of 4 to 13 years old.	Younger than 4, older than 14	Pre pubertal age, and age where parents still have large influence.
Participant other	No other medical complications or disabilities.	Children with other illness or ailments, disabilities	Presence of these ailments may have affected outcome measures

	Parents have a child that is classified as overweight or obese.		
Type of study	An experimental design containing primary and secondary data for intervention group at least.	Qualitative study, does not contain primary empirical data	In order to compare effect sizes of treatments for the intervention group.
Publication type	Published in a peer reviewed journal	Unpublished work or grey literature.	Peer reviewed journals are assessed against a certain criteria.
Language	Published in English	Published in languages other than English.	Required so that information can be read by the reviewer.
Date	Published after January 2009 until current	Published before January 2009	The UK Department of Health launched the Change4Life Initiative to tackle the causes of obesity at this time.

Five studies matched all inclusion criteria and were included in the review. Table 3 below contains the list of studies along with full details of the studies. Appendix E contains a full list of APA references for the five included studies and names of interventions implemented in their study.

Table 3

Included studies with details

Authors	Sample	Design	Measure	Significant/non-significant findings
West, Sanders, Cleghorn & Davies (2010) *Lifestyle Triple P*	101 Australian families with obese or overweight children between 4 and 11 years <u>SES:</u> 75.3% had annual income of 20-100 000 AUSD. Mixed SES.	Waitlist, Pre and post intervention, also 12 month post intervention <u>Design:</u> Randomised clinical trial <u>Weeks:</u> 12 weeks- 9 X 90min group sessions, 3 X 20min telephone sessions	BMI z score Weight related problem behaviour: Lifestyle Behaviour Checklist Parenting self-efficacy: Lifestyle Behaviour Checklist Ineffective parenting:	Decrease in weight for intervention group, compared to no change in control. Parents in intervention group reported lower levels of ineffective parenting strategies, compared to no change in control group.

		Delivery: delivered by a trained Triple P employee in groups with only parents	The Parenting Scale	
Moens & Braet (2012) *Cognitive behavioural intervention*	50 Belgian families with obese or overweight children aged 6 to 12 years. SES Sample consisting of mainly middle income households.	Waitlist control group, Intervention led group Design: Randomised pilot study Weeks: 6 X 2 hour group sessions over space of 5 months. Delivery: Delivered by a psychologist supervised by a	BMI z score for parents and children Measure of child variables Measure of parent variables Health principles questionnaire.	Decrease in weight for control (M1=139.45%, M2=135.92%) and intervention group (M1=147.57%, M2= 142.55%) but only significant for intervention group t(30)=2.44, p=.021. No significant changes in general parenting skills after training.

		behavioural therapist.		
Magarey et al. (2011) *General triple P*	Sample of 169 Australian parents of children ages 5 to 9 years old, all of which were defined as overweight or obese according to the International Obesity Task definition. <u>SES:</u> Middle class families falling in higher range of socio economic	Control group of healthy lifestyle only group, and intervention as parenting skills plus healthy lifestyle group. <u>Design</u>: Single blinded randomized control trial. <u>Weeks:</u> 6 months, 12X parent plus health	BMI z score Parenting sense of competency scale Alabama Parenting questionnaire: involvement w child, positive parenting, monitoring and supervision, consistency in applying discipline and corporal punishment.	Weak effect on BMI z score with addition of parenting skills to the intervention. Not much group difference in parenting+HL and only HL group, attributed this to the parenting intervention being generic Triple P program not designed for target population.

	index for Australia.	groups, 8X health only groups Delivery: Triple P accredited trainers.		
Mazzeo et al. (2014) *NOURISH*	84 families from culturally diverse backgrounds 6-11 years old, with 60.7% identified as being African American. SES 41.7% reporting annual income of less than USD35 000, classed as low income.	Waitlist control group or NOURISH intervention group. Design: Randomized control trials Weeks: 6 or 12 session groups, with 6 month follow up Delivery:	BMI z score Parent measures: 3 factor eating questionnaire Child feeding questionnaire Anthropic measures Block food screener Child measures:	Significant BMI decrease in intervention group (98.47% to 98.29%), versus virtually no change in control group (97.86% to 97.86%). Between group changes significant as X^2=7.14, p<.004 Increase in parental concern about child weight in control group, but no significant change in any other variables reported. These results were not reported in journal article.

		Doctoral students supervised by clinical psychologist	Anthropic measures	
Jansen et al. (2011) *'Finger in the Pie' cognitive behavioural intervention*	Parents of 98 Dutch overweight or obese children aged 7-13 years. <u>SES</u> Not reported	Intervention group getting cognitive behavioural intervention, waitlist control group. <u>Design:</u> Randomised control design <u>Weeks:</u> 8X 2 hour sessions spread over 10 weeks. <u>Delivery:</u>	BMI Child eating disorder examination questionnaire, completed by children Eating behaviours Physical activity Self esteem: self-perception profile for children	Significant decrease in BMI for intervention group Post hoc paired sample t test showing significant decrease in negative thoughts, $t(1,72)= 2.86$, $p<0.01$ but this was reported for all children. Main effect of time found on self esteem for all children, showing significant increase from pre to post treatment $t(1, 64)= 3.27$, $p<0.01$.

	Trained cognitive behavioural therapists.	Negative thoughts: Heavy thoughts questionnaire completed by child

Weight of Evidence (WoE)

The Gough (2007) framework and the Kratchowill (2003) protocol were used to assess the applicability of each study to the chosen research question.

WoE A identifies methodological quality and makes a general judgement about the coherence and integrity of the evidence. WoE B identifies methodological relevance and considers the appropriateness of the individual studies research design for answering the review question. WoE C identifies the relevance of evidence to the review question. In order to administer an overall assessment of the extent to which a study contributes evidence to answer the review question, weightings are given to the scores of WoE A, B and C and averaged to correspond to an overall weight of evidence labelled WoE D. Table 4 summarises the final weighting summary given to each study included in this review (with detailed evaluation of weighting criteria, procedures and results in Appendix B and C). The outcomes analysed are BMI measures for children, and measures for parent efficacy or skills are seen as an indication of implementation fidelity.

Table 4

WoE judgements (based on Gough 2007)

Reviewed study	***WoE A***	***WoE B***	***WoE C***	***WoE D***
West et al. 2010	Medium- 2.25	High- 3	Medium-2	Medium 7.25/ 3= 2.4
Moens & Braet 2012	Medium- 2	Low-1	High-3	Medium 6/3= 2
Jansen et al. 2011	High -2.5	High-3	High-3	High 8.5/3=2.8

Magarey et al. 2011	High- 2.5	Low- 1	Medium-2	Medium 5.6/3=1.8
Mazzeo et al. 2014	Low- 1	Medium-2	High-3	Medium 6/3= 2

Participant characteristics

Participants in all studies ranged in from 4 to 13 years of age. All children were defined as being overweight or obese with respect to their BMI. In the West el al (2010) study, parents were allowed to participate if they defined their child as being overweight. This sample consisted of 27% of children in the overweight range, and 74.3% being in the obese range. Magarey et al.'s sample were defined as obese or overweight according to the International Obesity Task Force. All participants in Moens & Braet's (2012) study were between 20-85% overweight as stated by their BMI. Mazzeo et al. (2014) included participants if their BMI was above the 85th percentile, meaning they were all obese. Jansen et al.'s (2011) sample's mean BMI was in the 96th percentile as calculated by the Children's BMI for age calculator. All participants had no other health concerns, and were on no other medication or intervention whilst taking part in studies.

Four studies consisted of primarily white samples, perhaps reflecting the demographics of where these studies were carried out, being Australia (West et al. 2010) (Magarey et al. 2011), Belgium (Moens & Braet 2012) and the Netherlands (Jansen et al. 2011). One study had a sample consisting of 84% African American participants (Mazzeo et al. 2014), with this study looking to develop interventions that were culturally sensitive and applicable to a range of ethnicities.

Parent socio economic status (SES) has been shown to be a predictor of children being overweight or obese, however the samples of the studies reviewed here seem to have a mixture of income groups and no links between these factors were reported by studies.

Research design

All studies reviewed were randomized control trials, with participants being allocated randomly to either intervention or control groups. West et al. (2010) and Margarey et al. (2011) allocated participants to groups via a computer generated random number system, Moens & Braet (2012) allocated randomly by an administrative co-worker according to the date which they contacted the research group. Mazzeo et al. (2014) used a random number generator to assign groups and Jansen et al. (2011) did not state how groups were randomized.

Sample sizes

Studies sample sizes ranged from 50 (Moens & Braet 2012) to 169 participants (Margarey et al. 2011). A previous meta analysis looking at interventions aimed at reducing obesity in early childhood reported that the combined effect size of interventions aimed at parents were small (d=.08) but significant at short term follow up (Yavuz et al. 2014). According to criteria identified in the Kratchowill protocol (2003), the required group size to pick up small effect sizes is 393 (for a 2 group ANOVA or T test at .05 significance level). None of the studies in this review met this criteria, and their small sample sizes reduced the WoE for these studies. The only study that was sufficiently powered to pick up even a medium effect size was Margarey et al. (2011), as their sample consisted of 169 participants.

Control groups

All studies used control groups in the form of waitlists, other than the Margarey et al. (2011) study which had a group program on healthy lifestyles as its control. Studies employing an intervention that combined a behavioural intervention with a health based program were weighted lower in WoE, compared to those implementing interventions that were purely behavioural.

Group equivalence

Group equivalence between intervention and control groups was identified in all studies in relation to demographics such as age, gender, weight status and socio economic position. Two studies also controlled for parental BMI (Jansen et al. 2011, Moens & Braet 20120).

Measures

All studies identified BMI percentile or Z score as their primary outcome measure. It is well referenced in the literature that robust comparisons of obesity across countries are difficult due to different methods and norms being used to classify what ‘obese’ or ‘overweight’ children are (National obesity observatory 2009).

West et al. (2010) used international standard definitions to calculate BMI z scores, Margarey et al. (2011) used UK referenced norms, whilst Jansen et al. (2011) and Mazzeo et al. (2014) used American referenced norms. Moens & Braet (2012) calculated their adjusted BMI according the European body mass group.

Pre and post intervention BMI were measured by using standard procedures. All studies measured participants immediately post study, except for Moens & Braet (2012) who relied on parent report for post intervention measurements. Whether

these measurements were true reflections of measurements cannot be known and this study therefore received a lower WoE as a result. Margarey et al. (2011) took extra caution and stated that a blind assessor took post measurements ensuring the validity of measurements.

Due to the design of interventions, parent skills is identified as being an indicator of implementation fidelity rather than an outcome measure as identified in the studies, due to change in participants BMI not being wholly attributable to parent skills.

Secondary measurements that were focussed on parenting skills or aspects of parenting self-efficacy were completed by parents in all studies except one, where the questionnaire was filled in by the child. The effect sizes of the different parental interventions as measured by these questionnaires can be seen in table 5..

Table 5

Effect sizes of parenting efficacy/skills

Study	Outcome variable	Informant	Effect Size (Beckers)	Effect size descriptor
West et al. 2010	Lifestyle behaviour checklist	Parent	0.83	large
Margarey et al. 2011	Alabama parenting questionnaire	Parent	0.04	small
Moens & Braet 2012	The Ghent Parenting Behaviour scale	Parent	-0.08	small
Mazzeo et al. 2014	Child Feeding Questionnaire (Parental concern about child	Parent	0.33	small

	weight subscale reported)			
Jansen et al. 2011	Heavy thoughts questionnaire (Negative thoughts)	Child	0.15	small

Two studies (Margarey et al. 2011, Moens & Braet 2012) included in the review did not report outcome measures for the control group with regards to parent efficacy or skills. It is for this reason that a Becker's effect size was calculated for all studies in order to compare effect sizes of parent skills across all studies. This calculation shows the mean changes for the intervention groups, and is calculated by subtracting pre from post scores and then dividing by the standard deviation of the pre score (Becker 1988). Effect sizes were evaluated in the same way as Cohen's interpretation with small being .2, medium .5 and large .8 (Cohens 1992). It must be noted that due to no control group comparison, Becker's effect sizes are likely to be slightly larger than if Cohen's effect sizes were calculated. This was taken into consideration when interpreting the parent skills effect sizes results. One study (Moens & Braet 2012) was calculated as having a negative effect size, meaning that parent skills were measured as being worse after the intervention took place.

All measures were standardised and well referenced measures of parenting skills that were used in previous studies and reported in previous literature, other than the measure used by Jansen et al. (2011). Their measure of negative thinking concerning weight and body issues was a self-composed measure completed by the overweight child, with a reported Cronbach's alpha of 0.88.

Whilst all measures used were standardised, it is important to note that the Lifestyle behaviour checklist used by West et al. (2010) was the only measure specifically designed and standardised on an overweight and obese parent population, in order to distinguish between parenting styles of parents with obese versus healthy children. This could account for the large effect size as measured by this checklist, compared to the small effect sizes calculated for all the other measures.

Application of intervention

Delivery and time

All interventions reviewed took place in groups and incorporated only parents, ranging from being implemented over the space of 10 weeks to 6 months. Two interventions were delivered by fully trained cognitive behavioural psychologists (Jansen et al. 2011, Moens & Braet 2012), two were delivered by accredited triple P practitioners (West et al. 2014, Margarey et al. 2011) and one was delivered by doctoral psychology students being supervised by a trained clinical psychologist (Mazzeo et al. 2014).

Components of treatment

Three interventions focussed on cognitive behavioural approaches to improving parenting skills (Mazzeo et al. 2014, Jansen et al. 2011, Moens & Braet 2012).These placed an emphasis on parental modelling as being key to child development. Self-monitoring, contingency management and stimulus control were common themes across interventions as well as a focus on positive parental involvement and parental feeding skills. The triple P program implemented by Margarey et al. (2011) is a generic parenting program implemented across Australia, and across the world. This

program was implemented with healthy lifestyle sessions focussing on food servings, healthy eating, monitoring lifestyle behaviours and increased activity.

West et al. (2010) implemented a more specific version of the triple P program, called Lifestyle triple P. This program was designed to teach parenting skills to parents with overweight children with a focus on using positive parenting to promote healthy eating, nutrition and physical activity in their families.

Implementation fidelity

All studies scored a high WoE for their implementation fidelity, with interventions being manualized and recorded, with ongoing training and supervision of program implementers stated.

Changes in parenting skills were seen as an indicator of implementation fidelity, as the change in child BMI was attributed to a change in parenting skills by researchers. The effect of interventions on measures of different parenting skills can be seen in table 5 above.

Findings: outcomes and effect sizes

Due to the fact that studies reported primary outcome measures in different ways, effect sizes were computed using pre and post outcome measures and standard deviations in order to compute obtain a Cohen's *d* effect size.

The effect sizes were evaluated by comparing them to Cohen's (1992) interpretation of small (.2), medium (.5) and large (.8) effect sizes.

Table 6

Effect sizes of BMI outcome measure

Study	Outcome variable	Effect size (Cohen's d)	Effect size descriptor	WoE D
West et al. 2010	BMI z score	0.22	small	Medium- 2.4
Margarey et al. 2011	BMI z score	0.11	small	Medium- 1.8
Moens & Braet 2012	BMI %ile	0.03	small	Medium- 2
Mazzeo et al. 2014	BMI %ile	0.10	small	Medium- 1.8
Jansen et al. 2011	BMI %ile	0.77	medium	High- 2.8

All effect sizes reported by the studies reviewed were small, except for one which was described as medium. The presence of a medium effect size is surprising in this study (Jansen et al. 2011) given that power analysis showed a lack of power to pick up a medium effect.

Jansen et al. (2011) and Mazzeo et al. (2014) were the only studies to also measure and report parent BMI at pre testing. Furthermore, Jansen et al. (2011) is the only study that also measured parent BMI at post intervention, this information was not reported in the Mazzeo et al. (2014) study. It is possible that this intervention had a bigger effect due to implementers also checking and reporting parent BMI in this study, leading parents to be more stringent in implicating the intervention at home. Jansen et al. (2011) reported a decrease in parent BMI post intervention, meaning that even though the intervention was targeted at decreasing child BMI, it also had a positive effect on parents. This finding that the whole family can benefit from an

intervention focussed only on parents is promising. It must be remembered that the WoE given to this study was ‘medium’, and that absence of an active control group could have resulted in large effect sizes as the control group was a waitlist.

All studies, except for Margarey et al. (2011) were underpowered, meaning that their sample sizes were inadequate. Underpowered studies are likely to produce non-significant results, even when effect sizes may be large. Inadequate sample sizes undermine effect size results and compromise generalizability.. When compared to findings of previous meta analyses reviewing parent interventions for obesity in younger children (Yavez et al. 2014) or eating related behaviours (Stice & Shaw 2004), the effect sizes of the studies reviewed here are larger than reported before (d=.08).

Outcome and fidelity measures

When BMI scores and parenting skills scores are compared across studies, a varied picture presents. The study that reported the biggest effect size in BMI score (Jansen et al. 2011), had no significant effects on parenting skills as measured by the Heavy thoughts questionnaire. A main effect of time was reported for both negative thoughts and self-esteem in children in this study (Jansen et al. 2011). However, a measure that perhaps tapped more into parenting skills, and less into the child’s self-concept may have proved more insightful for this review question, which is why this study received a low rating for WoE A (see table 4).

West et al. (2010) reported a large effect size for parenting skills, and a small effect size for child BMI. As mentioned before, this study was underpowered and this could perhaps account for the small effect with BMI change. This was the only study that used a tailored measure to pick up changes in parenting skills for parents of obese

children, all other studies used general parenting skills measures. This could account for the large effect picked up by this measure.

Low effect sizes in parenting measures of all other studies could be due to a variety of other reasons. Margarey et al. (2011) reported that their intervention was designed to target parent skills generally, and was not tailored to this particular population. Mazzeo et al. (2014) had a large dropout rate, and therefore the outcome measures may not have reflected the actual change that their intervention could have bought about.

Conclusion

This review aimed to evaluate the effectiveness of behavioural interventions implementing parents as the exclusive agents of change in order to decrease obesity in their children. Effect sizes and outcomes provide evidence for parent only interventions being effective, however some issues are identified. Implications and conclusions for further practice when implementing these kinds of interventions are presented and discussed.

Results from this review supports evidence for parent only interventions being effective, furthermore, it could also be argued that evidence was also found to support previous analyses that state that using one mode of intervention is more powerful than multiple modes, as the only intervention employing a dual mode intervention focussed on healthy lifestyle plus parenting skills had one of the smallest effect sizes in relation to BMI and parent skills (Margarey et al. 2011). These findings have implications for the cost effectiveness of future interventions, as focussing interventions on parents only and on one mode of intervention are more cost effective than others that incorporate dual model and whole family approaches.

Attributing change in child BMI to an increase in parent skills as measured in the studies reviewed here was not wholly supported. Studies that led to a large decrease in child BMI did not show a significant increase in parenting skills outcomes. This could be due to measures employed by studies not actually measuring the parenting skills that the intervention was targeting, therefore showing no effect. For example, Jansen et al. (2011) measured parent skills by questionnaire's looking at negative thoughts and self-esteem as reported by children. Similarly, Mazzeo et al. (2014) measured parent skills as being an increase in parental concern about child's weight. There is a need for future studies to employ measures that are designed for this particular population in order to reflect the effect that interventions have on parenting skills. This is already being made possible by researchers such as West et al. (2014) and their development of the Lifestyle behaviour Checklist for parents of overweight children (West & Sanders 2009). Similarly, interventions that were designed specifically for a clinically obese population seemed to yield higher effect sizes for parent skills (West et al. 2010).

An interesting finding was that the only study in the review that yielded a medium effect size on child BMI was one that focussed not only on measuring child anthropometric measures at post intervention, but also on parent anthropometric measures (Jansen et al. 2011). Both parents and children showed significant decreases in BMI in this study, and further research is needed to explore the potential benefits of actively including parents in interventions, especially considering the large percentage of children who had parents who were also overweight or obese in all studies reviewed.

Finally, all studies reviewed here except for one (Margarey et al. 2011) had sufficient power to pick up a medium effect size. All other studies were underpowered as

judged by the Kratochwill (2003) protocol, and their results would therefore need to be interpreted with caution.

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Reilly, J.J., Methven, E., McDowell, Z.C., Hacking, B., Alexander, D., Stewart, L., & Kelnar, C.J.H. (2003). Archives of Disease in Childhood, 88, 748–752.

Stice, E., Shaw, H., & Marti, C.N. (2006). A meta analytic review of obesity prevention programs for children and adolescents: The skinny on interventions that work. *Psychological Bulletin*, 132, 667-691.

West, F., & Sanders, M.R. (2009). The lifestyle behaviour checklist: a measure of weight related problem behaviour in obese children. *International journal for paediatric obesity 4(4): 266-273.*.

West, F., Sanders, M. R., Cleghorn, G. J., Davies, P. S. W., Odoki, K., & Cook, D.G. (2010). Randomised clinical trial of a family-based lifestyle intervention for childhood obesity involving parents as the exclusive agents of change. *Behaviour Research and Therapy*, 48, 1170–1179.

Whitaker, R.C., Wright J. A., Pepe M.S., Seidel K.D., Dietz W.H. (1997). Predicting obesity in young adulthood from childhood and parental obesity. N Engl J Med 1997; 337: 869–873.

Tibbs, T., Haire-Joshu, D., Schechtman, K. B., Brownson, R. C., Nanney, M. S., Houston, C. (2001). The relationship between parental modelling, eating patterns,

and dietary intake among African-American parents. *Journal of the Dietetic Association*, 101, 535–541.

Yavuz, H.M., van Ijzendoorn, M.H., Mesman, J. & van der Veek, S. (2014). Interventions aimed at reducing obesity in early childhood: a meta-analysis of programs that involve parents. *Journal of child psychology and psychiatry*.

Appendix A

List of excluded studies

Study	Reason for exclusion
Ball, G. (2012) Parents as Agents of Change (PAC) in pediatric weight management: The protocol for the PAC randomized clinical trial.	Not peer reviewed journal, and all data not reported due to it being a protocol.
Smith, J.D., Montano,Z., Dishion, T.J., Daniel, S. & Wilson, M.N. (2014). Preventing weight gain and obesity: Indirect effects of the family check-up in early childhood. Prevention science journal.	No behavioural aspect of intervention, also indirect effects.
Boutelle, K.N., Cafri, G. & Crow, S.J (2011). Parent only treatment for childhood obesity: a randomized control trial. Obesity, 19. Pp574-580.	No behavioural outcome measures, only BMI.
Ostbye, T., Zucker, L.N., Krause, K.M., Lovelady, C.A., Evenson, K.R., Peterson, B.L., Bastian, L.A.,Swammy, G.K, West, D.G. & Brouwer, R.J.N. (2011). Kids and Adults Now! Defeat Obesity (KAN-DO): Rationale, design and baseline characteristics. Contemporary clinical trials 32 (3) 461-469.	Wrong age group.

Appendix B

WoE A-Quality of methodology

Based on Kratchowill (2003) protocol

Authors	Measurement	Comparison group	Implementation Fidelity	Follow up Assessment	Average score	Weight of Evidence A
West et al. (2010)	2	2	3	2	9/4=2.25	Medium
Moens & Braet (2012)	2	2	3	1	8/4=2	Medium
Jansen et al. (2011)	2	2	3	3	10/4=2.5	High
Margarey et al. (2011)	1	3	3	3	10/4=2.5	High
Mazzeo et al. (2014)	0	2	2	0	4/4=1	Low

WoE B- Appropriateness of research design for answering whether parenting intervention was successful in decreasing obesity in children.

Rationale: randomized control trials are considered to be the golden standard of research as participants are randomly assigned (Akobeng 2005). Outcome measures need to focus specifically on parent skills and additionally on BMI as the best measurement of reduction in obesity over time.

High- Study must have randomly assigned participants to either an intervention or a control group. Outcome measures must include variables looking at parent skills and child BMI for both groups. They must have established group equivalences.

Medium- Study must have a comparison group and must have established group equivalence. Outcome measures look at child BMI and an aspect of parent skills for both groups.

Low- Study doesn't have a comparison group, only reports behavioural outcomes for intervention group.

WoE C- Relevance to the review question

Rationale: The intervention must include direct contact with parents as this is similar to a therapeutic interaction. If the intervention is adapted for parents of obese children it is considered more relevant to this study. High levels of program fidelity ensures that the intervention is targeting behaviours explicitly stated.

High- Intervention includes direct contact with parents, and intervention is only behavioural.

Behavioural intervention is adapted specifically for parents of obese children.

Staff delivering intervention were given formal training.

Study reported high levels of fidelity.

Medium- Intervention involves some direct contact with parents and has a behavioural aspect including a focus on physical health.

Behavioural intervention is suited to general population.

Staff delivering intervention offered some training.

Reports on levels of fidelity.

Low- Limited direct contact with parents and minimal behavioural aspect.

No adaptations made to population.

No report of intervention fidelity.

WoE D- Overall weight of evidence

Studies were given scores of high, medium or low for their weightings in WoE A, B and C. In order to work out WoE D these scores were averaged, leading to scores being waited as follows:

High overall WoE- average score of at least 2.5

Medium overall WoE- average score between 1.5 and 2.4

Low overall WoE- average score of less than 1.5

Appendix C

Application of WoE criteria to the 5 selected studies

Reviewed study	***WoE A***	***WoE B***	***WoE C***	***WoE D***
West et al. (2010)	Medium- 2.25	High- 3	Medium-2 Not direct contact throughout, but intervention adapted to overweight population	Medium 7.25 / 3= 2.4
Moens & Braet (2012)	Medium- 2 No control group measures reported for parent skills	Low-1 Outcome measures only reported for intervention group with parent skills	High-3 Delivered by behavioural therapist, manualized and direct contact throughout	Medium 6/3= 2
Jansen et al.. (2011)	High-2.5 Used multiple methods but not multiple sources, used waitlist control group	High-3	High-3 Delivered by a behavioural therapist, manualized and behavioural focus	High 8.5/3=2.8

Margarey et al. (2011)	High- 2.5 Used multiple methods not multiple sources. Active control group	Low- 1 Behavioural outcome measures for comparison group not reported, only BMI	Medium-2 Intervention has behavioural aspect including focus on physical health.	Medium 5.5/3= 1.8
Mazzeo et al. 2014	Low- 1 High attrition rates leading to questionable power analyses.	Medium-2 Outcome measures looking at aspects of parent skills	High-3 Intervention is behavioural, involves direct contact and reports high fidelity	Medium 6/3=2

Appendix D

List of included studies

Study	Intervention name/type
West, F., Sanders, M. R., Cleghorn, G. J., Davies, P. S. W., Odoki, K., & Cook, D.G. (2010). Randomised clinical trial of a family-based lifestyle intervention for childhood obesity involving parents as the exclusive agents of change. Behaviour Research and Therapy, 48, 1170–1179	Lifestyle triple P
Margarey, A.M., Perry, R.A., Baur, L.A., Steinbeck, M.S., Hills, A.P., Wilson, G., Lee, A., Daniels, L.A. (2011). A parent led family focused treatment program for overweight children aged 5 to 9 years: the PEACH RCT. Pediatrics 2011; 127;214.	Group triple P

Moens, E., & Braet, C. (2012). Training parents of overweight children in parenting skills: a 12 month evaluation. Behavioural and Cognitive Psychotherapy, 40, 1-18.	Cognitive behavioural intervention focussing on general parenting skills
Jansen, E., Mulkens, S., & Jansen, A. (2011). Tackling childhood overweight: Treating parents exclusively is effective. International Journal of Obesity, 35(4), 501–509.	Finger in the pie cognitive behavioural intervention
Mazzeo, S. E., Kelly, N. R., Stern, M., Gow, R. W., Cotter, E.W., Thornton, L.M., Evans, R. K. & Bulik, C.M. (2012). Parent skills training to enhance weight loss in overweight children: Evaluation of NOURISH. Eating behaviours 15, 225-229.	NOURISH- an intervention based on Social Cognitive Theory which emphasizes parental role modelling as a primary way children learn health behaviours. Emphasis is placed on enhancing parents' self-efficacy to make positive changes in eating and exercise behaviors.

	In addition, cognitive-behavioral strategies such as self-monitoring, contingency management, and stimulus control are incorporated into NOURISH.

Coding Protocol: Group-Based Design

Domain:

- ☐ School- and community-based intervention programs for social and behavioral problems
- ☐ Academic intervention programs
- ✓ Family and parent intervention programs
- ☐ School-wide and classroom-based programs
- ☐ Comprehensive and coordinated school health services

Name of Coder(s): ucjtst8 **Date**: 6/2/2015

Full Study Reference in APA format: Mazzeo, S., Kelly, N.R., Stern, M., Gow, R.W., Cotter. E.W. et al (2014) Parent skills training to enhance weight loss in overweight children: Evaluation of NOURISH. Eating behaviours 15, 225-229.

Intervention Name (description from study): Nourishing Our Understanding of Role modelling to Improve Support and Health.

Study ID Number (Unique Identifier): 2

Type of Publication: (Check one)

- ☐ Book/Monograph
- ✓ Journal article
- ☐ Book chapter
- ☐ Other (specify):

I. General Characteristics

A. General Design Characteristics

A1. Random assignment designs (if random assignment design, select one of the following)

A1.1 [X] Completely randomized design
A1.2 [ ] Randomized block design (between-subjects variation)
A1.3 [ ] Randomized block design (within-subjects variation)
A1.4 [ ] Randomized hierarchical design

A2. Nonrandomized designs (if nonrandom assignment design, select one of the following)

A2.1 [ ] Nonrandomized design
A2.2 [ ] Nonrandomized block design (between-participants variation)
A2.3 [ ] Nonrandomized block design (within-participants variation)
A2.4 [ ] Nonrandomized hierarchical design
A2.5 [ ] Optional coding of Quasi-experimental designs (see Appendix C)

A3. Overall confidence of judgment on how participants were assigned (select one of the following)

A3.1 [ ] Very low (little basis)
A3.2 [ ] Low (guess)
A3.3 [ ] Moderate (weak inference)
A3.4 [ ] High (strong inference)
A3.5 [X] Very high (explicitlystated)
A3.6 [ ] N/A
A3.7 [ ] Unknown/unable to code

B. Statistical Treatment/Data Analysis (answer B1 through B6)

B1. Appropriate unit of analysis	yes	no	
B2. Familywise error rate controlled	yes	no	N/A
B3. Sufficiently large *N*	yes	no	

Statistical Test: T tests
_level: .05
ES: Medium
N required:
64 per group

B4. Total size of sample (start of the study): 91 N

B5. Intervention group sample size: 44 N

B6. Control group sample size: 47 N

For studies using qualitative research methods, code B7 and B8

B7. Coding

B7.1 - Coding scheme linked to study's theoretical-empirical basis (select one) [ ] yes [ ] no

B7.2 - Procedures for ensuring consistency of coding are used (select one) [ ] yes [ ] no
Describe procedures: _____

B7.3 Progression from abstract concepts to empirical exemplars is clearly articulated (select one) ☐ yes ☐ no

B8. Interactive process followed (select one) ☐ yes ☐ no

Describe process: _____

C. Type of Program (select one)

C1. ☐ Universal prevention program
C2. ☐ Selective prevention program
C3. ☐ Targeted prevention program
C4. ☒ Intervention/Treatment
C5. ☐ Unknown

D. Stage of the Program (select one)

D1. ☐ Model/demonstration programs
D2. ☒ Early stage programs
D3. ☐ Established/institutionalized programs
D4. ☐ Unknown

E. Concurrent or Historical Intervention Exposure (select one)

E1. ☒ Current exposure
E2. ☐ Prior exposure
E3. ☐ Unknown

II. Key Features for Coding Studies and Rating Level of Evidence/ Support

(3=Strong Evidence 2=Promising Evidence 1=Weak Evidence 0=No Evidence)

A. Measurement (answer A1 through A4)

A1. Use of outcome measures that produce reliable scores for the majority of primary outcomes. The table for Primary/Secondary Outcomes Statistically Significant allows for listing separate outcomes and will facilitate decision making regarding measurement (select one of the following)

A1.1 ☐ Yes
A1.2 ☒ No
A1.3 ☐ Unknown/unable to code

A2. Multi-method (select one of the following)

A2.1 ☐ Yes
A2.2 ☒ No
A2.3 ☐ N/A
A2.4 ☐ Unknown/unable to code

A3. Multi-source (select one of the following)

A3.1 ☐ Yes
A3.2 ☒ No
A3.3 ☐ N/A
A3.4 ☐ Unknown/unable to code

A4. Validity of measures reported (select one of the following)

A5.1 ☐ Yes validated with specific target group
A5.2 ☐ In part, validated for general population only
A5.3 ☒ No
A5.4 ☐ Unknown/unable to code

Rating for Measurement (select 0, 1, 2, or 3)**:** ☐ **3** ☐ **2** ☐ **1** ☒ **0**

B. Comparison Group

B1. Type of Comparison Group (select one of the following)

B1.1 ☐ Typical contact
B1.2 ☐ Typical contact (other) specify:
B1.3 ☐ Attention placebo
B1.4 ☐ Intervention elements placebo
B1.5 ☒ Alternative intervention
B1.6 ☐ PharmacotherapyB1.1
B1.7 ☐ No intervention
B1.8 ☐ Wait list/delayed intervention
B1.9 ☐ Minimal contact
B1.10 ☐ Unable to identify comparison group

Rating for Comparison Group (select 0, 1, 2, or 3)**:** ☐ **3** ☒ **2** ☐ **1** ☐ **0**

B2. Overall confidence rating in judgment of type of comparison group (select one of the following)

B2.1 ☐ Very low (little basis) B2.2 Low (guess)
B2.3 ☒ Moderate (weak inference)
B2.4 ☐ High (strong inference)
B2.5 ☐ Very high (explicitly stated)
B2.6 ☐ Unknown/Unable to code
☐

B3. Counterbalancing of Change Agents (answer B3.1 to B3.3)

B3.1 ☐ By change agent
B3.2 ☒ Statistical
B3.3. ☐ Other

B4. Group Equivalence Established (select one of the following)

B4.1 ☒ Random assignment
B4.2 ☐ Posthoc matched set
B4.3 ☐ Statistical matching
B4.4 ☐ Post hoc test for group equivalence

B5. Equivalent Mortality (answer B5.1 through B5.3)
B5.1 ☐ Low Attrition (less than 20% for Post)
B5.2 ☐ Low Attrition (less than 30% for follow-up)
B5.3 ☐ Intent to intervene analysis carried out

Findings high attrition rates, effecting post intervention measures.

Null Findings/Negative Outcomes Associated with the Intervention (listed alphabetically by outcome)

Outcomes	Primary vs. Secondary	Who Was Targeted for Change		What Was Targeted for Change	Source	Note null/negative outcomes	Outcome Measure Used	Reliability	ES
Outcome #1:	☐ Primary ☐ Secondary ☐ Unknown	☐ Child ☐ Teacher ☐ Parent/sign. Adult ☐ Ecology ☐ Other Unknown		☐ Behavior ☐ Attitude ☐ Knowledge ☐ Other ☐ Unknown	Self Report ☐ Parent Report ☐ Teacher Report ☐ Observation ☐ Test ☐ Other Unknown				
Outcome #2	☐ Primary ☐ Secondary ☐ Unknown	☐ Child ☐ Teacher ☐ Parent/sign. Adult ☐ Ecology ☐ Other Unknown		☐ Behavior ☐ Attitude ☐ Knowledge ☐ Other ☐ Unknown	Self Report ☐ Parent Report ☐ Teacher Report ☐ Observation ☐ Test ☐ Other Unknown				
Outcome #3:	☐ Primary ☐ Secondary ☐ Unknown	☐ Child ☐ Teacher ☐ Parent/sign. Adult ☐ Ecology ☐ Other Unknown		☐ Behavior ☐ Attitude ☐ Knowledge ☐ Other ☐ Unknown	Self Report ☐ Parent Report ☐ Teacher Report ☐ Observation ☐ Test ☐ Other Unknown				
Outcome #4:	Primary ☐ Secondary ☐ Unknown ☐	Child ☐ Teacher ☐ Parent/sign. Adult ☐ Ecology ☐ Other ☐ Unknown		☐ Behavior ☐ Attitude ☐ Knowledge ☐ Other ☐ Unknown	Self Report ☐ Parent Report ☐ Teacher Report ☐ Observation ☐ Test ☐ Other ☐ Unknown				
Outcome #5:	Primary ☐ Secondary ☐ Unknown ☐	☐ Child ☐ Teacher ☐ Parent/sign. Adult ☐ Ecology ☐ Other ☐ Unknown		Behavior ☐ Attitude ☐ Knowledge ☐ Other ☐ Unknown ☐	Self Report Parent Report ☐ Teacher Report ☐ Observation ☐ Test ☐ Other ☐ Unknown				

Type of Data Effect Size is Based On	Confidence Rating in ES Computation
(check all that apply) Means and SDs *t* - value or *F* – value Chi-square (*df* = 1) Frequencies or proportions (dichotomous) Frequencies or proportions (polytomous) Other (specify): Unknown	(select one of the following) Highly estimated (e.g., only have *N* p value) Moderate estimation (e.g., have complex but complete statistics) Some estimation (e.g., unconventional statistics that require conversion) Slight estimation (e.g., use significance testing statistics rather than descriptives) No estimation (e.g., all descriptive data is present)

F. Implementation Fidelity

F1. Evidence of Acceptable Adherence (answer F1.1 through F1.3)

F1.1 [x] Ongoing supervision/consultation
F1.2 [ ] Coding intervention sessions/lessons or procedures
F1.3 [ ] Audio/video tape implementation (select F1.3.1 or F1.3.2):

F1.3.1 [x] Entireintervention
F1.3.2 [ ] Part of intervention

F2. Manualization (select all that apply)

F2.1 [x] Written material involving a detailed account of the exact procedures and the sequence in which they are to be used

F2.2 [x] Formal training session that includes a detailed account of the exact procedures and the sequence in which they are to be used

F2.3 [x] Written material involving an overview of broad principles and a description of the intervention phases

F2.4 [ ] Formal or informal training session involving an overview of broad principles and a description of the intervention phases

F3. Adaptation procedures are specified (select one) [x] yes [ ] no [ ] unknown

Rating for Implementation Fidelity (select 0, 1, 2, or 3)**:** [ ] **3** [x] **2** [ ] **1** [ ] **0**

G. Replication (answer G1, G2, G3, and G4)

G1. [ ] Same Intervention
G2. [ ] Same Target Problem
G3. [x] Independent evaluation

Rating for Replication (select 0, 1, 2, or 3)**:** [ ] **3** [ ] **2** [x] **1** [ ] **0**

H. Site of Implementation

H1. School (if school is the site, select one of the following options)

H1.1 [x] Public

H1.2 ☐ Private
H1.3 ☐ Charter
H1.4 ☐ University Affiliated
H1.5 ☐ Alternative
H1.6 ☐ Not specified/unknown

H2. Non School Site (if it is a non-school site, select one of the following options)

H2.1 ☐ Home
H2.2 ☐ University Clinic
H2.3 ☐ Summer Program
H2.4 ☐ Outpatient Hospital
H2.5 ☐ Partial inpatient/day Intervention Program
H2.6 ☐ Inpatient Hospital
H2.7 ☐ Private Practice
H2.8 ☐ Mental Health Center
H2.9 ☐ Residential Treatment Facility
H2.10 ☐ Other (specify):_____
H2.11 ☐ Unknown/insufficient information provided

Rating for Site of Implementation (select 0, 1, 2, or 3)**:** ☐ **3** ☒ **2** ☐ **1** ☐ **0**

I. Follow-Up Assessment

☐ Timing of follow up assessment: specify 6 month follow up planned

☐ Number of participants included in the follow up assessment: specify 6 month follow up data not included due to high attrition, only 32% of participants reporting back at 6 month assessment point, yielding insufficient power.

☐ Consistency of assessment method used: specify_____

Rating for Follow-Up Assessment (select 0, 1, 2, or 3)**:** ☐ **3** ☐ **2** ☐ **1** ☒ **0**

III. Other Descriptive or Supplemental Criteria to Consider

A. External Validity Indicators

A1. Sampling procedures described in detail ☒ yes ☐ no

Specify rationale for selection: parents with children between ages of 6 and 11, BMI higher or equal to 85%

Specify rationale for sample size: convenience sample

A1.1 Inclusion/exclusion criteria specified ☒ yes ☐ no

A1.2 Inclusion/exclusion criteria similar to school practice ☒ yes ☐ no

A1.3 Specified criteria related to concern ☒ yes ☐ no

A2. Participant Characteristics Specified for Treatment and Control Group

Participants from Treatment and Control Group	Grade/age	Gender	Ethnicity or Multi-ethnic	Ethnic Identity	Race(s)	Acculturation	Pri - mary Lan- guage	SES	Family Struc- ture	Locale	Disability	Functional Descriptors
☐ Child/Student ☐ Parent/caregiver ☐ Teacher ☐ School Other	Mean age of 39.9 years	85.6% female, rest male	Multi ethnic		African American- 60.7% White- 36.9% Latino- 1.2% Multiracial-1.2%		English	41.7% reported income of less than 35 000US	47.2% married 34.8% single 12.4% divorced 5.6% seperated		none	

A3. Details are provided regarding variables that:

A3.1 Have differential relevance for intended outcomes ☒ yes ☐ no

Specify: _____

A3.2 - Have relevance to inclusion criteria [x] yes [ ] no

Specify: _____

A4. Receptivity/acceptance by target participant population (treatment group)

Participants from Treatment Group	Results (What person reported to have gained from participation in program)	General Rating
[ ] Child/Student [ ] Parent/caregiver [ ] Teacher [ ] School [ ] Other	High report of satisfaction, with 91% strongly agreeing that they would recommend this group to others. 91% reported they were eating healthier. Reported that 12 sessions were too many.	[ ] Participants reported benefiting overall from the intervention [ ] Participants reported not benefiting overall from the intervention

A5. Generalization of Effects:

A5.1 Generalization over time

A5.1.1 Evidence is provided regarding the sustainability of outcomes after intervention is terminated [ ] yes [x] no

Specify: no 6 month follow up

A5.1.2 Procedures for maintaining outcomes are specified [ ] yes [x] no

Specify: _____

A5.2 Generalization across settings

A5.2.1 Evidence is provided regarding the extent to which outcomes are manifested in contexts that are different from the intervention context [x] yes [ ] no

Specify: focus on being culturally sensitive and open to all ethnicities

A5.2.2 Documentation of efforts to ensure application of intervention to other settings [ ] yes [x] no

Specify: _____

A5.2.3 Impact on implementers or context is sustained ☐ yes ☒ no

Specify: _____

A5.3 - Generalization across persons

Evidence is provided regarding the degree to which outcomes are manifested with participants who are different than the original group of participants for with the intervention was evaluated

☐ yes ☐ no

Specify: stated that program endeavors to be culturally tailored to all.

B. Length of Intervention (select B1 or B2)

B1. ☐ Unknown/insufficient information provided

B2. ☒ Information provided (if information is provided, specify one of the following:) B2.1 weeks 12
N

B2.2 months _____
N

B2.3 years _____
N

B2.4 other _____
N

C. Intensity/dosage of Intervention (select C1 or C2)

C1. ☐ Unknown/insufficient information provided

C2. ☒ Information provided (if information is provided, specify both of the following):

C2.1 length of intervention session 90 minutes
N

C2.2 frequency of intervention session once a week over 12 weeks
N

D. Dosage Response (select D1 or D2)

D1. ☐ Unknown/insufficient information provided

D2. ☐ Information provided (if information is provided, answer D2.1)

D2.1 Describe positive outcomes associated with higher dosage: _____

E. Program Implementer (select all that apply)

E1. ☐ Research Staff
E2. ☐ School Specialty Staff
E3. ☐ Teachers
E4. ☐ Educational Assistants
E5. ☐ Parents
E6. ☒ College Students
E7. ☐ Peers
E8. ☐ Other
E9. ☐ Unknown/insufficient information provided

F. Characteristics of the Intervener

F1. ☐ Highly similar to target participants on key variables (e.g., race, gender, SES)
F2. ☒ Somewhat similar to target participants on key variables
F3. ☐ Different from target participants on key variables

G. Intervention Style or Orientation (select all that apply)

G1. ☐ Behavioral
G2. ☒ Cognitive-behavioral
G3. ☐ Experiential
G4. ☐ Humanistic/interpersonal
G5. ☐ Psychodynamic/insight oriented
G6. ☐ Other (specify):_____
G7. ☐ Unknown/insufficient information provided

H. Cost Analysis Data (select G1 or G2)

H1. ☒ Unknown/insufficient information provided
H2. ☐ Information provided (if information is provided, answer H2.1)

H2.1 Estimated Cost of Implementation:_____

I. Training and Support Resources (select all that apply)

I1. ☐ Simple orientation given to change agents
I2. ☐ Training workshops conducted

# of Workshops provided _____

Average length of training _____

Who conducted training (select all that apply)

I2.1 ☐ Project Director
I2.2 ☒ Graduate/project assistants

I2.3 ☐ Other (please specify):
I2.3 ☐ Unknown

I3. ☐ Ongoing technical support
I4. ☒ Program materialsobtained
I5. ☐ Special Facilities
I6. ☐ Other (specify):

J. Feasibility

J1. Level of difficulty in training intervention agents (select one of the following)

J1.1 ☐ High
J1.2 ☐ Moderate
J1.3 ☐ Low
J1.4 ☒ Unknown

J2. Cost to train intervention agents (specify if known): _____

J3. Rating of cost to train intervention agents (select one of the following)

J3.1 ☐ High
J3.2 ☐ Moderate
J3.3 ☐ Low
J3.4 ☒ Unknown

Summary of Evidence for Group-Based Design Studies

Indicator	Overall Evidence Rating NNR = No numerical rating or 0 - 3	Description of Evidence Strong Promising Weak No/limited evidence or Descriptive ratings
General Characteristics		
General Design Characteristics		
Statistical Treatment		
Type of Program		
Stage of Program		
Concurrent/Historical Intervention Exposure		
Key Features		
Measurement	0	Did not use multiple sources or measures, no reporting of validity or reliablility
Comparison Group	2	Waitlist control group
Primary/Secondary Outcomes are Statistically Significant		
Educational/clinical significance		
Identifiable Components		
Implementation Fidelity	2	Manualised and recorded, training sessions not reported.
Replication	1	
Site of Implementation	2	Public site
Follow Up Assessment Conducted	0	No follow up assessment