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BARRIERS TO NURSING INTERVENTIONS TO REDUCE CHILDHOOD OBESITY
RATES:
A LITERATURE REVIEW

by

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A thesis submitted in fulfillment of the requirements
for Honors in the Major Program in Nursing
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ABSTRACT

Childhood obesity is a growing epidemic in the United States that has short-term and long-term health consequences for the children affected. Nurses are patient advocates and are responsible for speaking up for the patient; in the pediatric population, a nurse must act as an advocate on behalf of the child. The purpose of this literature review is to look at different barriers to nursing interventions in regard to childhood obesity. A literature review was done by using different databases, with 11 articles having similar themes and interventions used. The main themes from the literature review were parental willingness and involvement in weight loss strategies with their child, a lack of training for nurses in the area of childhood obesity, and a lack of standardized assessment methods for charting and tracking children's weight status. The research suggests that the more involved a parent is, the more successful the child's weight loss will be. Additionally, an overall lack of training in health promotion was noted among nurses along with a feeling of discomfort when speaking to parents and children about the child's weight, indicating a need for further education in health promotion techniques. Finally, articles did not commonly use a standardized assessment method to track weight status in the pediatric population, making cross-examination of different results difficult and points to a need for a standardized measure that is as objective as possible, such as a body fat percentage measure.

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INTRODUCTION

Childhood obesity is one of the largest growing public health concerns of the 21st century. Both developing and developed countries are seeing rising numbers of overweight and obese children. The global prevalence of overweight and obese children ages 5 – 17 is 18.5% (Hales, Carroll, Fryar, & Ogden, 2017). The numbers are even worse in the United States (Mohamed, 2015). According to the Centers for Disease Control and Prevention (CDC), in 2015-2016, one out of every five school-aged children and adolescents were obese (Hales, Carroll, Fryar & Ogden, 2017). The primary measure used for overweight and obesity is body mass index (BMI), a value determined using the weight and height of an individual. The CDC (2016) defines obesity in children and adolescents as a BMI above the 95th percentile, for age and gender. Obesity in childhood is of such concern due to co-morbidities associated with obesity in children, including: hypertension, hyperlipidemia, type 2 diabetes, respiratory issues (i.e. asthma), joint and musculoskeletal problems, liver and gallbladder disease, anxiety, depression, lower self-esteem, and quality of life, social stigmas, future heart disease and cancers (CDC, 2016). One of the most potent risk factors for childhood obesity is the presence of one or both parents being overweight or obese themselves. Brandt (2004) identified parental obesity as the primary risk factor but also found that 48% of children with overweight parents would eventually become overweight themselves compared to only 13% of children with normal-weight parents. Studies such as this stress the importance of parental factors relating to child overweight and obesity, as lifestyle behavior patterns of parents, such as food and physical activity, are often passed down to children.

One of the roles of nurses is to engage in health promotion regularly. The World Health Organization (WHO; 2018) defines health promotion as the “process of enabling people to

increase control over the determinants of health and thereby improving their health” (para 1). Nurses try to promote primary healthcare; using education and nursing interventions to prevent health care issues. With children, the nurse must promote healthy lifestyle habits to both the child and their parent or caregiver, which may ultimately prevent childhood overweight and obesity and the associated co-morbidities. As the patient’s advocate, the nurse must do whatever possible to help the child remain healthy and prevent health problems in the future. Different nursing interventions have been tested to determine the most effective approach in reducing childhood obesity, interventions directly with the children and indirectly through their parents or caregivers.

BACKGROUND

Interventions by nurses are one method for helping combat childhood obesity. Many interventions involve both the parent(s) and the child, making changes in some aspect of their lifestyle to help reduce childhood obesity. With the growing incidence of childhood obesity, it is important to determine barriers to different nursing interventions with parents and children when addressing the topic.

One of the most concerning findings regarding childhood obesity is the lack of parental knowledge of their child's condition. Some nurses report the most significant resistance to managing the child's weight, nutrition, and activity as lack of parental engagement in behavioral changes (Tanda, Beverly, & Hughes, 2017, p. 767). Most parents commonly underestimated their children's weight – not being aware of the ideal weight range for their child – and don't feel as though intervention is necessary since they do not see a problem. Another study found similar results, stating parental knowledge gaps as a huge indicator that could be remedied with early and sustained engagement (McPherson, et al., 2016). Similar to Tanda, et al. (2017), a study by Kelleher, Harrington, Shiely, Perry & McHugh (2017) found difficulty in implementing an interdisciplinary approach to eradicating childhood obesity due to lack of parental knowledge. Specifically, parents were often not aware of their child's excess weight, and when informed, were unwilling to accept their child's obesity.

Despite parental resistance to interventions, a nurse's primary role is being the patient's advocate. As a patient advocate, some studies have focused interventions on the child, with specific recommendations and interventions given after to the parent and child, with later follow-up appointments to evaluate outcomes. One example of this direct nursing intervention is a study where nurse practitioners (NPs) were interviewed on their specific interventions when a child is

overweight or obese. The NPs reported assessing diet and physical activity, with one-half charting BMI on growth charts to track trends and changes in the child's weight during subsequent visits. Out of these NPs, only a small proportion reported "always" giving information and guidance to the parent and child about weight loss, tracking the weight over later visits, or giving a referral to a dietician or other subspecialty. Further, the NPs reported weight status "infrequently" even in at-risk children (Tanda, et al., 2017). The study of self-reported behavior demonstrates proper assessment by nurses and NPs, but a lack of follow-through on intervention and evaluation. A community-level pilot program sought to further the nurses' intervention and evaluation. Group sessions were delivered at a community center with information centered around education and practical applications of childhood obesity. The group sessions faced a set-back in uptake by the community, however, as parents were reluctant to show up due to the negative social stigma of obesity. Another issue was a lack of clear boundaries between the interdisciplinary teams, making a holistic approach by team members difficult (Kelleher, et al., 2017).

The lack of nursing intervention does not stem from laziness or lack of awareness; instead, it frequently is reported to originate from roadblocks of teaching the child's family. Nurses at a Child Health Center in Sweden reported facilitators and deterrents in promoting healthy practices. Nurses reported that they never really avoided communicating with parents, but that it was easier to communicate if the child was overweight rather than obese. Nurses also reported feeling extremely uncomfortable bringing up the topic if the parent was either overweight or obese because they felt they were indirectly critiquing the parent as well. The nurses also reported having to handle the situation lightly, to encourage parent compliance and not scaring them into backing out of treatment (Regber, Mayrild, & Johansson, 2013). Similar

research reported school nurses' apprehension in discussing an obese child's BMI with the parents due to a fear of negative responses. School nurses also reported feeling more concerned when a child's parents did not believe their child to be overweight or obese and were worried about creating a conflict by angering parents (Quelly, 2014). Another study at Child Care Centers in Sweden found that many nurses mentioned difficulties in speaking to the parents about their child being overweight or obese, especially when the family life was complicated or if the parents themselves struggled with being overweight or obese. The nurses felt they were adequately informed and could provide good care of the child but were "somewhat" uncomfortable when discussing the child's condition with the parent or caregiver (Ljungkrona-Falke, Brekke, Nyholm, 2014).

Despite the parents acting as a roadblock in the nurses' comfort in providing education and care, a significant factor contributing to nurses intervening when a child is overweight or obese is lack of the nurse's knowledge about the issue and appropriate interventions and lack of training. Half of the nurse practitioners who have received more advanced education than a registered nurse reported a lack of knowledge on childhood obesity, physical activity and dietary guidelines (Tanda, et al., 2017). Another study's results reported the most significant obstacle to providing care for overweight and obese children was lack of clinical practice in the area and lack of education about the condition. The results of the study led to the recommendation of full education about childhood obesity and interventions for providers and nurses alike (McPherson, et al., 2016). Similar studies also found significant ($p < 0.001$ or $p < 0.01$) positive correlations between the level of health promotion and the school nurses' years of experience, years in their current position, and the nurses' age. Additionally, there was also a significant difference ($p < 0.001$) between nurses with higher levels of education (masters' or doctorates' degrees)

versus nurses with only the basic levels of education (associates' or bachelors' degrees) and participation in child weight status practices, indicating education plays a role in health promotion practices concerning childhood obesity (Quelly, 2017). Not only is education about intervention lacking, but there is also a general lack of training in health promotion due to perceived low priority among nurses. This lack of health promotion training and education is due to a lack of training, time, resources and parental motivation for change.

PROBLEM

The number of overweight and obese children in the United States only continues to rise throughout the twenty-first century. This issue must be addressed by healthcare professionals (Mohamed, 2015). One issue that parents often are not aware of the fact that their child is obese and don't think changes are necessary (Tanda, Beverly, & Hughes, 2017 & McPherson, et al., 2016). When the parent is unaware of their child's weight status, they are unaware of the negative health consequences associated with the excess weight and are unmotivated to make changes. One of the most important roles of a nurse is to function as a patient advocate, especially for vulnerable populations, such as children. As patient advocates, nurses must be involved in interventions to help prevent childhood obesity and provide more health promotion techniques. Therefore, nurses must bring up the topic of the child's weight, as uncomfortable as it may be, to advocate for the child and inform parents about their child's health. When bringing up weight to a parent, nurses often report feeling uncomfortable talking about an obese child to their parent and feeling as though they don't know adequate health promotion techniques to pass onto the parent (McPherson, et al., 2016, Lewis & Greenwood, 2015, & Ljungkrona-Falk, et al., 2014).

One method for preventing and managing childhood obesity is through healthy lifestyles, including proper nutrition and physical activity. As parents are primarily responsible for establishing the household environment, including foods eaten and promotion of physical activity, nurses must use any opportunity to educate parents about health lifestyle habits and the detrimental effect of excess weight in children.

PURPOSE

The purpose of this literature review is to evaluate barriers faced by nurses when attempting to implement interventions to address the problem of childhood obesity. In particular, interventions that address healthy lifestyle education and health promotion will be evaluated.

METHODS

A literature review was performed to determine the barriers to nursing interventions and implementing health promotion in reducing childhood obesity. The first step was searching key terms in the EBSCOhost database: Parent* OR Famil*; Child* OR Adolescen* OR Teen*; Obes* OR Overweigh* OR Body Mass Index, OR BMI OR Fat OR Weight; Interperson* OR Warm* OR Love OR Affection OR Communicat* OR Attitude*; Nurs*. The databases that were included in the search are: Cumulative Index to Nursing and Allied Health Literature (CINAHL), Cochrane Database of Systemic Reviews, Medical Literature On-Line (MEDLINE), and Psychological Information (PsycINFO). When looking for an article, the articles included in this review were peer-reviewed, published in or after 2004, written in the English language, and cannot be only literature reviews. After the initial search, 1,180 results were found; after exclusion criteria were applied and duplicates were removed, 508 results were found. Eleven articles meeting the exact search criteria that were relevant to the purpose of this literature review were found, reviewed, and incorporated into the review.

The articles were then analyzed based on similar findings while recording the main ideas. The main concepts from each article, as well as interventions and limitations, were then addressed and recommendations based on these articles were added. To analyze the common themes and results of the literature search, a table of evidence was constructed from all 11 articles. The table of evidence includes the population, the number of participants in the study, interventions utilized, results found, and a summary of the overall article. The table of evidence was then used to find common themes among the different articles.

RESULTS

In this literature review, there are three significant distinctions as sources of barriers to nurses preventing and treating childhood obesity. The most significant barrier is parental willingness and openness to instituting change in their child's lifestyle habits. Additionally, nurses' lack of training in health promotion acts as another barrier. Finally, the research found a lack of consistent measurement and assessment as a barrier.

Parental Willingness and Openness

In the articles synthesized for the literature review, seven showed parents as being a significant factor in whether their child would be able to maintain a healthy weight if proper interventions were employed (Tanda, et. al., 2017; Wright, et. al., 2013; McPherson, et. al., 2016; Kelleher, et. al., 2017; Bennett & Sothern, 2009; Golan & Crow, 2004; Golan & Crow, 2012). The most significant impact on the success of a child in a program, no matter the type of intervention, was parental participation and readiness to make changes with the child. For the child to openly participate in the program, the parent had to express their approval to the child and also be willing to change with the child by modeling the behaviors. In fact, the largest barrier healthcare providers faced when attempting to change a child's behavior was lack of parental engagement. In Wright, et. al. (2013), this is seen when the child and parent both received interactive voice technology calls allowing them to set healthy goals together, the children who were high users of the technology with their parents showed statistically significant ($P < .05$) decreased weight, BMI, and BMI z-scores when compared to the non-users. In a different study (Tanda, et. al., 2017), 64.5% of nurse practitioners interviewed ($n = 100$), they responded that parental resistance to changes for the child was the most significant barrier to childhood obesity counseling. Several articles suggested that the lack of parental involvement could be due to a

lack of knowledge about the long-term effects on the child and what the healthy weight standards were for a child at that particular age (Tanda, et. al, 2017; McPherson, et. al., 2016; Kelleher, et. al, 2017). In a study conducted about setting the research agenda for childhood obesity, 71 knowledge gaps were identified by participants at the conference, with one of the largest themes being “early, sustained engagement of families” (McPherson, et. al., 2016). Conversely, when parents were actively participating and modeling the healthy changes, the child was much more likely to lose the weight and maintain that healthy weight during follow-up than those children who did not have their parent participating and who underwent treatment independently. In particular, Golan and Crow’s (2012) article showed 60% of participants in the parent-involved group maintained their non-obese status after seven years’ follow-up compared to only 31% in the child-only group.

Nurses’ Lack of Training

One of the roles of a nurse is to provide health promotion to all patients, no matter the topic, as they are the patients’ advocate. However, in the studies that looked at nurses perceptions and roles in helping their patients who were obese, one of the most reported barriers was a lack of training in health promotion regarding healthy weight and standards for maintaining or reaching the goal weight (Tanda, et. al, 2017; McPherson, et. al., 2016; Kelleher, et. al., 2017; Regber, et. al., 2013; Ljungkrona-Falk, et. al., 2014; Lewis & Greenwood, 2015). Most nurses reported that they were unsure how to educate the patient about methods to reduce their weight properly and how to apply their knowledge in a clinical setting. Even nurse practitioners, in a study of 100 NPs, approximately one-half of the respondents said they “lacked knowledge on childhood obesity, physical activity and dietary guidelines” (Tanda, et. al., 2017). Many nurses also reported they felt uncomfortable discussing a child’s weight, especially when

the child was obese, for fear of the parents' reaction. In Ljungkrona-Falk, et. al. (2014), 35 (or 56.5% of total respondents) responded they "somewhat agreed" with the statement "I find it difficult to talk with parents about their child's obesity" as relating to their own fear and uncertainty when faced with the topic. So while most nurses did report that they felt it was their responsibility to act as the child's advocate, they felt unprepared to address the problem due to their lack of training, proper resources available to them, and fear of parental repercussion (Lewis & Greenwood, 2015). Even nurses who reported feeling like they had adequate knowledge about proper nutrition for the child felt uncomfortable with discussing the problem with the child's parents, especially if one or both of the child's parents were overweight or obese or if the nurse perceived a complicated home life (Ljungkrona-Falk, et. at., 2014).

Lack of Consistent Assessment Methods

A significant finding in most articles, whether intentionally looking at the topic or not, was a lack of a consistent, objective way for nurses and other healthcare personnel to chart and track a child's weight to determine if the child was within a healthy range or not (Tanda, et. al., 2017; Wright, et. al., 2013; Regber, et. al., 2013; Decker, 2011). The most commonly used tool is a BMI chart, which also allows the nurse to objectively speak to the parents without making the topic feel personal or rude. The BMI chart is also designed to be relatively easy to understand and is a simple visual tool for parents to reference (Regber, et. al., 2013). However, not every nurse reported using the BMI chart and used different means to track the child's weight status instead. In Regber, et. al. (2013), nurses who used the BMI scale allowed a greater understanding of a child's weight status for the nurse and parent, but nurses used it inconsistently. Some nurses stated using only a visual inspection of body weight (in which case, these children who were deemed as "normal weight" were found obese consistently), using height and weight percentile

chart (because charting incorrectly only slightly could lead to an improper weight status and was more confusing for parents to interpret) and doing a manual calculation of BMI (which oftentimes led to parents not knowing their child's BMI until their next wellness visit) (Regber, et. al., 2013). Using any of these aforementioned methods are not objective and not sticking to a standardized system can also contribute to nurses' unease when it comes to speaking to the parent about their child's weight, this leads to nurses not reporting weight status for children who are at-risk (Regber et al., 2013; Tanda et al., 2017). Without a standardized tool in place, this continues to add to the barriers nurses face when tasked with speaking about a child's weight to the parents. Lack of standardization and consistency leads to nurses feeling as though they are making more subjective assumptions about the child, leading to fewer nurses reporting a child's weight status and fewer nurses educating the parents on health promotion than if there was an objective tool in place that was used and recorded at every health visit to track the child's changes.

DISCUSSION

Parental Willingness and Openness

One of the most significant influences in pediatric patients across all developmental stages is the perspective and actions of their parent or guardian. Children tend to mimic or mirror parental behaviors or cues and use these to develop their personality and character (Vissers, et. al., 2016; Golan & Crow, 2012). The same remains true when it comes to interventions concerning pediatric obesity. While some pediatric cases were able to implement changes in the child's weight status, the most effective interventions came when the parent was involved in the treatment regimen as well. The parent had not only to be involved in the treatment though but also had to show interest in and dedication to changing behaviors to better the child's weight status. If the parent showed little interest in changing lifestyle habits or was not consistent with keeping up with different interventions, children were consistently less likely to follow-through with the plan and had markedly less success in weight loss therapies. Conversely, parents were less likely to engage in a weight-loss intervention with their child if they did not believe their child was obese or if they did not have adequate knowledge of what the purpose of the intervention was.

Because parents are such a strong influence on whether the child will successfully complete an intervention to lose weight, it is important to remember from a nursing standpoint to include the parent in any interventions with the child. This includes educating the parent about their child's weight status, education about the purpose and procedure of the intervention, and emphasizing the importance of the parent partaking in the change while showing positivity about the change in front of the child. In the studies reviewed, when parents are involved in weight loss

with the child, the children are more successful in losing excess body weight and keeping that weight off.

Nurses' Lack of Training

Similar to the finding of parents needing to play a role in weight loss interventions, many studies also found that nurses felt uncomfortable discussing a child's weight status with the parents and felt unprepared to give information or recommendations about health promotion for maintaining a healthy weight. Most nurses felt as though it was their duty to inform the parents and do an intervention to help the child but felt as though they were criticizing the parenting style or that they didn't have any advice to give. This shows a lack of health promotion training in registered nurses. It remains essential for nurses to be aware of and receive specialized health promotion training regarding the population of patients they will be taking care of. In the case of pediatric nurses, healthy body weight measurements and health promotion topics (i.e., healthy diet, regular exercise, etc.) should be reviewed by the unit during orientation, so the nurses are equipped to deliver information and educate the patients and their parents. They should also be able to relay weight statuses that may have negative co-morbidities associated with them to the healthcare provider for potential treatment plans or referrals, if necessary. If nurses were given a standardized health promotion training by the unit they work on, they would feel more confident in their ability to educate parents about healthy weights for the child and possible interventions the parent could make at home with the child. Similarly, if given concrete, factual information, and references, the nurse could cite these sources to parents and would not feel as though the information presented was subjective to only some patients but could be delivered uniformly to all patients.

Lack of Consistent Assessment Methods

One of the problematic things while conducting the literature review was the lack of uniformity throughout articles in how they measured the participant's weight status. Most articles used BMI as an indicator for weight status, while others used different assessment measures such as visceral adipose tissue or percent weight loss (Daniels, 2009). Because there is no consistent method of weight assessment measurement among research, this makes direct comparisons between various weight loss interventions challenging to assess due to having to compare different units of measure. If one standard body measurement were used throughout pediatric weight research, as well as in offices when educating parents, this would make comparisons among different trials and patients more straightforward to assess effectiveness. Similarly, if every office used the same weight status assessment method, parents would have an objective measure of their child's weight status regardless of location.

Additionally, with a uniform system, nurses would have another resource that provided an objective tool for speaking to parents about their child's weight status that would help to negate some of the discomfort associated with discussing a child being overweight or obese. Right now, the standard for weight status is the BMI tool; however, it is important to note that different BMI charts must be used for different genders and heights to get an accurate reading. This information must also be relayed to parents and to help the parents understand how weight status is determined. BMI can also have drawbacks though, as BMI does not accurately distinguish muscle mass from adipose tissue. Therefore, if a high-schooler comes in and is in weight training, wrestling, or another similar activity that requires high levels of muscle mass, their BMI would probably indicate the adolescent being overweight or even obese depending on the muscle mass. The drawbacks of using BMI is where other techniques could be useful to start using during office visits. One such method would be the use of body fat percentage. Body fat

percentage objectively measures the body fat percentage on an individual by sending an electric current through the body and does not take into account muscle mass when reading back the result (Sifferlin, 2013). Additionally, Vissers, Hens, Hansen, and Taeymans (2016) suggested that a sagittal abdominal diameter may be a better measure of interpreting weight loss during weight loss interventions; however, this measurement has only previously been done in weight loss trials with obese women and has yet to be tested in the pediatric population.

LIMITATIONS

This literature review does have some limitations. The search of literature holds possible limitations because resulting content may exclude relevant material due to the population type. The literature has much more evidence in relation to the general adult population and health promotion techniques to treat obesity whereas limiting the search to pediatric populations drastically reduces the number of results. Also, the terms used to search (“child”, adolescen”) could have limited results in articles that used key terms such as preschoolers, toddlers, or teenagers rather than a general pediatric population. Additionally, as research moved forward, other key terms that were critical to the literature review, such as barriers or impediments, could have been used during the initial search to yield more results.

The articles used for the literature review also had limitations within their research. Many of the articles only used small, focus groups – limiting the study’s generalizability and whether their results were significant for a larger population. Additionally, these studies were often under time constraints that only did interventions for short periods with only one article doing a longitudinal follow-up. Families who participate often have other obligations, such as other children or financial limitations, which inhibit their ability to follow-through with intensive weight management interventions and could potentially limit how involved a parent can get with the intervention.

CONCLUSION

Childhood obesity is a growing problem in the United States that can lead to several co-morbidities as the child continues into adulthood including Type 2 diabetes and cardiovascular disease. The purpose of this literature review was to evaluate barriers nurses face when implementing interventions for parents and children facing childhood obesity. The research suggests that the most important factor in successful intervention is to have the parents readily involved in the intervention with the child and to educate the parent about the condition to further encourage parental involvement. Additionally, having nurses training in health promotion topics to educate the parents each visit as well as having a consistent, objective assessment tool across research and healthcare visits would further prevent and help treat pediatric obesity.

APPENDIX A: TABLE OF EVIDENCE

Author	Population	Sample Size	Interventions	Results/Outcomes	Summary of Article
1. Tanda (Tanda, Beverly, & Hughes, 2017) (Tanda, et. al., 2017)	White, female NPs who had 6 months of practice experience and patient population of 2-17 year olds in Ohio	N = 371 155 included in the study	-Assess diet and physical activity -Promoted a healthy diet and physical activity frequently or always -Small proportion “always” provide specific guidance on weight loss, tracking of weight or referral	-Most significant resistance was lack of parent engagement in behavior -1/2 NPs lack knowledge on childhood obesity, physical activity and dietary guidelines -1/2 charted BMI on growth charts -Weight status was reported infrequently even for at-risk children	NPs are assessed for their promotion of healthy weight behaviors of children at routine visits. While most did promote healthy eating and weight, few went as far as to help implement these changes and track changes in weight status. This could be due to a lack of parental knowledge. Suggestions: making tracking of weight automated; use healthy habits questionnaire; document BMIs; institute promotion at all ages for all patients
2. Wright (Wright, et. al, 2013)	9-12 year old obese children and their parents; the majority were African-American, low-income (<40K), and high-school educated	N=50 ½ in HEAT and ½ placebo IVR = interactive voice response	-12-week telephone counseling service by automated IVR system for HEAT -Behavior counseling tool -Designed to monitor, educate, and counsel parents and children on healthy weight management and TV time	-HEAT parents consumed 1 more cup of fruit per day -HEAT parent who were high users consumed less calories -HEAT shows possibility of translating programs with known effectiveness into a fully automated treatment program using IVR technology	This is a telephone system where both children and their parents talk on the phone with IVR that teaches them about healthy choices and has them set goals together. The phone calls are separate, but the parent and child are supposed to work together through this program to become healthier. The N was very small, so addition differences may be seen in a larger group. Suggestions: use a website instead of phone
3. McPherson (McPherson, et. al., 2016)	Attendees to a live workshop series (researchers, frontline clinicians, trainees, former clients w/ disabilities, parents, community partners, and decision makers)	N=38	-2 live presentations by parents of children with disabilities who shared struggles of disabled child being overweight -20-30 min. presentations providing scientific evidence	-The biggest requirement attendees found was early and sustained engagement of families -Knowledge gaps in the families was a huge indicator -The largest obstacle was clinical practice and education	Disabled children are oftentimes left out of pediatric obesity studies, despite the population also experiencing a rise in pediatric weight. The purpose of the convention was to develop interventions to help the families with disabled children. The best thing they decided to do was to

			<p>behind characteristics of effective weight management programs</p> <ul style="list-style-type: none"> -Attendees wrote detailed written plans to guide initial research efforts 	<ul style="list-style-type: none"> -need to find family priorities and find the acceptability and feasibility of interventions with parents -have to consider outside, additional family commitments 	<p>engage the families as early and frequently with possible during health care visits – where the providers and nurses would be expected to be educated on the matter.</p> <p>The limitation is these interventions have not yet been implemented in the population.</p>
<p>4. Kelleher</p> <p>(Kelleher, Harrington, Shiely, Perry, & McHugh, 2017)</p> <p>(Kelleher, et. al, 2017)</p>	<p>All stakeholders in an Irish community</p>	<p>N=29</p>	<ul style="list-style-type: none"> -Community-level pilot program -Took place in a community healthcare office -Subsequent group sessions were delivered on weekdays in the afternoon at a local sports or community center 	<ul style="list-style-type: none"> -Difficult to do an interdisciplinary approach because members are uncertain others' roles and knowledge -Low program uptake during implementation -Many parents aren't aware of excess weight and don't want to accept child is obese -Need positive awareness-raising campaigns 	<p>This is a study about implementing a community-based pilot program about education and practical applications for reducing body weight. It is currently only in a pilot stage and had problems with the interdisciplinary approach used in the set-up. The program also faced resistance from parents who lacked awareness that their child needed help and therefore raised the need for positive awareness campaigns.</p>
<p>5. Regber</p> <p>(Regber, Mayrild, & Johansson, 2013)</p> <p>(Regber, et. al., 2013)</p>	<p>Nurses working at Child Health Center in Sweden – must be pediatric or district nurses, actively working, and voluntary participants</p>	<p>N= 15 nurses (all female)</p>	<ul style="list-style-type: none"> -Using inspection as a means for weight estimation vs. height and growth chart vs. BMI chart -An RN initiating a conversation about child's weight vs. parental concern vs. RN not starting a conversation because too sensitive -Questionnaire on food and activity habits for 18 months and 2 and ½ year old's but had difficulty gathering parents afterwards 	<ul style="list-style-type: none"> -The BMI tool is the most accurate predictor of a child being overweight or obese and also allows an objective talking point for nurse's when children have reached a certain point -The BMI chart is also relatively easy to understand, which makes it a good visual reference for every parent to understand even if they are unfamiliar with the healthcare field -Parents might not allow their children to engage in active play because they don't want the child to get dirty or believed the child got enough play at school during the day 	<p>Overall, the article used nurses' experiences to determine facilitators and deterrents to childhood obesity. A facilitator that nurses could use is the BMI chart, taking the initiative to talk to the parents, not avoiding the topic if the parent becomes negative, education about health promoting activity, and preventive activities. Conversely, the deterrents of prevention by nurses is when they use visual inspection of body weight only, only use a height and weight chart (which don't allow for adequate identification of overweight or obese), manual calculation of BMI (not always accurate and not done frequently because of time</p>

					constraints), avoidance or delayed information, and voluntariness (parents do not have to take children to dietician).
6. Ljungkrona (Ljungkrona-Falk, Brekke, Nyholm, 2014) (Ljungkrona-Falk, et. at., 2014)	Nurses working in the Child Health Care Centers in Sweden	N=17 (focus group interviews) N=62 questionnaires returned	Extended dialogue with parents about unhealthy behaviors with their children	-Many nurses mentioned difficulties in speaking to parents about their child being overweight or obese -Nurses had more trouble bringing up the issue when they felt the family life was complicated and/or the parents themselves struggled with being overweight or obese	The study didn't look at nursing interventions with these nurses, but instead sought insight about how comfortable the nurses' felt when discussing a child's weight with the parent. The nurses reported feeling like they gave adequate care and had good knowledge of nutrition but were "somewhat" uncomfortable when discussing an overweight/obese child's problems to his/her parents. This feeling of unease was even more pronounced when the parents were also overweight or obese.
7. Greenwood (Lewis & Greenwood, 2015)	Nurses in the child's ward of a district hospital	N=6	-Semi-structured interviews about the importance of health promotion the acute care setting -Questions were asked regarding what the nurses used as their interventions when speaking to the child and parents	-All nurses agreed they had a responsibility of health promotion to the children and young people -Didn't think acute care setting was an appropriate time for health promotion -Viewed parents as a barrier to delivering health promotion (significant factor) -Lack of training in health promotion (and low priority)	Nurses reported the importance of health promotion and how it was their responsibility of the nurse as the child's advocate. However, the nurses reported not following through with health promotion in weight issues due to lack of training, time, resources and parental motivation. The sample size was very small and had similar characteristics (all worked on the same ward) so a larger sample size would have to be used. I think the lack of follow-through with the health promotion signifies a need for standardized health promotion regarding child's weight regardless of parental circumstances.
8. Bennett	Behavioral treatment, diet, and physical activity in children that are healthy weight,	40 references used during analysis	Age- and sex-specific BMI growth charts were used for diagnosing and tracking	-Low-GI (glycemic index) diet groups displayed a significant decrease in fat and BMI and low-carb diets resulted in	When changing the diet of a child, it is important to remember that caution should be used due to the limited research available and the

(Bennett & Sothorn, 2009)	overweight, obese or severely obese.		obesity. Weight, BMI, and fat mass were all key outcome measures. Once the child was diagnosed with obesity, the child then located and enrolled in the appropriate treatment program. -Pedometers or accelerometers are objective measures of physical activity	larger weight loss than low-fat diets -Obese children show a significant difference in exercise tolerance when comparing their oxygen consumption to those who are not obese -Significant improvements were seen in programs that used high-repetition strength training with moderate intensity aerobic exercise -Parents need to be involved in treatment and treatment should not begin until the parents are ready and accepting of the program	lack of knowledge about long-term effects. Diet changes should only be used when other treatments are ineffective or in severe cases. While dietary, physical activity, and behavioral changes are very critical to altering a child's weight status, the parents play a key role in making a change in the child. The parents are especially critical in children undergoing programs who are under the age of 12 due to the parental control of their environment at this age. This study does identify some flaws with implementing the interventions listed in the chosen articles – all have financial and time limitations for the families participating, so this must be considered in the future as well.
9. Vissers (Vissers, Hens, Hansen, & Taeymans, 2016) (Vissers, et. al., 2016)	PubMed, Cochrane, and PEDro were searched for studies with supervised diet, exercise or combination interventions and that objectively measured VAT using MRI/CT to determine effectiveness 13 articles matched the criteria	13 articles N=792 participants Age range = 7-19 years	-Systematic review and meta-analysis were written -Searched PubMed, Cochrane, and PEDro for supervised diet, exercise, or combination that used VAT as the measure of effectiveness -Pre-intervention and post-intervention data were used to analyze	-Combined exercise and diet interventions or exercise-only interventions resulted in significant decreases in VAT -No significant change in VAT in diet-only groups (**only one study's results – showed decrease in BMI) -Duration of interventions was from 3 months to 1 year and used aerobic exercise or combination exercise	This study's meta-analysis shows the effectiveness of exercise-only and exercise-diet combination interventions to be effective in reducing VAT significantly. However, the only diet-only study showed no significant change in VAT but did show a significant change in BMI in the participants. When using weight as a measurement of effectiveness though, it is critical to remember that children are expected to gain weight during growth periods. The authors also go on to admit that SAD (sagittal abdominal diameter) may be a better measure of effective weight loss than VAT in women with obesity, but more research must be done before this is applied to children.

<p>10. Golan (Golan & Crow, 2004)</p>	<p>This is a meta-analysis of different research that has already been conducted.</p>			<ul style="list-style-type: none"> -Parental nutritional knowledge was positively associated with fruit and vegetable consumption and negatively with total energy and fat intake -Children’s food preferences are formed from repetition in early childhood -Availability and accessibility accounted for 35% of the variability in juice, fruits and vegetables consumption in elementary school girls but not elementary school boys -Association of eating habits between children and parents habits -Efforts by adults to limit children eating outside the home are limited by earlier access to money by children -Family meal time also plays a role and these children tend to have improved dietary quality -Preschoolers are more likely to eat a food if they see their parent modeling the food -Parents who consume more fruits and vegetables have daughters who consume more fruits and vegetables (However, other studies shown low family resemblance in food preference and attitude -Parent activity improved the predicted of obese children’s activity levels (more highly correlated with girls) 	<p>Healthcare providers have told parents they should rely on trust rather than control when it comes to feeding their child – the parent supplies the food and a supportive environment while the child decides when and how much to eat. When implementing interventions for obese children, the interventions should be health-focused rather than weight-focused. Parents also should be considered the key players and central agents of change in the prevention and treatment of obesity. It is also important for the family to be aware of genetic, environmental, and familial influences on their child’s weight as well as what factors are contributing to their child’s weight. Parents should be authoritative in regulating the type of food they serve to the child, setting appropriate limits for their child, and acting as a model for healthy behaviors. Parents should also foster an environment of positive self-esteem.</p>
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				<ul style="list-style-type: none"> -Pressure in child feeding was negatively associated with fruit and vegetable intake -Parental control may interact with genetic predispositions 	
<p>11. Golan (Golan & Crow, 2012)</p>	<p>50 out of 60 children who had previously participated in the original study</p> <p>7 years later</p>	<p>N=50 (aged 14-19 years)</p>	<ul style="list-style-type: none"> -Children were randomly assigned to parent-only group or child-only group (matched for sex and age) -Parent-only group: encouraged parents to practice authoritative parenting and 1-hour group sessions -Child-only group: 1500 kcal diet and a 1-hour group sessions -Weight and height measured 1, 2, and 7 years after the program's end 	<ul style="list-style-type: none"> -Child in parent-only have a significantly higher weight loss than the child-only group -35% in the parent-only group reached non-obese status -14% in the child-only group reached non-obese status -No significant difference by gender -1-year follow-up: children in parent-only was statistically significant compared to child-only -2-year follow-up: reduction in overweight participants was 15% in parent-only and 2.9% in child-only -Both groups showed large weight losses in 7 years (29% in parent-only and 20.9% in child-only) -After 7 years, 60% in parent-only group were not obese with 31% in the child-only -Time and gender were significant after 7 years with boys more overweight than girls 	<p>These studies reveal statistically significant weight loss as well as maintenance of non-obese status in parent-only obesity treatment groups. This could indicate that a change in parenting practice could be preventative or a treatment for pediatric obesity. The parenting style changing from controlling to authoritative might be a large contributing factor in reducing obesity in children as well. In this study, the parents were the authoritative source for the children but also acted as role models during their child's treatment. Using parents as the source of authority for treating childhood obesity is also supported widely by other research. Also, there was less resistance by the child when the parent-only group was used compared to the child-only group.</p>

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