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A Scoping Review: Family and Child Perspectives of Clinic-Based Obesity Treatment

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Abstract

Problem: Interventions for children with obesity lead to only modest improvements in BMI and long-term outcomes, and data are limited on the perspectives of families of children with obesity in clinic-based treatment. This scoping review seeks to answer the question: What is known about the perspectives of families and children who receive care in clinic-based child obesity treatment?

Eligibility Criteria: Studies were eligible for inclusion in this review that 1) reported parent, family or child perspectives of obesity treatment; 2) addressed concepts identified in the obesity literature as barriers or facilitators to success in obesity treatment from the perspective of the parent/family/child, including reasons for failure to return to clinic and satisfaction with care.

Sample: Twelve studies qualified for final inclusion in this scoping review.

Results: Families report a lack of interventions tailored to their unique needs and resources. Barriers and facilitators encompass 1) structural issues (e.g., clinic location and scheduling); 2) financial issues; 3) patient and family issues; and 4) personal behaviors, motivation, and expectations.

Conclusion: Data are lacking on the clinic-based treatment of children with severe obesity, and few studies report on non-maternal perspectives.

Implications: Clinical practice must be tailored to individual family needs. Future research should concentrate on identifying missing variables which impact successful treatment outcomes through more rigorous qualitative studies, standardized outcome measures, focus on children with severe obesity, and fathers' and siblings' perspectives.

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Declaration of Conflicting Interests

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Keywords

childhood obesity; clinic-based treatment; scoping review; child perspective; parental perspective

Childhood obesity is a complex chronic disease affecting families with increasing prevalence both in the United States (U.S.) and globally. Currently, 18.5% of U.S. children ages 2 to 19 years are obese (Hales, et al., 2017; Skinner, et al., 2018). Obesity disproportionately affects children of lower socioeconomic status and minority status (Hales et al., 2017; Lee, et al., 2014; Skinner et al., 2018). The economic cost of childhood obesity is high: Total projected direct medical costs over the lifetime for the current number of 10-year-olds with obesity is approximately $14 billion above projected medical costs for their healthy weight peers (Finkelstein, et al., 2014).

Childhood obesity treatment strategies include a focus on nutrition, physical activity and behavior change (Janicke et al., 2014; Katzmarzyk et al., 2014). Reviews of obesity intervention trials report minimal body mass index (BMI) improvement and results of interventions provide little data or understanding of why outcomes are poor and short-lived (Peirson et al., 2015; van Hoek, et al., 2014). There is an increasing awareness that successful childhood obesity treatment must be directed at the family and identify and understand how genetic and prenatal risks, mental health issues, and the social determinants of health (e.g., living environment, education, resources) may impact the success of behavior change interventions (Al-Khudairy et al., 2017).

Childhood obesity care is varied, ranging from individualized patient and family care provided by a multidisciplinary team at episodic visits, to participation in structured group programs with pre-determined content and visit frequency (Al-Khudairy et al., 2017; Oude Luttikhuis et al., 2009). Family perspectives for those seeking care for their child with obesity in individualized, clinic-based treatment settings may differ from those attending program-based interventions. Additionally, the treatment structure may impact clinician's ability to identify and address barriers to behavior change. Clinic-based treatment for this review is defined as care provided in an outpatient or tertiary care clinic with at least one primary care provider: Medical Doctor (MD), an Advanced Practice Registered Nurse (APRN), or a Registered Dietician (RD). The primary goal of the clinic is to treat children diagnosed with obesity and who are either experiencing or are at risk for obesity-related comorbidities.

There is a dearth of data describing the perspectives of families in individualized, clinic-based obesity treatment or in program-based obesity treatment. Past studies focus on reasons for attendance/nonattendance, barriers/facilitators to program adherence, and satisfaction with program components (Kelleher, et al., 2013). Program-based obesity treatment, in contrast to clinic-based obesity treatment, is typically more intensive (i.e., meeting more than once per week), delivered over a short period of time (i.e., over 3– 6 months), and has a defined start and stop time (Golley, et al., 2007; Janicke et al., 2014; Taveras et al., 2017). Though these interventions may include a clinic visit, the typical design includes group meetings, social work visits, nutrition classes and an exercise component.

Children referred to clinic-based obesity treatment are at the highest risk of and/or already exhibit signs of cardiometabolic sequelae related to their weight (i.e., hypertension, insulin resistance, and hyperlipidemia) (Chung, et al., 2018; Freedman, et al., 2007). Describing and understanding the perspectives of families with children in clinic-based obesity treatment will inform research and practice and potentially improve outcomes for children with obesity. Family for this review will be defined to include any parent, caretaker, or sibling, whether in the child's home (nuclear) or outside of the home (extended).

This review aims to explore the scope of perspectives reported by families of children with obesity who have received individualized outpatient clinic-based obesity treatment. Specifically, we aim to answer the following question: What is known about the perspectives of families and children who receive care in clinic-based child obesity treatment?

Methods

Scoping Review

A scoping review was conducted using the framework described by Arksey and O'Malley (2005). The framework employs an iterative process to comprehensively identify and review relevant literature, identify key concepts, and identify gaps in existing research. We employed Arksey and O'Malley's (2005) five-step process for scoping reviews: a) identification of the research question; b) identification of relevant studies; c) study selection; d) charting the data; and e) collating, summarizing and reporting the results.

Identification of Relevant Studies

A systematic search was conducted by the first author, who consulted a research librarian for help in identifying search terms, in February 2018 to identify relevant studies in the following databases: PubMed, CINAHL, Scopus, PsycINFO, Cochrane Reviews, and Embase. It resulted in 2,011 records. There were no date limits placed on the search. Searches were database-specific, as follows. PubMed: ("Health Care Evaluation Mechanisms"[MeSH Terms] AND ("pediatric obesity"[MeSH Terms] OR ("pediatric"[All Fields] AND "obesity"[All Fields]) OR "pediatric obesity"[All Fields])) AND "Parents" [MeSH Terms]; (("pediatric obesity"[MeSH Terms] OR ("pediatric"[All Fields] AND "obesity"[All Fields]) OR "pediatric obesity"[All Fields]) AND "Parents"[MeSH Terms]) AND "Weight Reduction Programs"[MeSH Terms]; CINHAL: parents AND (pediatric obesity or child obesity) AND (treatment or intervention or therapy) AND (experiences or perceptions or attitudes or views). Scopus: parent* and child obesity* and experience and intervention. PsycINFO: ((SU.exact("PARENTS PARENTING") OR ORG.exact("PARENTS") OR SU.exact("PARENTS") OR SU.exact("PARENTING") OR ORG.exact("PARENTING")) AND SU.exact("PEDIATRIC OBESITY")). Cochrane Reviews: family and experiences and children and obesity treatment programs. Embase: parent and childhood obesity and intervention study. An ancestral search of reference lists from seminal papers resulted in 26 additional records. To ensure no recent studies were missed, an updated search with date limits of 2017–2019 was conducted in January 2019. This search found no additional studies.

Study Selection

Articles were identified, screened, and selected for further review in three stages by the first author: titles and citations, abstracts, and full text or article. Figure 1 details study selection and exclusion criteria at each stage in the process. Studies were included if investigators reported parent, family, or child perspectives on clinic-based obesity treatment, and addressed concepts identified in obesity literature as barriers or facilitators to success in obesity treatment from the parent/family/child perspective, including reasons for failure to return to clinic and satisfaction with care. There was no age limit placed on the child involved in treatment. Studies were excluded if they were not in English, did not focus on families and children in clinic-based obesity treatment, did not evaluate treatment from the family and child perspectives, and did not identify concepts related to barriers and facilitators to treatment. Twelve articles qualified for final inclusion in this scoping review.

Charting the Data

Data tables facilitated analysis. Participant characteristics across studies are summarized in Table 1: sample size; child age, sex, BMI-related measures and comorbidities; adult/other participant relationship to the child; and race/ethnicity of participants. The study design, providers and setting, measures, and results are presented in Table 2.

A summative content analysis (SCA) approach was used to identify key concepts during the collating and summarizing of the data from the studies by the first author (Hsieh & Shannon, 2005). In SCA the key words/concepts are derived from both the interest of the researcher and review of pertinent literature (Hsieh & Shannon, 2005). The concepts of barriers and facilitators were identified during the review process as salient as they impact adherence, attrition and outcomes of interventions. Barriers and facilitators to treatment outcomes were synthesized into the following categories by the authors after analyzing data reported in each study: 1) structural; 2) financial; 3) patient and family; and 4) personal behaviors, motivation and expectations. Tables 3 and 4 report study concepts identified to be barriers and facilitators to treatment, respectively.

Collating, Summarizing and Reporting the Results

Participant Characteristics

Parents or caregivers were sampled in the majority of studies (Table 1) (Barlow & Ohlemeyer, 2006; Campbell, et al., 2011; Hampl et al., 2013; Sallinen Gaffka et al., 2013; Stewart, et al., 2008). Five studies provided parent and child perspectives (Banks, et al., 2014; Bishop, et al., 2015; Owen, et al., 2009; Rhodes et al., 2017; Skelton, et al., 2016), five studies provided parent only perspectives (Barlow & Ohlemeyer, 2006; Campbell et al., 2011; Hampl et al., 2013; Sallinen Gaffka et al., 2013; Stewart et al., 2008), and two studies provided child only perspectives (Murtagh et al., 2006; Sousa et al., 2017). Bishop, et al., (2015) also sampled siblings of children in treatment.

Ages of children included in studies ranged from 1–20 years old (Table 1). Parent/caregiver participants were mainly mothers (Banks et al., 2014; Bishop et al., 2015; Campbell et al., 2011; Hampl et al., 2013; Owen et al., 2009; Sallinen Gaffka et al., 2013; Skelton et al.,

2016; Stewart et al., 2008), with no data provided on the characteristics of parents or caregivers in three studies (Barlow & Ohlemeyer, 2006; Murtagh et al., 2006; Sousa et al., 2017). Sampling also included a caregiver other than a parent (i.e., grandparent or 'other') (Banks et al., 2014; Campbell et al., 2011; Owen et al., 2009; Stewart et al., 2008) and a sibling (Bishop et al., 2015). In all studies but one (Murtagh et al., 2006), the majority of children with obesity were female; however, Bishop et al., (2015) and colleagues did not describe the sex of participant. In the seven studies describing race/ethnicity, most participants were white or non-Hispanic white (Barlow & Ohlemeyer, 2006; Bishop et al., 2015; Campbell et al., 2011; Rhodes et al., 2017; Skelton et al., 2016), followed by Black (Hampl et al., 2013; Sallinen Gaffka et al., 2013).

BMI of children in treatment was reported in 10 studies (Table 1) (Banks et al., 2014; Barlow & Ohlemeyer, 2006; Bishop et al., 2015; Campbell et al., 2011; Hampl et al., 2013; Murtagh et al., 2006; Rhodes et al., 2017; Sallinen Gaffka et al., 2013; Skelton et al., 2016; Sousa et al., 2017). Investigators used a variety of BMI references and interpretations to report BMI. These included BMI percentile based on the CDC and/or WHO growth references (Banks et al., 2014; Campbell et al., 2011; Sallinen Gaffka et al., 2013), BMI percentile along with BMI z-score (Hampl et al., 2013; Rhodes et al., 2017; Sousa et al., 2017), only BMI z-score (Barlow & Ohlemeyer, 2006; Murtagh et al., 2006), the mean and raw BMI score and BMI z-score (Skelton et al., 2016), and the mean and raw BMI score in addition to percentile (Bishop et al., 2015). The range of BMI percentiles, BMI z-scores, and raw BMI scores reported across studies were 97.32–99.6; 2.06–3.09, and 34–37.8 respectively. No measure of BMI was reported in two studies (Owen et al., 2009; Stewart et al., 2008).

Data describing comorbidities of children were identified in four studies (Table 1) (Barlow & Ohlemeyer, 2006; Bishop et al., 2015; Campbell et al., 2011; Skelton et al., 2016) but comorbidities were only detailed in two studies. Barlow and Ohlemeyer (2006) identified and detailed the following comorbidities: acanthosis nigricans; elevated cholesterol; systolic and diastolic blood pressure great than 95th percentile for age, gender, and height; sleep apnea; elevated fasting insulin and serum alanine aminotransferase; polycystic ovarian syndrome; and tibia vara. Campbell et al. (2011) identified and detailed the following comorbidities: insulin resistance (acanthosis nigricans, hyperinsulinemia, or both); cardiovascular conditions (elevated blood pressure, hyperlipidemia, or both); some sleep disturbance (snoring, obstructive sleep apnea, or both); underlying respiratory conditions (asthma, exercise intolerance, or both); and other comorbid conditions such as reflux, fatty liver disease, or slipped capital femoral epiphysis. Bishop et al., (2015) and Skelton et al., (2016) only stated that inclusion into their study was one comorbidity related to the child's obesity but did not identify or detail conditions.

Study Characteristics

Studies included were a mix of qualitative (Banks et al., 2014; Bishop et al., 2015; Murtagh et al., 2006; Owen et al., 2009; Sallinen Gaffka et al., 2013; Skelton et al., 2016; Stewart et al., 2008), quantitative (Rhodes et al., 2017; Sousa et al., 2017), and mixed methods (Barlow & Ohlemeyer, 2006; Campbell et al., 2011; Hampl et al., 2013) (Table 2). Seven studies

were conducted in the United States (Barlow & Ohlemeyer, 2006; Bishop et al., 2015; Campbell et al., 2011; Hampl et al., 2013; Rhodes et al., 2017; Sallinen Gaffka et al., 2013; Skelton et al., 2016), three in England (Banks et al., 2014; Murtagh et al., 2006; Owen et al., 2009), and one each in Scotland (Stewart et al., 2008) and Portugal (Sousa et al., 2017). Eleven of the studies were conducted in tertiary care clinics in large urban settings (Banks et al., 2014; Barlow & Ohlemeyer, 2006; Bishop et al., 2015; Campbell et al., 2011; Hampl et al., 2013; Owen et al., 2009; Rhodes et al., 2017; Sallinen Gaffka et al., 2013; Skelton et al., 2016; Sousa et al., 2017; Stewart et al., 2008), and one was conducted in a community-based clinic (Murtagh et al., 2006).

All children were seen in outpatient clinics for treatment, but the provider delivering the care varied. Provider specialty was reported in nine studies. Five clinics included a MD, RD, and a psychologist or behavioral health counselor as part of multidisciplinary care (Barlow & Ohlemeyer, 2006; Bishop et al., 2015; Campbell et al., 2011; Sallinen Gaffka et al., 2013; Skelton et al., 2016). In addition to a MD, RD and psychologist, two of the clinics also provided a physical therapist (PT) or exercise specialist (ES) (Owen et al., 2009; Sousa et al., 2017). Three clinics were staffed by a MD, RD, and PT or ES (Hampl et al., 2013; Murtagh et al., 2006; Rhodes et al., 2017). One clinic had a medical provider (APRN or MD) and a RD (Banks et al., 2014). One clinic had a lone provider who was a RD (Stewart et al., 2008). None of the clinics reported having nursing as a component of their models of care, with the exception of an APRN as a provider in one study (Banks et al., 2014).

Barriers and Facilitators to Treatment

Barriers: *Structural*—Structural barriers, as defined by the authors of this review, refer to any component affecting the care delivered at the clinic, and include: clinic location; accessibility to the treatment site; clinic hours and scheduling; lack of sensitivity for cultural differences; content and acceptability of the intervention; and the demeanor of clinicians who deliver the intervention. The most common structural barriers reported were dissatisfaction with the program content itself or the expressed concern that the clinic did not meet expectations in terms of service delivery (Banks et al., 2014; Barlow & Ohlemeyer, 2006; Hampl et al., 2013; Owen et al., 2009; Sallinen Gaffka et al., 2013), location of clinic and the distance to travel or problems with transportation (Barlow & Ohlemeyer, 2006; Bishop et al., 2015; Hampl et al., 2013; Sallinen Gaffka et al., 2013), scheduling conflicts (e.g., inconvenient clinic hours competing with work and school) (Barlow & Ohlemeyer, 2006; Hampl et al., 2013; Sallinen Gaffka et al., 2013), length of visits (e.g., too long or short) and visit frequency (e.g., too often or too infrequent) (Barlow & Ohlemeyer, 2006; Bishop et al., 2015; Sallinen Gaffka et al., 2013), negative experiences with providers (Murtagh et al., 2006; Owen et al., 2009; Stewart et al., 2008), and the lack of psychological support (Banks et al., 2014; Owen et al., 2009). Barriers specific to clinic recommendations were unrealistic food guidelines described by children (Murtagh et al., 2006), lack of specific diet advice including structured meal plans and recipes (Banks et al., 2014; Owen et al., 2009), and the program not offering rewards (Hampl et al., 2013).

Barriers: *Financial and patient and family*—Financial barriers identified were either no insurance coverage or services needing to be paid for out of pocket (Barlow &

Ohlemeyer, 2006; Hampl et al., 2013; Sallinen Gaffka et al., 2013), excessive costs related to exercise advice (e.g., costs for sports or gym memberships) (Banks et al., 2014; Owen et al., 2009; Sallinen Gaffka et al., 2013), parents missing work to attend visits (Bishop et al., 2015; Skelton et al., 2016), and cost to purchase healthy food (Campbell et al., 2011; Owen et al., 2009). Barriers identified related to patient and family were children missing school and parents balancing work and other demands (Banks et al., 2014; Barlow & Ohlemeyer, 2006; Bishop et al., 2015; Campbell et al., 2011), parents feeling guilty in restricting their child's food intake (Owen et al., 2009), and the behavior change efforts being undermined by the other parent or other family members (Stewart et al., 2008)

Barriers: *Personal behaviors, motivation and expectations*—Barriers identified related to personal behaviors, motivation, and expectations specific to children were: children not being involved in the decision to attend treatment or not being ready to make behavior changes (Banks et al., 2014; Barlow & Ohlemeyer, 2006); child self-report of low self-esteem and low self-confidence (Murtagh et al., 2006); and low self-efficacy (Owen et al., 2009). Parents described their personal motivation as a barrier to success for their children (Barlow & Ohlemeyer, 2006; Bishop et al., 2015; Owen et al., 2009). Parents reported the lack of motivation to make recommended changes in their or their child's diet (Campbell et al., 2011; Hampl et al., 2013) and parents were not ready to make necessary lifestyle changes for themselves or their child and family (Barlow & Ohlemeyer, 2006). Parents confirmed inherent difficulties in making dietary changes as well as changing eating behaviors like eating less and eating slower (Bishop et al., 2015). Parents also identified difficulties in adhering to the program specifics (Sousa et al., 2017) and either did not implement specific changes or could not identify ways they might change their lifestyle long-term (Owen et al., 2009). Mismatched parental expectations and clinic expectations were also barriers (Banks et al., 2014; Barlow & Ohlemeyer, 2006; Hampl et al., 2013).

Facilitators: *Structural*—Structural facilitators were sometimes the direct opposite of the barriers identified. For example, specific meal plans, additional clinic locations, more frequent appointments, and financial support for parking and transportation costs were all described as helpful. Participants in 7 studies reported the following themes as facilitators to success: a) tailoring advice regarding diet and exercise for the individual child and family; b) taking into account the child's age/development and the parents' ability to accommodate recommendations; c) and giving detailed plans to follow by providers (who are seen as possessing knowledge and expertise) (Banks et al., 2014; Bishop et al., 2015; Campbell et al., 2011; Owen et al., 2009; Rhodes et al., 2017; Sallinen Gaffka et al., 2013; Skelton et al., 2016). Participants desired more frequent appointments (Owen et al., 2009; Sallinen Gaffka et al., 2013) and the application of motivational techniques and continual support by providers even after treatment was complete (Campbell et al., 2011; Murtagh et al., 2006; Owen et al., 2009; Sousa et al., 2017; Stewart et al., 2008). Participants suggested group support and/or classes where children and/or families could interact would help facilitate success (Sallinen Gaffka et al., 2013; Skelton et al., 2016). Families wanted providers to be more supportive and relaxed as well as more culturally sensitive (Owen et al., 2009; Sallinen Gaffka et al., 2013) and would have liked an orientation to the clinic and general information prior to starting treatment (Skelton et al., 2016). Parents reported that having some type of

reward during treatment would also be beneficial but were not specific on what that reward would be (Sallinen Gaffka et al., 2013). Finally, families wanted additional or extended clinic hours along with additional locations closer to where families lived (Skelton et al., 2016).

Facilitators: *Financial and patient and family*—Facilitators related to finances were providing financial assistance with both transportation and parking (Sallinen Gaffka et al., 2013; Skelton et al., 2016), and assistance and resources related to exercise recommendations (i.e., gym memberships) (Skelton et al., 2016). The most common facilitators to success related to patient and family were increased family cohesion and connectedness (Bishop et al., 2015; Rhodes et al., 2017; Skelton et al., 2016; Sousa et al., 2017; Stewart et al., 2008), and support — unconditional and ongoing — of the whole family (i.e., significant other, nuclear family and extended family) (Campbell et al., 2011; Murtagh et al., 2006; Rhodes et al., 2017; Stewart et al., 2008). Participants also valued having an additional voice outside of the family to give legitimacy to the family role in new behaviors (Banks et al., 2014).

Facilitators: *Personal behaviors, motivation and expectations*—Facilitators related to personal behaviors for the child were: the increase in the child's self-esteem and self-efficacy from seeing weight loss; autonomy and support in making healthy choices; making behavior changes in exercise and diet (Bishop et al., 2015; Campbell et al., 2011; Murtagh et al., 2006; Stewart et al., 2008); and adherence to specific program recommendations related to physical activity and dietary changes by children and families (Owen et al., 2009; Skelton et al., 2016; Sousa et al., 2017). Facilitators important for setting expectations and staying motivated were: having children actively involved in the decision to attend treatment (Banks et al., 2014), goal setting for realistic weight loss that also reflected specific numeric goals and at a more rapid pace (Rhodes et al., 2017; Skelton et al., 2016), and the child reporting a desire to fit in socially (Murtagh et al., 2006).

Discussion

Our review of the literature identified 12 studies evaluating family and child perspectives to clinic-based obesity treatment. This is the first scoping review to present what is known about the perspectives of families and children who receive care in clinic-based child obesity treatment. Participants across studies were primarily mothers. Families reported experiencing a lack of tailored recommendations in the treatment setting which reflected their individual family needs and available resources. Barriers and facilitators to success reported by families were often the direct opposite of one another.

Perspective of Families and Children in Treatment

Maternal perspectives dominated the data throughout this review, and though children in treatment were included in some of the studies, child-only perspectives were limited and how they differed from parental perspectives was not clearly reported in the studies. Data from fathers is also minimal, as is data from siblings or other family members in the household. Understanding the perspectives of other family members (e.g., fathers, siblings,

etc.) is important to pursue as best practice recommendations for treatment of children with obesity is targeted at comprehensive behavioral family lifestyle interventions (Janicke et al., 2014; Whitlock, et al., 2010). Successful treatment requires family-wide support, participation, and lifestyle change over time (Anderson, 2018; Katzmarzyk et al., 2014), therefore consideration of how families perceive treatment recommendation and function on a daily basis is essential. Fathers and mothers often differ in their parenting styles, involvement, and opinions about lifestyle behaviors for multiple reasons (e.g., parental work schedules, cultural expectations, gender norms related to parental roles and responsibilities, views on how family finances are used, etc.) (Allport et al., 2018; Wysocki & Gavin, 2006). Studies examining paternal involvement in children with other chronic illnesses support the association between greater paternal involvement and more favorable treatment adherence and quality of life among children (Wysocki & Gavin, 2006). Investigating how fathers influence health behaviors in the home and/or support treatment recommendations for children has been identified as an important area for future study (Allport et al., 2018). Fathers' perspectives are salient to understanding how to best tailor lifestyle change treatment recommendations to families' available physical and psychosocial resources, as compliance with treatment recommendations may be facilitated through increased paternal engagement in family lifestyle behavior change.

Barriers and Facilitators: Structural

Structural barriers identified in clinic settings were similar to barriers to interventions for obesity delivered in other treatment settings (i.e., programs and community-based interventions) (Cason-Wilkerson, et al., 2015). Structural barriers included both facility-related issues (location, distance, visit frequency) and dissatisfaction with the program itself and with providers (advice not as expected, low levels of provider support). Providing a way to access support from providers between visits is something that has been identified in non-clinic settings as a facilitator to success (Grow et al., 2013; Jensen et al., 2014; Lyles et al., 2012). A barrier identified across several studies is that families struggled with understanding and implementing diet and physical activity recommendations which they considered too general. Tailoring of interventions needs to consider individual family's financial resources, family and patient logistics, and interpersonal dynamics. Implementing a process for pre-visit orientation to the clinic may help to assess and clarify parent/child expectations, motivations and behaviors.

Barriers and Facilitators: Financial

Financial barriers identified included cost to implement dietary and exercise recommendations, as well as costs related to transportation and parking. Other studies have noted that families have reported struggling to afford making recommended changes to diet and exercise given during program-based interventions as well (Cason-Wilkerson et al., 2015). Providing families with specific resources families they can access that are free or low-cost and available in their community or online for both food and exercise options may reduce financial barriers and facilitate success. Optional free access to an exercise specialist (ES) may increase motivation and adherence to physical activity. An ES can evaluate the child's current fitness and create a specific home exercise program which matches child/

family interest and resources along with periodic scheduled fitness testing to monitor progress.

Barriers and Facilitators: Patient and Family

Families reported time constraints due to work, school and other obligations which impact the energy and time families and children can devote to making lifestyle changes. Time constraints can influence parental availability to shop for and prepare healthy meals, participate in physical activity and attend clinic appointments (Cason-Wilkerson et al., 2015). The presence of unsupportive nuclear or extended family members was a consistent barrier. Undermining the efforts of the child and caregiver in charge of seeing that treatment guidelines are followed is a theme also found in the literature in community-based and program childhood obesity interventions (Cason-Wilkerson et al., 2015; Grow et al., 2013; Rhee et al., 2016). Studies in our review reported that not supporting the need for the child to be in treatment and not removing all unhealthy food from the home and/or allowing other family members to consume unhealthy food in front of the child are barriers to successful outcomes (Campbell et al., 2011; Stewart et al., 2008). It is important to explore tactics that better include family members not present at the visit.

Barriers and Facilitators: Expectations, Motivation, and Behaviors

A theme noted by both parents and children was the program was ‘not what we were looking for’ (Barlow & Ohlemeyer, 2006; Hampl et al., 2013). The concept of expectations is closely related to patient and family satisfaction. Previous research has demonstrated significant correlation between parent/child expectations of treatment and satisfaction (Alm et al., 2008; Skelton & Beech, 2011). Clarifying treatment expectations with all stakeholders (i.e., parents, child, family and provider) may help raise parent and child satisfaction.

Satisfaction is also closely tied to parent and child motivation to make lifestyle changes. Motivational Interviewing is a nascent research domain being applied with some success with parents and children with obesity as an adjunct to treatment (Bean et al., 2018; Borrello, et al., 2015). If an older child does not have a good understanding of how their weight affects their overall health and is not motivated to improve their health, it is likely to be a significant barrier to success (Jensen et al., 2014; Sallinen et al., 2013). Parents who fail to comprehend the serious sequelae their child is at risk for, either present or imminent, may be unmotivated to make changes in the home environment. Children may be less motivated if they are not involved in the initial decision to engage in treatment.

Gaps

Gaps identified in this review were related to the paucity of data from children themselves and family members other than the mother, specifically fathers’ and siblings’ perspectives, and lack of consistent BMI-related measures identifying children with severe obesity. This gap in family member perspectives, particularly fathers, has been identified previously in both practice and research for children with chronic conditions (Wysocki & Gavin, 2006). Data describing how the child in treatment, fathers, siblings and other family members perceive treatment recommendations for children with obesity are lacking and should be further explored.

BMI-related measures to evaluate a child's weight varied making comparing the results across studies difficult. Additionally, the variance in BMI-related measures created challenges with accurately identifying children with severe obesity. The now accepted approach of defining obesity severity according to body mass index (BMI) percent of the 95th BMI percentile for age and sex (BMIp95), with BMIp95 ≥120% defining severe obesity,(Kelly 2013) was not applied to any of the studies reviewed. Achieving clinically significant weight loss with lifestyle modification alone is low in children with severe obesity; therefore, this subpopulation is important identify and target both in research and clinically (Danielsson, et al., 2012).

Limitations

Though care was taken to systematically search multiple databases and a research librarian was consulted for help with search terms, it is possible that pertinent studies have been missed. Consistent with scoping methodology, this review did not assess the quality of included studies, therefore it is difficult to determine if particular studies provide robust findings (Arksey & O'Malley, 2005). Comparing participant results across studies was limited due to the differing study designs. BMI-related measures to evaluate child weight outcomes was missing from several studies and when reported varied in the measure used which prevented comparing results across studies and the identification of children with severe obesity. Agreement on a common measure to identify and track children with obesity both clinically and in research is needed, particularly for those youth with severe obesity. Although some studies included the parent and child perspectives, the results did not discuss if parent and child perspectives were divergent or convergent which limited understanding whose perspective was being reported.

Recommendations for Research

Concepts warranting further research identified in this study are attrition, adherence, obesity related quality of life, motivation of the child themselves both individually and in the context of the family, self-efficacy and confidence, and parental and child communication as it relates to motivation and encouragement of children to reach their goals.

Further qualitative research is needed to provide context and understanding of why children with obesity and their families currently in treatment reported barriers and facilitators to successful outcomes identified in the quantitative arena. Qualitative research may uncover concepts, variables, and barriers and/or facilitators not yet identified. Replicating well-designed qualitative studies in various age groups and ethnic minority populations may provide needed insight to inform current interventions and explore novel interventions.

Research is needed on children diagnosed with severe obesity. Severe obesity is the fastest growing subcategory for both children and adolescents; 6% of all US youth have severe obesity (Skinner et al., 2018). Treatment approaches to children with severe obesity differ from those of children with moderate obesity and often include medication and referrals for bariatric surgery (Kelly et al., 2013). The experiences and perspectives of children with severe obesity and their families are important to investigate as they may have different needs than children with moderate levels of obesity.

Clinical Recommendations

Careful assessment of patient/family motivation and expectations of treatment prior to beginning treatment may increase engagement and adherence to treatment recommendations. While medical providers and parents may prioritize health and sequelae of obesity rather than weight status, children (particularly adolescents) describe their motivation for seeking treatment as largely to lose weight and be more socially accepted (Murtagh et al., 2006; Sallinen Gaffka et al., 2013; Skelton et al., 2016; Sousa et al., 2017). Therefore, providers and parents need to consider developmentally appropriate care when engaging the child in treatment, setting goals and providing ongoing support.

Clinical care must accommodate individual family need. Families report needing specific diet and exercise recommendations that are tailored to their individual family structures, schedules and available resources. General recommendations regarding diet and exercise, though providing content, are not sufficient and may prove overwhelming to families. Tailoring interventions to the specific child and family by ensuring providers consider available financial resources, child and parental time constraints, and developmental stage of both child and family is crucial when making recommendations in the clinical setting (Barlow & Ohlemeyer, 2006; Bishop et al., 2015; Hampl et al., 2013; Owen et al., 2009; Sallinen Gaffka et al., 2013; Skelton et al., 2016). Assessing individual family preferences to provide specific plans, such as detailed shopping lists, meal plans and recipes, and exercise regimens to follow on a day to day basis, may give some concrete actions to follow and help facilitate lifestyle changes.

Technology adjuncts should be further explored and evaluated as a means to tailor interventions and increase provider support between clinic visits. Increasing support by providers between visits was identified as a potential facilitator of success in this review (Hampl et al., 2013; Owen et al., 2009; Skelton et al., 2016). Sharing this responsibility among the various disciplines may reduce provider workload, and engaging nursing in this domain could allow providers to focus on the medical needs of the children and families.

Group care for children with obesity and their families is worth considering. The Centering® Model of Group Healthcare is an evidence-based model of group health care that effectively addresses the complex social determinants of health and has been used to deliver prenatal care, well infant care, and care for chronic conditions (Centering® Healthcare Institue, 2019). The Centering® model has been shown to be effective in delivering care and improving outcomes particularly in high risk groups (Trotman et al., 2015). It would be beneficial to see if structuring visits for children with obesity and their families using a centering model would help to address some of the barriers to success identified in this review by building into clinic visits additional provider and peer support, community building, and interactive learning for families. Obstacles to implementing this model are language, culture and difficulties with reimbursement.

Implications for Nursing

Specialized obesity care is scarce for children and often falls on the primary care provider who may or may not have the knowledge and expertise to manage the complexities of

obesity. Creative approaches to multidisciplinary care, which includes engaging nursing in care delivery and coordination, may address this limitation in current practice. Family systems nursing directs care at the family unit and focuses on the interaction among family members in caring for a particular family member with an illness (Wright & Leahey, 1990). Utilizing a family nursing approach in the care of families of children with obesity may increase access to care and resources for children who need additional support and services.

Conclusions

This scoping review was the first to examine the perspectives of families of children with obesity in clinic-based treatment. Mothers' perspectives dominated the data and data from children in treatment or other family members were sparse. Ability to categorize responses according to obesity severity was limited. Future research should concentrate on identifying missing variables which impact successful treatment outcomes through more rigorous qualitative studies, standardized outcome measures, and focus on children with severe obesity.

Clinical practice recommendations which may improve adherence to treatment and weight-based outcomes include assessing expectations and motivations prior to treatment; providing tailored recommendations considering individual family needs, structures, schedules and available resources; and strategically designed technology applications as an adjunct to treatment and group care. Identifying ways for clinics to utilize nursing in their care model may help narrow barriers identified and facilitate successful outcomes. Our review highlighted the need for more robust family-centered practice, and research which will identify and explore factors impacting adherence to treatment recommendations, thereby improving weight-related outcomes for children with obesity and their families.

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Highlights

- Research on children with severe obesity, their perspectives, experiences, and treatment is needed.
- Family perspectives were dominated by mothers and the child. Perspectives of fathers and/or siblings were lacking.
- Barriers and facilitators to treatment include financial/structural, family issues, behaviors, and motivations/expectations.

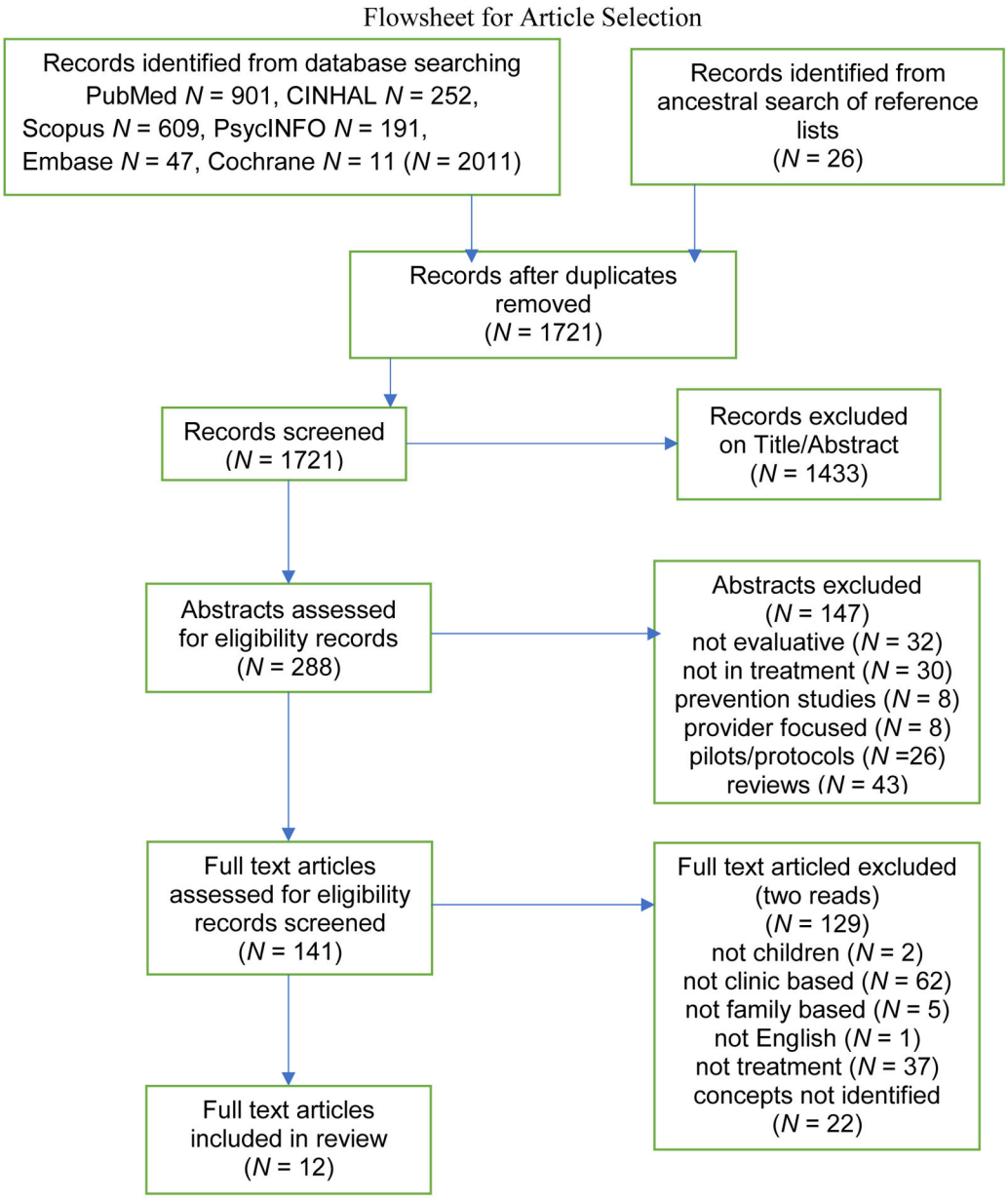

Figure 1.
Flowsheet for article selection

Table 1

Summary of Participant Characteristics

First author, year, country	Sample Size (*N*)	Child Age range (years)	Child Mean Age (years)	Child Sex (*N*)	Child BMI and Comorbidities	Parent/Family	Race/Ethnicity
Banks, et al., 2014 UK	32 Families	5–16	NDR	M = 13 F = 20	≥ 98th centile Patient excluded if not managed by PCP = NDR	[1]Mo = 21 Mo/C =8 Fa/C = 1 GP/C = 1 Mo/Fa = 3	NDR
Barlow, et al., 2006 US	43 Families	1– 17	11.9	M = 14 F = 29	z-score mean/SD 2.52/ ± .39 30 patients had a comorbidity (69.8%)	NDR	*Child* [2]W = 28; 65.2% AA = 13; 30.2% O = 2; 4.7%
Bishop, et. al., 2015 US	23 Families	7 and older	NDR	NDR	X = 37.8 ± 7.98 X > 99th percentile At least one weight related comorbidity	C = 23 Mo = 21 Fa = 4 Sibling = 4	*All Participants (Parents and Child)* W = 50% AA = 32% BR = 14% H = 5%
Campbell, et al., 2011 US	193 Parents	3–17	11.3	F = 105 M = 88	X = 99.1th percentileSD ± 1.03 At least one weight related comorbidity • Insulin resistance- 78.4% • Cardiovascular conditions −57.8% • Sleep disturbances – 42.7% Two comorbidities- 15% • Three- 16.8% • Four or more- 56.2% Multiple comorbidities- 88%	Mo = 83.9% Fa =9.3% Other = 6.7%	*Parents* Non-H= 105; 54% W = 71, 37% AA = 34, 18% H = 67, 37% W = 61, 32% AA = 6, 3% O = 25, 13%
Hampl, et al., 2013 US	147 Parents	2–18	10.8	M = 58 F = 82 Missing = 7	Percentile X = 99.2 SD ± 1.9 z-score X = 2.4 SD ± 0.5	Mo = 87%	*Child* W = 52; 34.7% B = 53, 36.1% O = 12, 8.2% Missing = 22, 14.9%
Murtagh, et al., 2006 UK	20 Children	8–14	NDR	Children M = 14 F = 6	z-score X ± 3.09 SD 0.49	NDR	NDR
Owen, et al., 2009 UK	32 P = 21 C = 11	7–18	NDR	F = 6 M = 5	NDR	Mo = 17 Fa = 4 GP = 1	NDR

First author, year, country	Sample Size (*N*)	Child Age range (years)	Child Mean Age (years)	Child Sex (*N*)	Child BMI and Comorbidities	Parent/Family	Race/Ethnicity
Rhodes, et al., 2017 US	405 P = 405 C = 160	2–18	11.7 (3.6)	F= 246 M = 160	Percentile X = 98.6 SD ± 3.1 z-score X ± 2.43 SD 0.47 NDR	P = 405 C = 160	*Families* H = 6, 15.6% W non-H = 185, 45.7% B non-H = 92, 22.7% A non-H = 4, 1% O = 16, 4% Missing = 45, 11.1%
Sallinen Gaffka, et al., 2013 US	147 Parents	2–18	10.8 (3.3)	F = 56% M = 44%	Percentile X = 99.2 SD ± 1.9 NDR	Mo = 87%	*Parents* B = 36% W = 35% H = 6% O = 8% Missing = 15%
Skelton, et al., 2016 US	87 Parent/child dyads	7–18	11.8 (2.51)	C = 30 F = 65%	BMI X = 34 SD ± 8.35 z-score X = 2.36 SD ± 0.355 At least one weight related	P = 57 F = 93%	*Child* H = 1% Non-H AA = 40% Non-h W = 54% A = 1% AI = 1% O = 3% *Parent* H = 2.4% Non-H AA = 38.8% Non-h W = 57.7% A = 1% AI = 1% O = 3%
Sousa, et al., 2017 Portugal	94 Children	12–18	14.17 (1.51)	F = 48 M = 46	Percentile X = 97.32 SD ± 2.193 z-score X = 2.065 SD ± 0.377 NDR	NDR	NDR
Stewart, et al., 2008 UK	17 Parents	5–11	NDR	F = 9 M = 8	NDR	Mo = 14 Fa = 2 GP = 1	NDR

BMI= Body Mass Index

NDR = No data reported

M = Male F= Female

[1]Mo= mother, C = child, Fa = Father, P = parent, GP = grandparent

[2]W = White, H = Hispanic, AA = African American, O = other, BR = biracial, Non-H = Non-Hispanic, Non-W = Non-white, A = Asian, AI = American Indian

Table 2

Study Design, Measures, and Results

First author, year country	Design	Setting and Providers	Study Measures	Results
Banks, et al., 2014 UK	Qualitative	One tertiary care clinic or two primary care - based obesity clinics in Bristol, England Primary clinics[1] APRN, RD Tertiary clinic MD, RD	**Parents and Children Report** * Semi-structured interviews • Parents of children interviewed together who attended at least 3 appointments and provided final outcome measures during 12-month treatment Number of questions= NDR Topics: • clinic expectations • experience of clinic and practitioner advice • lifestyle and diet changes made after advice • practical aspects of clinic elements missing from clinic	Main factors that promote or discourage engagement with obesity services • Building engagement • Maintaining engagement • Disengaging
Barlow et al., 2006 US	Mixed methods	Tertiary care clinic in St. Louis, MO MD, RD, Psych	**Parent Report** 9 item questionnaire developed by PI completed via mail or phone Validity/Reliability= NDR Topics • Lack of insurance coverage • Scheduling conflicts • Dissatisfaction with frequency of visits • Distance from home • Concerns about missed school • Lack of readiness to make lifestyle changes • This program is not what we are looking for	Parent reasons for nonreturn • Program did not meet expectations 37.2%, $N = 16$ • Child would miss too much school 27.9%, $N = 12$ • Too far from home 23.3%, $N = 10$ • Scheduling conflicts 20.9%, $N = 9$ • Insurance does not cover obesity care 20.9%, $N = 9$ • Child is not ready to make changes 16.3%, $N = 7$ • Visits are not frequent enough 11.6%, $N = 5$ • Visits are too frequent 7.0%, $N = 3$ • Family is not ready to make changes 4.7%, $N = 2$ • Return for a 3rd visit was associated with the highest BMI quartile (z-score > 2.9) $p = 0.02$ – OR =3.6 for return of those in highest BMI quartile (CI = 1.1–11.6, 95th%), $p = 0.01$

First author, year country	Design	Setting and Providers	Study Measures	Results
				• White families more likely to report the program was too far $p = 0.02$ and program did not meet expectations $p = 0.03$ • Two parent families more likely to report program did not meet expectations $p = 0.02$
Bishop, et. al., 2015 US	Qualitative	Tertiary care clinic MD, RD, Psych, PT	**Parent and Child Report** Semi-structured interviews Active in treatment families conducted in person: • Parent and child interviewed separately Inactive in treatment via phone Questions covered 4 domains • Family and child experience • Family behavior changes • Family participation • Challenges	Themes • Family perceptions and attitudes toward program • Barriers to family participation • Reasons for attrition • Family preferences for addressing health behaviors
Campbell, et al., 2011 US	Mixed methods Cross-sectional retrospective study	Tertiary care clinic in Orlando, FL MD, RD, Psych	**Parent Report** 30 item questionnaire combination of Likert type questions and qualitative short answer to explore perception of Importance, Readiness, and Confidence to effect change in 4 lifestyle domains Likert scale 1–5 1 = NOT, important, ready, concerned or confident 5 = VERY important, ready, concerned, confident • General questions about child's weight • Eating habits • Physical activity habits • Next steps Validity/Reliability: NDR	• Level of concern and importance of child's weight rated as "high"77.1% with a "5"; $M = 4.7$; $SD = 0.7$ • Importance: to change eating- 78% with a "5" $M = 4.7$; • $SD = 0.7$ • Importance: to change physical activity-76.6% with a "5" • $M = 4.7$; $SD = 0.8$ • Readiness: to change child's eating 80.5% with a "5"; $M = 4.8$; $SD = 0.7$ • Readiness: to change child's physical activity 69.8% with a "5"; $M = 4.6$; $SD = 0.8$ • Confidence: to change eating overall 50.7% with a "5"; $M = 4.1$; $SD = 1.1$ • Confidence: to change physical activity overall 53.7% with a "5"; $M = 4.3$; $SD = 1.0$ Ready to change eating habits: • χ^2 [1, $N = 193$] = 12.399; $p < .001$ – Confident group - 94.2%; $N = 104$ – Not confident group - 75.3%; $N = 89$ Ready to change physical activity habits:

First author, year country	Design	Setting and Providers	Study Measures	Results
				• χ^2 [1, *N* = 193] = 21.577; *p* < .001 – Confident - 87.3%; *N*= 110 – Not confident group - 56.6%; *N* = 83
Hampl, et al., 2013 US	Mixed methods Nonexperimental descriptive study Qualitative data-not reported	Tertiary care clinics-provided 56% of data Programs-44% Multisite study- 13 participating sites from Children's Hospital Association in US Providers-NDR	**Parent Report** Author developed semi structured survey measuring 48 factors which may contribute to attrition in 10 domains using 3-point Likert scale of how influential in the decision to leave (1= no/low influence, 2 = moderate influence, 3 = high influence; also, options of 'don't know' and 'not applicable') Validity/ reliability = NDR Domains • Transportation • Program characteristics • Scheduling • Finances • Barriers to implementation • Mismatch of expectations • Communication with providers • Parent physical/emotional health • Child physical/emotional health • Motivation	Domains as having moderate to high influence on attrition in order of importance • Scheduling- 59.8%, *N* = 88 • Implementation barriers-53.7%, *N* = 79 • Transportation problems-51.7%, *N* = 76 • Motivation-39.4%, *N* = 58 • Mismatched expectations-36.8%, *N* = 54 • Child physical/emotional health-34.7%, *N* = 51 • Parent physical/emotional health-34%, *N* = 50 • Finances-33.4%, *N* = 49 • Program characteristics-32.7%, *N* = 48 • Communication-30.6%, *N* = 45 Mismatched expectations having a moderate or high influence on the decision not to return • Private insurance: 62.5% vs all other insurance 33.3%, *p* = .003 • Race/ethnicity: White 64.1% vs Non-White 36.7%, *p* = .008 • Program or clinic type: clinic 52.5% vs program 32.7%, *p* = .04 • Rewards for participation: rewards not offered 60.9% vs offered 22.2%, *p* < .0001 Patients referred from a physician had a moderate/high influence on their decision not to return compared to self-referrals * 63.4% vs 42.4%, *p* = .03 Clinic patients indicated finances had a moderate/high influence on their decision not to return * 51/5% vs 29/8%, *p* = .005
Murtagh, et al., 2006 UK	Qualitative	Community based clinics sponsored by National Health Service in Leeds, England Providers- NDR	**Child report** • Open ended questions individual interviews and 3 focus groups (6–8 children) • Number of questions = NDR	Themes • Reasons to change: • Cues for action • Barriers to action

First author, year country	Design	Setting and Providers	Study Measures	Results
			Topics • When they first became aware of their weight problem • What instigated the process of behavior change? • The presence of barriers to behavioral change • Whether attempts to lose weight had been made previously • Why they felt the need to lose weight • What helps them lose weight • What makes it difficult to lose weight	• Continued compliance • Barriers to compliance
Owen, et al., 2009 UK	Qualitative	Tertiary care clinic in Bristol, England MD, RD, ES	**Parent and Child Report** In-depth in person semi-structured interviews with parent and child separately Interview guide: Parent/Child • Questions about child referral • Descriptions and feelings about appointments • Suggestions for improvement • Reasons for on attendance Parent only questions • Clinic accessibility • Thoughts on hospital setting Compared themes between unsuccessful/did not attend (DNA) and successful families • Successful reduction in BMI in SDS = 0.69 • DNA -attended one or more appointment but no follow-up	Themes • Role of the clinic-successful families • Role of clinic-unsuccessful families • Approach used by the provider team- successful and unsuccessful • Advice given and changes made by families in relation to diet- successful • Advice given and changes made by families in relation to diet- unsuccessful • Advice given and changes made by families in relation to exercise- successful • Advice given and changes made by families in relation to exercise- unsuccessful
Rhodes, et al., 2017 US	Quantitative Prospective, nonrandomized, uncontrolled single arm pilot trial	Tertiary care clinic and Programs Multisite study- 12 sites from Children's Hospital	**Parent and Child Report** Paper survey developed by authors in 4 main categories baseline "What do you want?' and follow-up "What do you need?" 3 months ± 2 weeks in person on paper if possible, if not follow-up then via mail or phone	• Overall attrition rate = 42.2% • More discordant parent/adolescent treatment expectations the higher the odds of attrition at 3 months (for one-unit difference on the Likert scale OR 1.36, 95% CI 1.04–1.78, p = 0.02)

First author, year country	Design	Setting and Providers	Study Measures	Results
		Association, in US Providers-NDR	• Healthier food/drinks • Physical activity/exercise • Family support/behavior • Weight management goals Items were based on acquiring knowledge, behavioral skills, and role of family support Cronbach's α ≥ 0.8 in all subcategories of the too internal consistencyParents (Cronbach's αs .08 – .96) adolescents (Cronbach's αs .08 – .92)Concordance of parent/adolescent expectations = difference between parent and adolescent dyad survey responses in each category	• Adolescents showing greater interest in getting families involved in healthy eating and exercise decreased odds of attrition (for one-unit difference on the Likert scale OR 0.75, 95% CI 0.57–0.98, $p = 0.04$) • Compared to dropouts' adolescents who did not drop out greater desire for help at baseline to get family "onboard" with Healthy eating changes (2.44 vs 1.83, $p = .02$) Physically Active (2.48 vs 1.80, $p = .01$) • Attrition was associated with adolescent weight-loss goals above the desired median for the group (50% above the median vs. 28% below the median, $p = 0.02$)
Sallinen Gaffka, et al., 2013 US	Qualitative	Tertiary care clinics and programs Multisite −13 sites with National Association of Children's Hospitals MD, RD, Psych	**Parent Report** Semi structured phone interview developed by 2 of the authors Designed to assess for parent perspectives about what programs/clinics could do to increase retention included 3 open ended questions	Most common themes to reduce attrition • Components of the program: 23% though they may be general tailor treatment options to each child/family • Logistical: 21% of parents reported extended or weekend hours and more accessible locations • Treatment delivery: 19% no consistent responses as some desired individual while others desired group care that was grouped by age • Financial assistance with transportation, exercise and/or rewards:18%
Skelton, et al., 2016 US	• Qualitative	Tertiary care clinic North Carolina, US MD, RD, Psych, PT, ES	**Parent and Child Report** • Semi-structured phone interviews developed by authors using tenets of patient-centered care • Pilot tested interviews via cognitive interviewing • Reviewed for face validity by expert clinicians	• Attrition rate: 63%; reasons given were lack of weight loss, desire for more structured in treatment and lack of adolescent-specific program • Children who dropped out had higher BMI z-scores by • t-test (2.45 vs. 2.21, $p < 0.01$) Main themes • Overall positive experience with the program • Logistical challenges of participation • Improved health • Discrepancies between child and parent experience and perception • Importance of structure and expectations of weight loss

First author, year country	Design	Setting and Providers	Study Measures	Results
Sousa, et al., 2017 Portugal	Quantitative Cross-sectional correlation study	Tertiary care clinic in Portugal MD, RD, ES	**Child Report** • Adherence to Weight Control Questionnaire- AWCQ- measures Treatment Adherence to Weight Control-29 items with four subscales: SEA (Self-efficacy and Adherence Behaviors); PPI (Parental and Provider Influence): FSI (Friends and School Influence) and PB (Perceived Benefits) (reliability 0.908) and Risk of Non-Adherence to Weight Control- 7 items (reliability 0.770) • Impact of Weight on Quality of Life-IWQOL self-report instrument 27 items, 4 factors (physical comfort, body esteem, social life, family relations) (Internal consistency 0.73–0.93/ total scale 0.934) • Clinical files for demographic, anthropometric, and behavioral variables (weekly physical activity, screen time, previous treatment length).	• Larger the self-efficacy/adherence behavior index, the higher the body esteem (r = 0.282, $p < 0.01$) and obesity-related quality of life index (r = 0.275, p < 0.01). • Influence of parents and providers on adherence to weight control is associated to an increasing rate of physical comfort ($r_s = 0.253$, P < 0.05); social life (r = 0.237, • $p < 0.05$); family relations (r = 0.326, $p < 0.01$); and obesity-related quality of life index (r = 0.236, $p < 0.05$) • Overall higher indices of adherence to weight control are associated to several higher indices of IWQOL (coefficients between 0.225 and 0.289, $p < 0.05$) • Obesity-related quality of life scores (IWQOL) • (range 1–100) 79.795 (*SD* = 18.972) • Subscales – Family relations 93.81 (*SD* = 16.365) – Social Life 83.154 (*SD* = 22.013) – Physical comfort 82.491 (*SD* = 20.959) – Body Esteem 66.357 (*SD* = 28.036)
Stewart, et al., 2008 UK	Qualitative	Tertiary care clinics- 2; in Scotland RD	**Parent Report** In-depth interviews- no data on how the interview guide was developed	• 7 children of parents interviewed met their treatment goal of reduction in BMI Themes identified • Aware parents- of child's weight problem – Seekers those aware parents seeking help – Avoiders parents unable or unwilling to discuss concerns • Unaware parents- described their child's weight as normal for age – Deniers- parents who did not see a problem • During treatment: – Need for support from both nuclear and extended family – Extended family less supportive and often sabotaged efforts – Parents felt the need to justify lifestyle changes to family

First author, year country	Design	Setting and Providers	Study Measures	Results
				• Post treatment – Need for continued support after formal treatment completed – Noted improvement in child's self-esteem and confidence – Parents did not prioritize weight loss at the end of treatment

*Bold faced font indicates who is providing the data

1APRN = Advanced Practice Registered Nurse, RD = Registered Dietician, FC = Family counselor, Psych = psychologist or counselor, PT = Physical therapist, ES = Exercise specialist

Table 3

Barriers to Treatment

First author, year country	Structural	Financial	Patient and Family	Personal Behaviors, Motivation, and Expectations
Banks, et al., 2014 UK	**Disengaging* • Clinic did not meet expectations in terms of services • Expected medical or pharmacy approach • No psychological practitioner which was desired by parents • Clinic was not age appropriate in their approach • Did not provide structured meal planning	*Disengaging* • Structured plan for exercise was too expensive to implement	*Building Engagement* • Children not involved in decision to attend *Disengaging* • Stigma of missing school for clinic visits particularly with adolescents among peers	*Building Engagement* • Family expectations did not match experience
Barlow et al., 2006 US	• Dissatisfaction with the program • Distance/too far • Scheduling conflicts • Visits not frequent enough • Visits too frequent • Distance from home • Scheduling conflicts • Dissatisfaction with visit frequency	• Insurance not covering obesity care • Lack of insurance	• Concerns about missing too much school	• Readiness to make changes • Family not ready to make change • Child not ready to make changes • Program not what expected
Bishop, et. al., 2015 US	*Barriers to family participation* • Time commitment for visit was great *Reason for attrition* • Distance to clinic • Finding reliable transportation	*Barriers to family participation and Reason for attrition* • Parental work schedule, i.e., shift work	*Barriers to family participation* • Scheduling conflicts due to siblings' activities and parents work obligations	*Barriers to family participation* • Inherent difficulties of diet changes • Difficulty changing eating behaviors, i.e., how fast and how much
Campbell, et al., 2011 US	NDR	• Financial concerns to buy healthy food	• Hectic schedule of child and difficulty balancing demands • Parent work schedule creates difficulty in making healthy	• Reported lack of motivation • Worry of social stigma (child and family) of

First author, year country	Structural	Financial	Patient and Family	Personal Behaviors, Motivation, and Expectations
			choices and monitoring child's food and activity	obesity as an obstacle to making change (being seen exercising)
Hampl, et al., 2013 US	• Scheduling • Transportation problems, distance to clinic • Mismatched expectations between family and clinic • Program recommendations were overwhelming to families and unrealistic given their resources • Program recommendations were too general • Communication between visits was not sufficient for families	• Program costs • Lack of insurance • Insurance did not cover obesity care • Cost of transportation	• Implementation barriers-recommendations were not practical and took too much time • Child physical/emotional health, children were stressed by program requirements • Parent physical/emotional health	• Parent/family motivation • Mismatched expectations between parent, child and clinic
Murtagh, et al., 2006 UK	*Barriers to action* • Negative experiences with dieting and dietitians • Unrealistic strict food guidelines	*Barriers to compliance* • Expensive 'healthy' foods • Expensive sports activities	*Barriers to action* • Blaming parents for not addressing their weight problem sooner	*Barriers to action* • Difficulty making lifestyle changes needed *Barriers to compliance* • Low self esteem • Low self confidence • Perceived that barriers were beyond their control (actions of peers, voices of authority, physical inability, access to sports facilities and place of residence) • Wanted weight loss to be faster as they wanted more immediate results
Owen, et al., 2009 UK	*Role of the clinic* • Expected clinic and staff to keep child in control (low self-efficacy) • Did not see RD or PT at first appointment	*Dietary advice received, and changes made by families* • Lack of resources to follow advice *Exercise advice received, and changes made by families*	Dietary advice received, and changes made by families • Parental guilt with restricting diets feared they were damaging their child psychologically	*Dietary advice received, and changes made by families* • Did not implement any specific changes *Exercise advice received, and changes made by families*

First author, year country	Structural	Financial	Patient and Family	Personal Behaviors, Motivation, and Expectations
	• Wanted psychological support to help with parenting issues and child's emotional needs *Dietary advice received, and changes made by families* • Parents wanted more specific diet advice, plans and recipes Approach used by the team • Provider was too harsh	• Exercise advice was impractical due to expense of exercise facilities or lack of facilities	*Exercise advice received, and changes made by families* • Felt the exercise requirements/ time were impractical and they already did adequate exercise	• Unable identify ways to change their lifestyle long term
Rhodes, et al., 2017 US	NDR	NDR	• Disagreement on the importance of familial involvement between adolescent and parent	• Unrealistic weight loss goals which can predict attrition rates
Sallinen Gaffka, et al., 2013 US	• Scheduling not flexible • Location-distance to travel • Unmet expectations • Too much information at first visit	• Exercise resources offered by clinic were expensive • Cost of treatment was prohibitive, or insurance did not cover • Transportation costs • Cost of healthy foods	NDR	NDR
Skelton, et al., 2016 US	• Time commitment for the program was to intensive • Clinic hours were not flexible • Clinic was too far	• Missed work time by parents	• Stress in the family apart from the treatment • Difficult for the whole family to participate • Missed school time for child	• Dissatisfied with the program, i.e., they did not lose weight, more treatment structure, lack of adolescent -specific program
Sousa, et al., 2017 Portugal	• Not assessing motivation • Not considering obesity related quality of life • Lack of provider support	NDR	• Lack of parental involvement and support	• Non-adherence to program specifics
Stewart, et al., 2008 UK	• Negative experience with the providers	NDR	Problems with the parent's significant other • Offering children junk food • Undermining the parent who initiated lifestyle changes	NDR

First author, year country	Structural	Financial	Patient and Family	Personal Behaviors, Motivation, and Expectations
			• Extended family and friends not supportive and actively undermining healthy behaviors- particularly grandparents	

* Italicized text are themes identified in the study results

Table 4

Facilitators to Treatment

First author, year country	Structural	Financial	Patient and Family	Personal Behaviors, Motivation, and Expectations
Banks, et al., 2014 UK	**Maintaining engagement* • One on one specialty advice given based on knowledge, experience and personal circumstances of children and families • Tailoring exercise advice to the child's age, gender, social environment and interests and parents' ability to accommodate the recommendations	NDR	*Maintaining engagement* • Parents valued having another voice (clinic) to lend legitimacy to the family role around diet and exercise	*Building engagement* • Child was involved in the decision to attend
Bishop, et. al., 2015 US	*Family preferences for addressing health behaviors* • Examples of exercise options	NDR	*Family preferences for addressing health behaviors* • Clear roles and responsibilities for food provider and preparer • Mores structure at home *Family perceptions and attitudes toward treatment program* • Increased family cohesion due to program recommendations	*Family preferences for addressing health behaviors* • Autonomy for children to choose among healthy options in food and exercise
Campbell, et al., 2011 US	• Motivational interviewing techniques • Clinic partnering with child and family to work through child resistance to treatment • Targeted goal setting with detailed plan • Unconditional support of care providers	NDR	• Unconditional support of the whole family	• Seeing weight loss will be motivating to continue to make healthy choices • Assistance to help improving self-esteem of child
Murtagh, et al., 2006 UK	*Continued compliance* • Continual support and motivation by providers to remain motivated	NDR	*Cues for action* • External influence of role model to change behavior, typically intervention by their mother *Continued compliance* • Continual support and motivation by family to remain motivated	*Reasons to change* • Bullying • Desire to fit in • Health and physical ability Continued compliance by • Increased self-efficacy

First author, year country	Structural	Financial	Patient and Family	Personal Behaviors, Motivation, and Expectations
Owen, et al., 2009 UK	*Role of the clinic* • Ongoing support by clinic by keeping families mindful of weight as an issue and motivated • Children preferred hearing advice from a professional • More frequent appointments *Approach used by the team* • Supportive and relaxed provider *Dietary advice received, and changes made by families* • Structured advice given about diet *Exercise advice received, and changes made by families* • Motivational PT	NDR	NDR	*Dietary advice received, and changes made by families* • Motivated by weight loss • Families made changes in diet based on advice *Exercise advice received, and changes made by families* • Increased exercise intensity
Rhodes, et al., 2017 US	• Tailoring treatment to meet family needs based on initial expectations and realistic goals	NDR	• Having entire family on board with eating healthier and being physically active	• Setting realistic goals for weight loss
Sallinen Gaffka, et al., 2013 US	• More tailored treatments • Offer more information in advance so participants know what to expect • Group activities • Rewards • Increase staff and cultural sensitivity • Parent encouragement • More interaction with staff and family • More frequent appointments	• Transportation assistance • Exercise resource assistance • Financial assistance	NDR	
Skelton, et al., 2016 US	• Staff support and “having someone to talk to” about weight/health • Classes/group support • Holistic/multidisciplinary approach • Extended clinic hours • Orientation to clinic and information PRIOR to starting	• Assistance with transportation • Assistance with parking	• Children valued the increased family time in meal planning, goal setting and family meals (NEW INSIGHT) • Improved health behaviors • Improved confidence	• Specific guidelines on meal plans and goal setting • Specific guidelines on how to lose weight more rapidly

First author, year country	Structural	Financial	Patient and Family	Personal Behaviors, Motivation, and Expectations
	• Specific weight loss goals • Specific guidelines for behavior change • Additional locations in the communities • Adolescent-specific content			
Sousa, et al., 2017 Portugal	• Assess and consider obesity related quality of life • Assess motivation • Sustained provider support and influence	• NDR	• Parental involvement and support • Strong family relationships	• Adherence to lifestyle change and treatment program • Personal motivation by adolescent
Stewart, et al., 2008 UK	• Continued support from providers once ‘treatment’ was complete	• NDR	Support needed from significant other • Actively reinforcing agreed lifestyle changes • Supporting the decision to seek treatment • Support from extended family.	• Increased self-esteem through the knowledge gained at the clinic

*Italicized text are themes identified in the study results