

**Pediatric Weight Management: Provider Needs Assessment to Improve Care for Military  
Dependents**

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**Author Note**

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### **Abstract**

**Background/Purpose:** The prevalence of overweight and obesity in the pediatric population is a global epidemic. Rapid weight gain in early childhood exacerbates risk factors for obesity, chronic disease in adulthood, and disqualifies 31% of American youth from serving in the Armed Forces. Although the pediatric dependents weight crisis reflects the national dilemma, there are inconsistencies in provider knowledge, limited access to evidence-based, weight management intervention, and treatment options. This paper will assess provider needs, identify opportunity to improve practice, and process used in weight management in the clinic.

**Method:** Eight military and four civilian pediatric and family practice providers completed a 16-item needs assessment survey. The survey was distributed via email using an online survey tool, and a printed version was provided to those who had not completed it online. Data was collected over 8 weeks and a descriptive analysis of content was done using the Intellectus software.

**Results:** Although the response rate was 88.9%, it was lower than anticipated due to COVID-19 related military deployments. Descriptive data were obtained on a variety of provider needs and practices. Results provided valuable information on current attitudes of providers. Providers demonstrated a significant need for a multidisciplinary support team including a dietician and more time dedicated to weight management at office visits. At least 50% of providers have had motivational interviewing training and report that they apply these techniques as part of an intervention in patient's weight management care.

**Implication:** Data supports overweight and obesity care practice changes in the clinic. Areas identified by providers included the need for further training and clinic management support including the availability of a pediatric dietician added to the healthcare team.

**Keywords:** primary care provider, pediatric, overweight and obesity management, military child

### **Improving Military Pediatric Weight Management**

Military medical facilities care for active duty members and their dependents. This includes more than 2.4 million pediatric beneficiaries in the United States (US) and abroad (Department of Defense [DOD], 2016). The prevalence of obesity among the military pediatric population parallels that of their civilian counterparts. The most common reason young adults are ineligible for military service is due to excess weight. This inability to serve has a direct impact on military recruitment and, therefore, national security..

#### **Problem Statement**

High body mass index (BMI) in children and adolescents is currently at an all-time high. Being overweight or obese implies there is an excessive amount of fat accumulation on the body that can present long-term health risk (The Center for Disease Control and Prevention [CDC], 2019). The CDC (2019) Pediatric Growth Chart and BMI is gender and age specific in children and is used as the de facto overweight and obesity assessment measurement for children ages 2 to 20 years. BMI is calculated by dividing the body weight in kilograms by height in meters squared. A BMI-for-age of greater than or equal to the 95<sup>th</sup> percentile is considered obese and greater than or equal to the 85<sup>th</sup> percentile to less than the 95<sup>th</sup> is considered overweight (CDC, 2019).

Excess weight in children and adolescents has become a public health crisis. Matei and Bareille (2018) noted that obesity in children and adolescence has increased worldwide and is considered a global public health epidemic. In 2015, The National Health and Nutrition Examination Survey (NHANES) found that the issue overweight and obesity rate in adolescents has steadily increased over the past 15 years and childhood obesity has been found to be disproportionately prevalent in ethnic and racial minority populations (Zylke & Bauchner, 2016).

The prevalence of obesity among our 12-19 year-old in the US was 20.6% in 2015–2016, and 18.4% in children 6–11 years (Hales et al., 2017). Currently, 30% of adolescent military dependents are overweight (BMI greater than the 85<sup>th</sup> to less than the 95<sup>th</sup> percentile), and 15-17% are obese (greater than or equal to the 95<sup>th</sup> percentile) (Koehlmoos et al., 2020)). Obesity disqualified 31% of American youth from serving in the Armed Forces, and one in four young adults are too obese to serve in the U.S military (Maxey and Goodman, 2018). Although the military pediatric population is a reflection of the national obesity crisis, there are inconsistencies in care and decreased access to evidence-based weight management resources, treatment protocols and family-centered interventions in military clinics. The Department of Defense (DOD) spends over \$1 billion each year on obesity-related issues for active duty service members and their families (CDC, 2020).

Since our military personnel and their families represents a segment of the US society on a smaller scale, they often face similar health and healthcare challenges. Pediatric dependents and their families who receive healthcare at military treatment facilities faces similar weight management-related health crises. The problem is often compounded by parental denial that their child or adolescent is obese or overweight (Yackobovitch-Gavan et al., 2018). Healthcare providers in pediatric primary care face challenges in providing adequate care to these patients and families due to provider time restraints during clinic visits or availability of consistent, affordable coaching and nutritional resources that are financially covered by healthcare insurance provided to military families and their dependents (T. Simpson-medical director, personal communication, September 28, 2019).

### **Purpose and Rationale**

Children from military families are more likely to serve in the military as adults than their civilian counterparts. High rates of obesity within this population must be addressed to avoid negative impact in the number of eligible volunteers available for future military service. According to the Air Force Medicine fiscal year 2018 report, the Secretary of Defense submitted a detailed plan to improve pediatric care and related Military Health System (MHS) services for children and adolescent beneficiaries. This plan includes alignment of preventive health benefits such as weight management clinic referral to decrease comorbidities such as Type 2 Diabetes Mellitus (T2DM), which according the clinic's medical director, has increased in prevalence in the military pediatric population. The purposes of this Doctor of Nursing Practice (DNP) project are: to identify the gaps in the delivery of pediatric weight management recommendations; to examine provider needs and barriers to delivering weight management interventions; to assess provider knowledge of available resources; and to provide information in order to improve pediatric weight care management processes in the clinic.,

### **Significance**

Overweight or obese pediatric patients can have significantly negative long-term effects such as Type 2 diabetes mellitus, hypertension, coronary artery disease, depression, and fatty liver disease that may persist into adulthood (CDC, 2019). Recent data from 2015-2016 indicates an increase in overweight and obesity to 18.5% in children ages 2-19 years of age (CDC, 2019). According to Rodgers et al. (2018), research is vital to combatting the complex public health challenge of overweight and obesity on a national level. Agencies and organizations such as The National Institute of Health (NIH), and The Robert Wood Johnson Foundation (RWJF) have

invested in research to understand childhood obesity and develop prevention and treatment strategies (Rodgers et al., 2018).

### **Obese and Overweight Pediatric Management**

The CDC (2021) noted there were 12.7 million obese children and adolescents in the US. The cost to society will be over \$147 billion dollars annually and 1.1 trillion dollar over their lifetime if these children and adolescents remain obese in adulthood (Kasman et al., 2015). Over a third of US pediatric population are overweight or obese, while worldwide prevalence of children with BMI greater than or equal to the 85<sup>th</sup> percentile has significantly increased in less than 30 years (Lobstein et al., 2015).

The World Health Organization [WHO] (2016) noted that obesity among infant, children and adolescents has increased in many countries around the world. Therefore, one of the commission's set goals is to influence the implementation of government policies that prevent, identify and treat pediatric obesity to decrease the risk of morbidity and mortality. In addition, The United Nations (U.N.) in 2015 also established *The Sustainable Development Goal* that recognizes obesity as a concerning noncommunicable disease that has the potential to decrease life expectancy.

### **Body Mass Index Lowering Interventions**

Combined lifestyle interventions (CLIs) was noted by Van Rinsum et al. (2018) as successful at modifying and maintaining behavioral lifestyle changes and reducing overweight and obesity. However, Ball et al. (2017) noted that the motivation to make lifestyle changes should be assessed prior to interventions implementation. Currently, there is not an assessment tool available in the clinic to assess readiness to learn in families and youth that are overweight or obese. Recognizing this gap in information contributes to deciding if a motivational

interviewing intervention alone may be effective for a child or adolescent and their family. Standard of care during well visits across primary care facilities includes promoting a healthy low fat diet and 60 minutes of moderate to vigorous physical daily activity for all children and adolescents (CDC, 2019). The evidence has demonstrated that achieving long-lasting results with lifestyle modification once BMI is greater than or equal to the 85<sup>th</sup> percentile has been a challenge. Although, it is unusual for the health insurance, offered to the military and their dependents, will cover multiple visits with a dietician, Styne et al. (2017) noted that dieticians knowledgeable in dietary needs of growing children should be available to supervise calorie reduction and maintenance in overweight and obese patients between the ages of 2 and 19 years. Standardizing provider weight management practices, providing referrals to affordable, family-centered coaching programs, and implementation of behavioral modification techniques are all effective BMI reducing interventions (Fitzpatrick et al., 2016).

### **Current Practice**

The Center for Medicare & Medicaid Services (CMS) reimburses primary care practitioners and physicians for providing intensive behavioral therapy to adult obese patients, though reimbursement is contingent upon the patient losing 3 kilograms during the first six months of therapy. Although criteria for reimbursement by the CMS includes 22 visits of 10-15 minutes of initial and follow-up visits, Imoisili et al. (2018) noted that middle income patients were less likely to be scheduled for weight management follow-up visits. Often, reimbursement restrictions and primary care provider time-constraints limits intensive behavioral therapy implementation in clinic, though it has been noted to have strong supporting weight loss data (Fitzpatrick et al., 2016). In addition, implementation can be extremely challenging when providers have to prioritize clinic visits, often based on urgency of complaints.

**Desired Future Practice**

A systematic review of a meta-analysis done by Simmonds et al. (2015) noted that interventions to reduce BMI in adolescent obesity may reduce the chances of being obese as an adult and could have a significantly positive effect on maternal reproductive health. WHO (2016) also recommended government implemented policies that ensure equitable coverage of interventions especially for vulnerable population groups that have minimal access to healthy foods, preventative support services, and are at high risk of developing obesity. Consistency in obesity guideline application, implementation of government lead policies that support weight management services in all children and adolescents could make a significant impact in the current obesity crisis. The cost of obesity management may be time consuming and financial taxing to undertake. However, long-term benefits will reduce the cost of comorbidities associated with being overweight or obese over their lifetime.

**Internal Evidence and PICOT**

According to the medical director of a military pediatric clinic located in the southwestern US, obesity among military pediatric dependents parallel that of their civilian counterparts. The most common reason young adults are ineligible for military service is due to obesity, which may directly affect military recruitment and national security. Obesity accounts for 50% of juvenile hypertension patients in the clinic, and 40% of the adolescents were considered overweight. The medical director also noted that Type 1 Diabetes Mellitus (T1DM) was once the most common occurrence in children in the clinic. Currently, one third of the children and adolescents with diabetes have Type 2 Diabetes Mellitus. The problem of pediatric obesity management in a military clinic has led to the clinically relevant PICOT question: In providers caring for pediatric patients with BMI  $\geq$  85<sup>th</sup> percentile (P) will a need assessment (I) collected



over two months (T) adequately address barriers to care and willingness to change (O) compared to the status quo (C)?

### **Search Strategy**

An exhaustive database search of the literature was done in the Cumulative Index of Nursing and Allied Health (CINHAL), PubMed, and Cochrane database. Keywords used included: *childhood obesity, adolescents, pediatric, obesity, obese, education counseling, management, overweight, military child, military family, military beneficiary, guidelines, protocol-driven, intervention, improvement, family engagement, family-based, pediatrician, chronic conditions, high risk, healthcare provider, and primary care*. Searches yielded as initial 2,456 results. Terms were combined, limits were applied to published peer reviewed literature from the last 5 years and articles limited to the English language in order to narrow the total yield. Results were then hand searched based on title/abstract for any form of childhood and adolescent obesity or overweight protocol-driven management, guidelines or education counseling that are practiced by providers in the pediatric and family practice clinic setting. Pediatric population in the United States, between 2-18 years-old, were included with a focus on the military child. Underweight pediatric population and adult population were excluded, as not the intended population of research to critically appraise. This yielded 30 results in CINAHL, 32 results in PubMed, and six results in the Cochrane library. Further review for relevance and removing duplicates, yielded a remaining 31 articles. Additional filtering yielded 25 articles of which the reference lists were searched for additional applicable studies. A rapid critical appraisal was completed and 10 studies were selected for in depth evaluation. The articles included eight randomized controlled trials (RCTs), one retrospective study and one meta-

analysis. These studies were then organized into an evaluation table for further examination of themes (see Appendix A, Table A1).

### **Critical Appraisal and Synthesis of Evidence**

The level of evidence of the articles ranged from Level I to Level VI (see Appendix A, Table A1) with majority of the studies were of Level II evidence. Using the techniques recommended by Melnyck and Fineout- Overholt (2011), rapid critical appraisals were performed on all studies. It was determined that all studies had adequate sample sizes. The retrospective study (see Appendix A, Table A1) was considered biased according to Dickey et al. (2017) due to the inadequate coding allocation identified in the chart reviews. The meta-analysis had potential for bias during article selection (Yavuz et al., 2015). Overall, the primary outcome of the systematic review (SR) revealed that the included study length was insufficient to yield definitive results (see Appendix A, Table A1). Included RCTs and meta-analysis participants were not able to be blinded to study conditions according to Yavuz et al. (2015) due to the need for parental inclusion and disclosure related to minors. Although not explicitly discussed in all studies, an increased attrition rate was evident in the follow-up phase of majority of the studies.

The sample demographics detailed in the evaluated studies (see Appendix A, Table A1) exhibited a majority of females with a mean age range of 2-12 years, and the sample population inclusion criteria included an age range 2-17 years. However, there was a marked absence of adolescents in all studies. Self-efficacy and behavioral theories were inferred (see Appendix A, Table A1) throughout six studies. A conceptual framework was not explicitly stated for seven studies (see Appendix A, Table A1). The independent and dependent variables were clearly stated with homogenous primary outcomes.

Measurement instruments used were primarily anthropometric and provider self-reported questionnaires (see Appendix A, Table A1). RCT studies addressed body mass index as a dependent variable, and additional dependent variables consistent throughout studies included parent and provider needs, confidence and behavior change. Common interventions included cognitive behavioral therapy (CBT), motivational interviewing (MI), structured provider training, multidisciplinary team and support staff management approach (see Appendix A, Table A1). Data collection was measured using valid and reliable instruments. Level of significance (*P*), confidence interval (CI), variability variance, and standard deviation (SD) were reported in studies and effect size (ES) was reported in one study (see Appendix A, Table A1).

### **Summary of Evidence**

The evidence suggests that motivational interviewing (MI) by providers, structured provider training, and multidisciplinary and collaborative support may improve provider self-efficacy in caring for overweight and obese pediatric patients. Barriers to provider management consistency and parent compliance were shown to include, lack of readily available resources in the clinic setting, lack of provider educational training in weight management, lack of supportive services, provider frustration amid family poor adherence with referral, follow-up, and provider negative biases and attitude. There was a consensus among providers that they play an important role in pediatric weight management, though providers' confidence is lacking. Providers also believe that management should be a collaborative effort and not solely reliant on in-clinic visits.

Dickey et al. (2016) noted that military pediatric clinics experienced large dropout of patient participation in weight management studies due to time restraint in following through with the regimen required by the studies. Funding for availability of licensed multidisciplinary treatment clinics for obese and overweight children and adolescents were also a barrier and

although cost-effectiveness should be an integral part of these studies, Robertson et al. (2017) was the only study to address this variable. Rhee et al. (2018) noted that providers are not very knowledgeable in the availability of weight management resources in their communities. In addition, access to multidisciplinary teams and staff support for weight management are hampered by insurance restrictions (Rhee et al., 2018).

This literature review revealed that continuing education, collaborative support, and increased provider self-efficacy may be key to long-term weight management and adherence over time. Although the mean number of providers in each study was approximately 15 years, many providers were not adherent with weight management clinical guidelines. The outcomes also revealed that eHealth related interactive education with behavior modification, face-to-face training, online support groups and reliable support staff to provide frequent follow-up care, may be effective in achieving patient and family adherence to recommended weight management. These interventions improved self-efficacy in patients and providers.

### **Evidence-Based Practice Model**

Effective change in behavior requires an understanding of the environmental setting of the participant, the agent of change in position to influence the desired transformation and a recognition of what behaviors need to change. *Self-Efficacy Theory* is a theory postulated by Bandura (1997) as a theoretical explanation of individual's confidence in his or her ability to execute behaviors necessary to accomplish a task (Appendix B, Figure 1). Bandura (1997) also noted that self-efficacy and confidence work in conjunction. This implies that the more confident providers feel in their abilities to effect change in the family's adherence to treatment, the more likely they are to succeed in developing self-efficacy and confidence in their management of overweight and obese pediatric patients. Providers' self-efficacy in pediatric weight management

may improve confidence in delivering effective weight management support. Confidence in the provider's ability to educate their patients brings further successful and satisfactory results. Proper training can improve knowledge and proficiency and enhances providers' self-efficacy. Bandura's theory (1977) implies that a success in performing a task can enhance self-efficacy, while purported failure may diminish self-efficacy. This DNP project will use the theory as a guide to examining providers' self-efficacy in pediatric weight management as their self-efficacy may enhance a sense of competence in delivering robust pediatric weight management services to patients and their families.

### **Implementation Framework**

*The Centers for Disease Control and Prevention's (CDC) Framework* programs are used to guide program improvement and ensure program effectiveness (see Appendix B, Figure 2). Evaluation results can have a direct impact on how evaluation data are utilized. The objective is for evaluation recommendations and findings to inform future decision-making and lead to program improvement (CDC, 1999). During the preparation phase, the needs of the primary care pediatric clinic were assessed which, in this DNP project, led to the clinically relevant PICO question to search the literature for relevant evidence. *The CDC Framework* fits the characteristics of the project site and the identified problem. *The CDC Framework* focuses on evaluation of a site that provide a clear, methodical process for the evaluation that involved key stakeholders. The six-step, stakeholder-informed framework focused the evaluation on whether the current practice reflects the intended management outcome recommended by the United States Preventative Services Task Force (USPSTF) and the Department of Defense collaboration with CDC's division of Nutrition, Physical Activity, and obesity (DNPAO) focus on increasing opportunities to prevent and treat childhood obesity within the military community (CDC, 2019).

The model was applied in the initial stage of developing this DNP project by identifying and engaging the stakeholders in the process. Expected identifying stakeholders or change agents included the clinical medical director, pediatric healthcare providers, family practice providers, registered nurses, and medical assistants. The next step involved a description of the problem, the need for an evaluation focus designed to assess the providers' issues in obesity and overweight management, and to create a strategy that ensured that the developed need assessment was applicable and useful. The process then required a gathering of credible high quality external research evidence that has been shown to be effective in assessing the problem and provided the support for the development of a needs assessment survey. Findings from the needs assessment survey can be evaluated by connecting the results to the evidence gathered from the literature. Comparing the results to the providers' identified knowledge and perceived barriers to effective weight management will validate the results.

Additional phases of evaluation involve synthesizing evidence found and sharing lessons learned with stakeholders and their leadership. It includes obtaining an Institutional Review Board (IRB) approval (see Appendix C) for the implementation of a provider need assessment project, focusing on pediatric providers and their patients, then disseminating the results learned to those involved in the DNP project and to a wider audience of healthcare providers through presentation of results.

## **Methods**

### **Ethical Considerations**

Ethical consideration for this project included informed anonymity, voluntary participation of the providers in the survey, and the right to withdraw from participation at any time. Approval for the DNP project was granted by the Arizona State University Institutional

Review Board as a provider needs assessment project (See Appendix C). No personal identifying questions were asked; providers had the right of refusal to answer a question if they chose; and participation in the DNP project was not a requirement for employment. Any information obtained was kept confidential and no personally identifiable information was collected through the use of the survey. The Arizona State University (ASU) team had access to the data for analysis. The provider email list was kept private and confidential and stored in a password protect location at the project site. No provider email was linked to collected data.

**Sample**

Eligible participants (n=12) included English speaking male and female adult, military and civilian pediatric and family practice providers. Data were collected from a convenient sample of three pediatric medical doctors (MDs), two pediatric nurse practitioners, two physician assistants, two family practice MDs, and three family practice nurse practitioners that provide care to children and adolescents in a military clinic in Southwestern, Arizona.

**Procedure**

A brief 20-minute online invitation and survey was sent to each healthcare provider via email with a direct link to the online survey. In addition, printed copies of the survey were hand-delivered to those unable to complete survey online. Data collection occurred over an 8-week period. The 16-item Likert-style Questionnaire (see Appendix D) including 7 qualitative evaluation questions were used to assess provider self-efficacy, willingness to change current practices in obesity management, providers' perceived parent readiness to change behavior in addressing child's lifestyle and focused on asking question about opportunities to improve practice in managing childhood overweight and obesity in the clinic. The survey was evaluated by two pediatric primary care provider experts to ensure content validity. Providers were

reminded to complete the survey for three weeks in a row. Descriptive statistics were used to evaluate the results of the survey. The proposed budget for the project included printing survey, data collection and analysis tool were \$200 value but at no actual cost.

### **Results**

The Tables and Graphs (see Appendix E1-E5, Figure E1-E3) illustrates provider responses to questions on the needs assessment survey. Of the 12 providers sent an invitation to complete the survey, 9 attempted the survey and of those, 8 completed with a response rate of 88.89%.

The results of questions relating to provider training (Appendix E, Table E3) indicated that at least 54.6% of providers have had MI training. However, only 25% felt very confident in their ability to manage pediatric overweight and obesity (see Appendix E, Figure E1). In addition, 62.5% of providers overwhelmingly believe that at least 30 minutes per appointment is needed in order for providers to implement behavioral obesity interventions in clinic (see Appendix E, Table E3), and 58.3% of providers want a multidisciplinary support team and referral resources available in the clinic (see Appendix E, Table E2). There was a noted difference between the responses of the pediatric clinic providers who avoided weight discussion with parents “every once in a while or never” at 38%, compared to the 25% of family practice clinic providers who reported avoiding the conversation “at least half the time” (Figure E2). When providers were asked to consider how to improve adherence to treatment and for additional suggestions to improve management of overweight and obesity in the pediatric population, 32% pediatric providers and 23% of family practice providers expressed their frustration with the lack of a nutritionist or dietician in the clinic (Appendix E, Figure E4). Providers were asked about overweight and obesity knowledge and whether they used available free resources. Forty percent



of participants reported being aware of free resources but 62% of providers reported never using them, and 38% used the resources every once in a while (see Appendix E, Table E5 and Figure E3).

### **Discussion**

The impact of this DNP project includes the identification of gaps in provider resources, support for the need in change to practice in clinic, and the identification of areas needing further training and support. Evidence supports the idea that MI can have a positive impact on promoting healthy patient change behaviors (Kaufman et al., 2020; Grossman et al., 2017).

Practice changes, as a result of the results of this survey, will provide prioritizing and direction for increased awareness of the needs for ongoing provider training, work with providers to improve weight management practice and help to align practice with the USPSTF recommendations discussed by Grossman et al., (2017) into current practice. Implemented practice changes could provide a positive impact on self-awareness and self-efficacy in provider management of overweight and obese pediatric and adolescents. When this evidence is implemented into practice, providers and parents would be equipped with consistent recommendations and tools to effectively manage pediatric overweight and obesity. Provider increased autonomy and self-efficacy has the potential to impact patient health, education and provider's clinical practice (Barlow et al., 2018). Parents would be provided with evidence-based, reliable resources to support children's path of sustaining a healthy lifestyle and maintaining an appropriate BMI according to CDC (2020) standards and expert committee recommendations. Sustaining the evolved changes would require that leadership implement the recommended suggestions based on the findings and reassess with an additional needs assessment in 6 months to evaluate practice changes.

According to the results of the needs assessment, providers recognized the need for improved weight loss interventions, yet experienced limitations in the availability of appointments with the necessary time allotments to efficiently address weight concerns. The evidence obtained from the need assessment indicates that pediatric overweight and obesity management in this military clinic requires changes that include availability of, a multidisciplinary team to include a dietician and a nutritionist, built-in 30 minute slots specifically for addressing weight issues, and ongoing provider training to increase self-efficacy in pediatric weight management. Bohlin et al. (2017) noted that providers offering parents a choice of available resources and individualized plans that suites military families schedule, may encourage positive self-efficacy in providers and parental response that effect positive change in provider practice, and in turn have a positive effect a child's weight. The results of these findings in regard to motivational interview implies that ensuring providers in the pediatric as well as the family practice clinic has regular and refresher training will promote an increase in confidence for providers and will have an impact on the 31% of disqualified American youth that Maxey and Goodman (2018) have discussed.

Limitations and barriers encountered during this project include the use of convenience sampling. Restrictions in access to patients and providers due to the COVID-19 pandemic caused unforeseen provider unavailability due to deployments relating to COVID-19 vaccine distribution. Project findings support evidence from synthesized literature that acknowledges provider awareness of the problem of overweight and obesity, but they acknowledge it would be beneficial to have multidisciplinary team support, provider ongoing training and availability of referral resources. Although some valuable information was gained from this needs assessment, the results are not generalizable due to its focus on one clinic and the small sample size of

recruited providers that completed the survey. Nonetheless, further recommended research may include performing a similar pediatric provider focused needs assessment across the entire department of defense pediatric clinics and, subsequently implementing the action necessary to address the recognized provider's needs where financially feasible in this clinic. Future needs assessment should include strategies to ease the clinic financial burden required to implement pediatric overweight and obesity management programs. In addition, inviting military families with overweight and obesity to participate in this needs assessment can help determine patient and family perceived barriers to a healthy lifestyle.

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## Appendix A

## Evaluation and Synthesis Tables

Table A1

## Evaluation Table of Studies

Citation	Conceptual Framework	Design/Method	Sample/Setting	Major Variables & Definitions	Measurement	Analysis	Findings	Decision for Use
Bohlin et al., (2017). Childhood obesity treatment: telephone coaching is as good as usual care in maintaining weight loss – a randomized controlled trial  <b>Funding:</b> Stockholm County Council  <b>Bias:</b> none mentioned	care model & self-determination Theory inferred	<b>Design:</b> open-label RCT  <b>Purpose:</b> to evaluate the long-term efficacy, in terms of patients' weight status, of replacing usual care (UC) physical visits with more frequent but shorter telephone coaching (TC) sessions as part of a structured childhood obesity treatment	N: 40 <b>DI:</b> 18months <b>n:</b> 20 (EG1) <b>n:</b> 20 (CG) <b>Age:</b> 5-14yrs FG in CG: 47% FG in IV1 22% (P=0.1) <b>IC:</b> 5-14y.o with obesity <b>EC:</b> obesity related syndrome, non-Swedish speaking families <b>Attrition rate:</b> none noted	<b>IV1:</b> telephone coaching  <b>CG:</b> usual care  <b>DV1:</b> change in BMI-SDS	questionnaire, international body mass index standard deviation score	ANOVA, t-test, chi-squared test, SAS Statistical software (version 9.4)	<b>CG:</b> -0.12 (0.43) units (p = 0.4).  <b>DV1:</b> mean (SD) -0.16 (0.39) and BMI SDS units (p = 0.1)  change in BMI SDS (p > 0.8)  (p = 1.0), no significant change in BMI SDS btw CG & IV1	<b>LOE:</b> II  <b>Strengths:</b> RCT; no dropout during treatment follow-up, recruitment to be appropriate for the primary outcome  <b>Weaknesses:</b> alliance between healthcare personnel and the patient can be difficult to establish; possibility of a dose effect of the number of sessions; study had a limited number of participants and great variation in the degree of obesity  <b>Applicability:</b> it is possible to maintain BMI SDS changes equally using either

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Citation	Conceptual Framework	Design/Method	Sample/Setting	Major Variables & Definitions	Measurement	Analysis	Findings	Decision for Use
<b>Country:</b> Sweden								face-to-face or flexible TC sessions to achieve behavioral change
Boutelle et al., (2017). Effect of Attendance of the Child on Body Weight, Energy Intake, and Physical Activity in Childhood Obesity Treatment: A RCT  <b>Funding:</b> University of California, San Diego  <b>Bias:</b> none mentioned  <b>Country:</b> United States	linear mixed effects (LME) regression models	<b>Design:</b> RCT  Measures were collected at baseline, 3-6-12 & 18 months  <b>Purpose:</b> determine whether PBT is similarly effective as FBT on child weight loss over 24 months; evaluated the effect of FBT & PBT on parent weight loss, child and parent dietary intake, child and parent physical activity, parenting style, and parent feeding behaviors.	N: 150  <b>DI:</b> 10week <b>n:</b> 75 (EG) <b>n:</b> 75 (CG) <b>MA1:</b> 10.4yrs <b>MA2:</b> 42.9yrs <b>Setting:</b> at an academic medical center  <b>IC:</b> 8-12.9 yrs. with BMI 85 <sup>th</sup> to 99.9 <sup>th</sup> %tile with parent w/ BMI <25 who read @ 5 <sup>th</sup> grade level of higher;  <b>EC:</b> child/parent psych disorder, diagnosed physical illness, eating disorder;	<b>IV1:</b> PBT  <b>CG:</b> FBT  <b>DV1:</b> children BMI & BMI z @ 6,12 & 18mths  <b>DV2:</b> parents (BMI) weight loss	Anthropometry (child & parent) BMI percentile calculated, nutrition data system for research software, ACTi Life software, version 6.11, Birch Child Feeding Questionnaire (parent)	2 tailed upper bound of 90% CI, SAS Proc Power with $\alpha = .10$ , Analysis of longitudinal outcomes, multivariate imputation by chained equations	<b>CG:</b> -0.12 (0.43) units (p = 0.4).  @6mths <b>DV1</b> = -0.25  <b>DV1</b> BMIz: value a::0.001, 95%CI:-0.06 to 0.06, p value: .96  <b>DV2</b> BMI value a: 0.154, 95%CI: -0.40 to 0.71, p value: .10  effect interval > noninferiority margin of -0.13 to -0.065 & thus support noninferiority	<b>LOE:</b> II  <b>Strengths:</b> RCT; no dropout during treatment follow-up, noninferiority testing used, racial/ethnic diversity, validated treatment tools used, 24mth observation  <b>Weaknesses:</b> limited generalizability due to age range 8-15 limits, no placebo controlled intervention  <b>Applicability:</b> Parent-based treatment is a viable model to provide weight loss treatment to children.

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			Attrition rate: none noted					
Dickey et al. (2016) Outpatient evaluation, recognition, and initial management of pediatric overweight and obesity in U.S. military medical treatment facilities  <b>Funding:</b> Office of the Assistant Secretary of Defense & Chief Medical Officer  <b>Bias:</b> due to inadequate ICD-9 CM and CPT allocation during encounter  <b>Country:</b> U.S.	Behavior modification theory inferred	<b>Design:</b> retrospective chart review study: random sampling  <b>Purpose:</b> investigated outpatient evaluation and initial management of overweight and obese pediatric patients in U.S. military medical treatment facilities (MTFs).	N: 920 NSS: 42 DI: 2yrs n: 579 (EG1) n: 341 (EG2) MA: 10 IC: Tricare-prime enrolled, BMI >%tile; age 3-17yrs. EC: >18yrs. Attrition rate:~30%	<b>IV1:</b> evidence if diagnostic weight status counseling  <b>CG:</b> generic BMI counseling  <b>DV1:</b> counseling rate Laboratory screening  <b>DV2:</b> code diagnostic recognition of obese patients	Power calculations, HEDIS guidelines  data tables from the MHS Data Repository (MDR)	SAS 9.3	<b>DV1:</b> were recorded for 43.1% of those aged 3–11 and for 28.3% of those aged 12–17 (p < .001)  <b>DV2:</b> recorded for 55.6% of those aged 3–11 and for 38.6% of those aged 12–17 (p < .01)	LOE: IV  <b>Strengths:</b> DoD-approved secure servers and any personal identifiers removed prior to analysis, Professional abstractors were trained on the data collection instrument, searched visit records & abstracted documentation  <b>Weaknesses:</b> Not randomized, variables not adequately personalized,  <b>Applicability:</b> Improvements to electronic health records or implementation of local procedures to facilitate better diagnostic recording can likely improve adherence to clinical practice guidelines.

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Citation	Conceptual Framework	Design/Method	Sample/Setting	Major Variables & Definitions	Measurement	Analysis	Findings	Decision for Use
Rhee et al. (2018). Provider views on childhood obesity management in primary care settings: A mixed methods analysis  <b>Funding:</b> None  <b>Bias:</b> None mentioned  <b>Country:</b> USA	Collaborative care model, Chronic care model	<b>Design:</b> Mixed Method/qualitative methods  <b>Purpose:</b> examine the views of pediatric providers on conducting obesity management in the primary care setting	N: 110 pediatricians invited to participate n: 42 participated (38.2%)  FG: 68.2% Cau: 81.8% 4 focus groups from 4 locations in large pediatric network  follow-up survey done  <b>Attrition rate:</b> n/p	4 point Likert scale used  How effective in behavioral management  Role in weight management  Mean  Frequency	30-item Questionnaire  Assess current practice in obesity management	Qualitative software-Atlas.ti V-7.5.11. SAS v9.4 used for descriptive analysis	50% never did childhood obesity training  31.8% done some obesity CME course Barriers: parental level-lack of parent motivation provider level-lack of knowledge & confidence Practice-base: lack of time, poor training, lack of resources  23.8% report effective in behavioral management  95%interested in learning new techniques	LOE: VI  <b>Strengths:</b> collaborative model may result in improved health outcome, increase access to families, more efficient and effective use of skills and resources  <b>Weaknesses:</b> low response rate to survey, low level of evidence. Evaluation occurred in one pediatric group. Not generalizability  <b>Applicability:</b> Can be effective in facilitating change
Resnicow et al., (2015). Motivational	Motivational Interviewing, coordinated	<b>Design:</b> RCT	N: 645 NSS: 42 DI: 2yrs	IV1: MI from PCP (4 sessions)	Standardized MI fidelity scale; DVD	2-tailed $\alpha$ Alpha = 0.05	DV1: 90.3, 88.1, 87.1%tile	LOE: II

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<p>Interviewing and Dietary counseling for obesity in Primary Care: An RCT</p> <p><b>Funding:</b> grant from the US NIH National Heart, Lung, &amp; Blood Institute; US Health Resources &amp; Services Administration Maternal and Child Health Bureau &amp; the American Academy of Pediatrics.</p> <p><b>Bias:</b> None mentioned</p> <p><b>Country:</b> US</p>	care model & self-determination theory, mixed effect	<p><b>Purpose:</b> test the efficacy of moderate-intensity (4 sessions) PCP MI-based counseling and the effect of adding 6 MI-based counseling sessions by RDs delivered to parents of overweight youth aged 2-8 yrs.</p>	<p><b>n:</b> 212 (EG1) <b>n:</b> 235 (EG2) <b>n:</b> 198(CG) <b>MA:</b> 5.1 <b>IC:</b> 85th - 97th %tile BMI; must speak English; working phone <b>EC:</b> child under current subspecialty care for overweight/obesity, currently taking weight-altering medication <b>Attrition rate:</b> ~30%</p>	<p><b>IV2:</b> MI from PCP (4 sessions) &amp; RD (6 sessions).</p> <p><b>CG:</b> usual care</p> <p><b>DV1:</b> Child BMI %tile @ 2yrs follow-up</p> <p><b>DV2:</b> fruit/vegetable, sweet beverage, change in physical activity</p>	training system focusing on pediatric obesity		<p><b>DV2</b> mean was * (<math>p = .02</math>) ↓ than CG; effect, <math>p = .049</math>.</p> <p>effects on BMI were ≠</p>	<p><b>Strengths:</b> RCT; 1<sup>st</sup> large scale trial that shows statistically significant ↓ in BMI by using MI delivered by PCPs and RDs</p> <p><b>Weaknesses:</b> gap in care coordination between PCPs and RDs, leading to lack of care integration, as a partial explanation for the low session completion rate among RDs. Generalizability limited due to a 30% attrition rate in multiple demographic variable. PROS practice did research protocol in the past &amp; may skew generalization of this study to pediatric practices outside of PROS practices.</p> <p><b>Applicability:</b> Has significant dissemination potential in overweight children whose parents received MI counseling from their PCPs supplemented by RD counseling; it showed a significant ↓ in BMI %tile. Motivational interviewing,</p>

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								delivered by trained providers in the primary care setting can be an important and feasible part of addressing childhood obesity.
Robertson et al., (2017). Evaluating effectiveness and cost-effectiveness of 'Families for Health V2' (FFH) compared with usual care (UC).  <b>Funding:</b> National Institute for Health Research (NIHR)  <b>Bias:</b> none mentioned  <b>Country:</b> England	three-level hierarchical mixed-effects model	<b>Design:</b> multicenter investigator blind RCT with follow-up @ 3 & 12mths  <b>Purpose:</b> Can family group based program help families with children who are overweight. Aim to help parents develop their parenting skills to enable them to bring about lifestyle change within the family	N: 115 families  <b>DI:</b> 10 weeks <b>n:</b> 56 (EG1) <b>n:</b> 59 (CG) <b>Age:</b> 6-11yrs FG 65 MG 63  <b>IC:</b> 6-11y.o with BMI ≥ 91 <sup>st</sup> %tile  <b>EC:</b> obesity related syndrome, non-English speaking families, behavior problems  <b>Attrition rate:</b> not mentioned	<b>IV1:</b> lifestyle  <b>CG:</b> usual care  <b>DV1:</b> change in BMI z-score	The Satterthwaite approximation c, European Quality of Life-5 Dimensions Youth version, change of -0.25 in BMI z-score is *	R versions 2.10 & 3.0, SAS Statistical software (version 9.4)	<b>CG:</b> BMI  <b>DV1:</b> ↓ 0.25 (p=0.360), *  ≠ change CG BMI z-score @ 12 mths 0.114, 95% confidence interval (CI) – 0.001 to 0.229; p = 0.053  BMI z-score of CG ↓ -0.118, 95% CI -0.203 to -0.034; p = 0.007	<b>LOE:</b> II  <b>Strengths:</b> RCT; specified framework and mixed-methods data collection used across a wide range of sources enabling triangulation of results, had a effectiveness and cost-effectiveness components  <b>Weaknesses:</b> large differential follow-up @ 12months, lack of detailed attendance data from CG  <b>Applicability:</b> program has some impact on parenting attitudes and behavior, but does not translate sufficiently into a weight reduction  Not applicable due to neither effective nor cost-effective in

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Citation	Conceptual Framework	Design/Method	Sample/Setting	Major Variables & Definitions	Measurement	Analysis	Findings	Decision for Use
								helping families to manage the weight of overweight children.
Taveras et al., (2017) Comparative Effectiveness of Clinical-Community Childhood Obesity Interventions RCT  <b>Funding:</b> NIH Intramural Research Program, Pilot intermural research award from USUHS  <b>Bias:</b> None mentioned  <b>Country:</b> US	Self-efficacy (inferred)	<b>Design:</b> RCT  <b>Purpose:</b> examine the extent to which 2 clinical-community interventions improve child BMI z score and health-related quality of life, as well as parental resource empowerment	N: 721 <b>DI:</b> 1 year <b>n:</b> 321 (IG) <b>n:</b> 320 (CG2)  <b>IC:</b> parent of children age 2-12 yrs, BMII >85th %tile  <b>EC:</b> child 2-12.9, not leaving local area w/I study timeframe,  <b>Attrition rate:</b> ≥80% sessions by condition	<b>IV:</b> provider education & MI coaching  <b>CG:</b> provider education  <b>DV1:</b> BMI z score  <b>DV2:</b> parental empowerment  <b>DV3:</b> psychosocial functioning	CDC growth chart, CDC BMI parameters, telephone survey, PQL4.0	t-test, X2 test, linear mixed effects model, SAS v 9.4	DV1-1.85 (0.58) @1yr improvement of -0.06 DV1 (95% CI, -0.10 to -0.02).  ≠ (-0.02 units; 95% CI, -0.08 to 0.03; p = .39).  DV2 3.2(0.6), 95%CI 0.22, 0.15 to 0.28,	LOE: II  <b>Strengths:</b> RCT; generalizable to large primary setting  <b>Weaknesses:</b> Intervention did not decrease the percentage of children with severe obesity, not generalizable to small pediatric clinics  <b>Applicability:</b> resulted in improved parent-reported outcomes for childhood obesity and improvements in child BMI

**Key:** AA African America; APM Anthropometrics AS Asian BMI Body Mass Index BMI2 – Brief Motivational Interviewing; BTW between Cau Caucasian race, CC Comparable Condition CDS Clinical Decision Support CG Control Group RCT Randomized Control Trial DI Duration of intervention DQ Descriptive Qualitative DV Dependent variables EC Exclusion criteria, EG – experimental group; EMR – electronic medical record; FBT: family-based treatment; FG –female gender; Hisp Hispanic HEDIS Health effectiveness data & information set HRS hours IC Inclusion criteria IPT Interpersonal psychotherapy IV Independent variables LME Linear mixed effect model LOC Loss of control LOE Level of evidence MTA Metanalysis; MA Mean age MG Male gender; N Number of participants; n – # of patients in each arm MI Motivational Interviewing Mn Months NDS Nutrition data system NIH – National Institute of Health; n/p – not provided; NSS Number of sites; PA Physical activity PBT Parent based treatment PCP Primary care provider PEQ: Physical exam questionnaire; PQL: pediatric quality of life; PRQ: parent reported questionnaire Qc- Contrast Q-statistics QOL Quality of life; RD Registered dietitian; SR Systematic review; TV Television USUHS Uniformed Services University of the Health Sciences w/o without YRS years # Number \* Statistically significant ↑ Increased; ↓ Decreased ≠ - No statistically significant

Citation	Conceptual Framework	Design/Method	Sample/Setting	Major Variables & Definitions	Measurement	Analysis	Findings	Decision for Use
Taveras et al., (2015). Comparative effectiveness of childhood obesity interventions in pediatric primary care: a cluster-randomized clinical trial  <b>Funding:</b> from the American Recovery and Reinvestment Act  <b>Bias:</b> None recognized <b>Country:</b> United States	Chronic care model	<b>Design:</b> CRCT  <b>Purpose:</b> To examine the extent to which computerized CDS delivered to pediatric clinicians at the point of care of obese children, with or w/o individualized family coaching; improved BMI	<b>NSS:</b> 14 <b>N:</b> 549 <b>n:</b> 194 (EG1) <b>n:</b> 171 (EG2) <b>n:</b> 184 (CG)  <b>Setting:</b> 14 pediatric primary care clinic in community health centers  <b>Demographics</b> <b>Cau:</b> 63%, <b>AA:</b> 15%, <b>AS:</b> 8%, <b>Hisp:</b> 6%, other 8%. <b>MA</b> 9.8; <b>FG</b> in N 46.8%  <b>IC:</b> children 6.0-12.9 yrs. at baseline; <b>BMI</b> $\geq 95^{\text{th}}$ %tile for age and sex at baseline; parents can respond to questionnaires	<b>IV1:</b> electronic CDS  <b>IV2:</b> electronic CDS+ coaching  <b>CG:</b> usual care  <b>DV1:</b> BMI  <b>DV2:</b> use of HEDIS measures	EMR coding for BMI %tile & HEDIS measures; diagnosis of obesity; appropriate referral; changes from baseline BMI; validated semi-quantitative child food frequency questionnaire; physical activity; TV viewing; Project Viva Age 11 questionnaire to measure sleep quantity and quality	Cluster-randomize d <i>t</i> -test; PASS 2002 software; generalized mixed effect models; intention-to treat analysis	<b>DV1</b> $\uparrow$ less during 1 year (-0.51 [95% CI, -0.91 to -0.11])  (-0.34 [95% CI, -0.75 to 0.07])  OR 2.60 [95% CI, 1.25-5.41])	<b>LOE:</b> I  <b>Strengths:</b> RCT design; supports existing comparative effectiveness research evidence that behavioral interventions can improve BMI in children  <b>Weakness:</b> No discussion of attrition rate. Sample Demographics: race/ethnicity and parent place of birth unbalanced at baseline <b>Applicability:</b> computerized CDS for pediatric clinicians & support for self-guided behavior change for families can improved childhood BMI. Both interventions will improved the quality of care for childhood obesity.

**Key:** AA African America; APM Anthropometrics AS Asian BMI Body Mass Index BMI2 – Brief Motivational Interviewing; BTW between Cau Caucasian race, CC Comparable Condition CDS Clinical Decision Support CG Control Group RCT Randomized Control Trial DI Duration of intervention DQ Descriptive Qualitative DV Dependent variables EC Exclusion criteria, EG – experimental group; EMR – electronic medical record; FBT: family-based treatment; FG –female gender; Hisp Hispanic HEDIS Health effectiveness data & information set HRS hours IC Inclusion criteria IPT Interpersonal psychotherapy IV Independent variables LME Linear mixed effect model LOC Loss of control LOE Level of evidence MTA Metanalysis; MA Mean age MG Male gender; N Number of participants; n – # of patients in each arm MI Motivational Interviewing Mn Months NDS Nutrition data system NIH – National Institute of Health; n/p – not provided; NSS Number of sites; PA Physical activity PBT Parent based treatment PCP Primary care provider PEQ: Physical exam questionnaire; PQL: pediatric quality of life; PRQ: parent reported questionnaire Qc- Contrast Q-statistics QOL Quality of life; RD Registered dietitian; SR Systematic review; TV Television USUHS Uniformed Services University of the Health Sciences w/o without YRS years # Number \* Statistically significant  $\uparrow$  Increased;  $\downarrow$  Decreased  $\neq$  - No statistically significant

Citation	Conceptual Framework	Design/Method	Sample/Setting	Major Variables & Definitions	Measurement	Analysis	Findings	Decision for Use
			and interviews in English  <b>EC:</b> at least one parent unable to follow study procedures for 1 year; families who plan to leave medical practice within the study time frame; child with emotional or mental difficulties, chronic conditions that interfere with growth.  <b>Attrition:</b> n/p					
Yackobovitch-Gavan et al., (2018). Intervention for childhood obesity based on parents only or parents and child	Mixed-effects regression model	<b>Design:</b> open-label RCT, 3mths intervention  <b>Purpose:</b> assess the effects of family-based	N: 247 <b>NSS:</b> <b>DI:</b> 2 yrs. <b>n:</b> 89 (EG1) <b>n:</b> 84 (EG2) <b>n:</b> 74 (CG) <b>FG:</b> 67% <b>Age:</b> 5-11 yrs	<b>IV1:</b> parent only  <b>IV2:</b> parent & child.  <b>CG:</b> follow-up alone	Anthropometric, physical examination, questionnaire	Two-tailed, $\alpha=0.05$ , SD= 5%SPSS software v22, paired samples t-test,	<b>CG @3mths :</b> $1.73 \pm 0.32$ to $1.70 \pm 0.31$ , $p = .301$ , 95%CI: -0.09, 0.02	<b>LOE:</b> II  <b>Strengths:</b> RCT; findings in line with recent met-analysis  <b>Weaknesses:</b> low quality of the studies, the heterogeneous

**Key:** AA African America; APM Anthropometrics AS Asian BMI Body Mass Index BMI2 – Brief Motivational Interviewing; BTW between Cau Caucasian race, CC Comparable Condition CDS Clinical Decision Support CG Control Group RCT Randomized Control Trial DI Duration of intervention DQ Descriptive Qualitative DV Dependent variables EC Exclusion criteria, EG – experimental group; EMR – electronic medical record; FBT: family-based treatment; FG –female gender; Hisp Hispanic HEDIS Health effectiveness data & information set HRS hours IC Inclusion criteria IPT Interpersonal psychotherapy IV Independent variables LME Linear mixed effect model LOC Loss of control LOE Level of evidence MTA Metanalysis; MA Mean age MG Male gender; N Number of participants; n – # of patients in each arm MI Motivational Interviewing Mn Months NDS Nutrition data system NIH – National Institute of Health; n/p – not provided; NSS Number of sites; PA Physical activity PBT Parent based treatment PCP Primary care provider PEQ: Physical exam questionnaire; PQL: pediatric quality of life; PRQ: parent reported questionnaire Qc- Contrast Q-statistics QOL Quality of life; RD Registered dietitian; SR Systematic review; TV Television USUHS Uniformed Services University of the Health Sciences w/o without YRS years # Number \* Statistically significant ↑ Increased; ↓ Decreased ≠ - No statistically significant

Citation	Conceptual Framework	Design/Method	Sample/Setting	Major Variables & Definitions	Measurement	Analysis	Findings	Decision for Use
<p>compared with follow-up alone. <b>Funding:</b> Health Policy Research Grant from the Clalit Research Institute</p> <p>Pediatrics.</p> <p>Bias: publication bias</p> <p>Country: Israel</p>		<p>interventions targeted to parents only or to parents-and-child for the prevention and treatment of childhood obesity.</p>	<p><b>IC:</b> 5-11y.o &amp; 85th -98th %tile BMI;</p> <p><b>EC:</b> chronic conditions, medication use that may influence weight</p> <p><b>Attrition rate:</b>~25%</p>	<p><b>DV1:</b> clinical &amp; lifetime outcome</p> <p><b>DV2:</b> change in BMI-SDS</p>		<p>spearman correlation, Wilcoxon signed-rank test, McNemar test, one-ay analysis variance, Kruskal-Wallis test, chi-squared test, Comprehensive Meta-analysis (CMA) software,</p>	<p><b>DV1 @</b> 3mths: BMI ↓ 1.74 ± 0.31 to 1.66 ± 0.36, p &lt; .001</p> <p><b>DV2 @</b> 2yrs: BMI ↓ 1.56 ± 0.46, p = .006</p> <p><b>DV2 @</b> 2 yrs: ↓ BMI SDS 1.56 ± 0.46 p =.006</p> <p>3mth: r= -0.382, p =.005</p>	<p>interventions and comparators, the high rates of non-completion</p> <p><b>Applicability:</b> An intervention program that focuses on both parents and children was found to have positive short-term and long-term effects on BMI-SDS. mutual understanding between parents and child is needed to instill a lasting change in eating habits</p>
<p>Yavuz et al., (2015). Interventions aimed at reducing obesity in early childhood: a meta-analysis of</p>	Random effects models	<p><b>Design:</b> meta-analysis</p> <p><b>Purpose:</b> investigate the effectiveness of different types of obesity intervention</p>	<p>N: 49 publications long-term: 26 studies short-term: 50 publication</p> <p><b>Sample size:</b> 17-1788</p>	<p><b>CG:</b> dummy intervention, no intervention</p> <p><b>DV1:</b> interaction only,</p>	<p>Kappa values for agreement were &gt; .80 for categorical variables and intraclass correlations were &gt;.70 for</p>	<p>Comprehensive Meta-analysis (CMA) software</p> <p>Multivariate meta-regression</p>	<p>Short-term: small but significant(d = .08, 95% CI = .04, .13, p &lt; .01)</p> <p>Long-term: (d = .09, 95%</p>	<p><b>LOE:</b> I</p> <p><b>Strengths:</b> meta-analysis, consistent with findings from other meta-analyses on interventions involving parents and children</p>

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Citation	Conceptual Framework	Design/Method	Sample/Setting	Major Variables & Definitions	Measurement	Analysis	Findings	Decision for Use
<p>programs that involve parents.</p> <p><b>Funding:</b> grant from the US NIH National Heart, Lung, &amp; Blood Institute; US Health Resources &amp; Services Administration Maternal and Child Health Bureau &amp; the American Academy of Pediatrics.</p> <p><b>Bias:</b> publication bias</p> <p><b>Country:</b> North America, Europe, Latin America, Asia, Australia</p>		<p>programs targeted at young children and involving parents</p>	<p><b>Publication dates:</b> 2003-2013</p> <p><b>DI:</b> between 6 &amp; 25 months</p> <p><b>IC:</b> effectiveness of a preventive intervention or treatment on a weight-related outcome RCT design, children up to 6 years old, with levels or types of parental involvement that vary between the intervention &amp; control</p> <p><b>EC:</b> intellectual disability, not published in English, investigate</p>	<p>noninteractive only, mixed</p>	<p>continuous variables</p> <p>Contrast Q-statistics (Qc), funnel plots and fail-safe numbers</p>	<p>analyses, one-tailed</p>	<p>CI = .01, .16, <math>p &lt; .05</math>) heterogeneous (with Qh = 85.64, <math>p &lt; .001</math> for short-term follow-up and Qh = 43.41, <math>p &lt; .05</math> for long-term follow-up results</p> <p>Targeted interventions more effective <math>d = .29</math></p>	<p><b>Weaknesses:</b> data not split into homogenous subsets, scarcity of studies</p> <p><b>Applicability:</b> intervention programs were effective in obtaining changes in weight status of young children at short-term follow-up. programs using one mode of intervention were more effective, which is also relevant to cost-effectiveness because fewer resources may be required for single-mode interventions</p>

**Key:** AA African America; APM Anthropometrics AS Asian BMI Body Mass Index BMI2 – Brief Motivational Interviewing; BTW between Cau Caucasian race, CC Comparable Condition CDS Clinical Decision Support CG Control Group RCT Randomized Control Trial DI Duration of intervention DQ Descriptive Qualitative DV Dependent variables EC Exclusion criteria, EG – experimental group; EMR – electronic medical record; FBT: family-based treatment; FG –female gender; Hisp Hispanic HEDIS Health effectiveness data & information set HRS hours IC Inclusion criteria IPT Interpersonal psychotherapy IV Independent variables LME Linear mixed effect model LOC Loss of control LOE Level of evidence MTA Metanalysis; MA Mean age MG Male gender; N Number of participants; n – # of patients in each arm MI Motivational Interviewing Mn Months NDS Nutrition data system NIH – National Institute of Health; n/p – not provided; NSS Number of sites; PA Physical activity PBT Parent based treatment PCP Primary care provider PEQ: Physical exam questionnaire; PQL: pediatric quality of life; PRQ: parent reported questionnaire Qc- Contrast Q-statistics QOL Quality of life; RD Registered dietitian; SR Systematic review; TV Television USUHS Uniformed Services University of the Health Sciences w/o without YRS years # Number \* Statistically significant ↑ Increased; ↓ Decreased ≠ - No statistically significant

Citation	Conceptual Framework	Design/Method	Sample/Setting	Major Variables & Definitions	Measurement	Analysis	Findings	Decision for Use
			specific control diet					

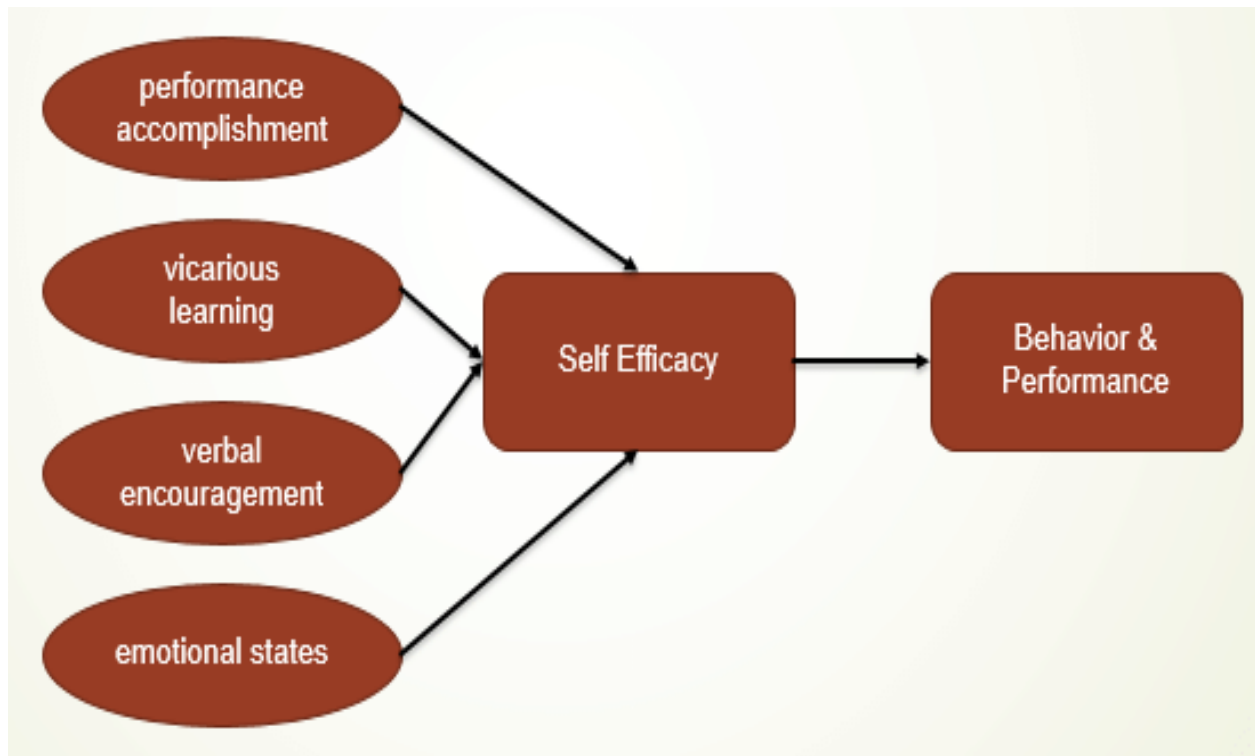
**Key:** **AA** African America; **APM** Anthropometrics **AS** Asian **BMI** Body Mass Index **BMI2** – Brief Motivational Interviewing; **BTW** between **Cau** Caucasian race, **CC** Comparable Condition **CDS** Clinical Decision Support **CG** Control Group **RCT** Randomized Control Trial **DI** Duration of intervention **DQ** Descriptive Qualitative **DV** Dependent variables **EC** Exclusion criteria, **EG** – experimental group; **EMR** – electronic medical record; **FBT**: family-based treatment; **FG** –female gender; **Hisp** Hispanic **HEDIS** Health effectiveness data & information set **HRS** hours **IC** Inclusion criteria **IPT** Interpersonal psychotherapy **IV** Independent variables **LME** Linear mixed effect model **LOC** Loss of control **LOE** Level of evidence **MTA** Metanalysis; **MA** Mean age **MG** Male gender; **N** Number of participants; **n** – # of patients in each arm **MI** Motivational Interviewing **Mn** Months **NDS** Nutrition data system **NIH** – National Institute of Health; **n/p** – not provided; **NSS** Number of sites; **PA** Physical activity **PBT** Parent based treatment **PCP** Primary care provider **PEQ**: Physical exam questionnaire; **PQL**: pediatric quality of life; **PRQ**: parent reported questionnaire **Qc**- Contrast Q-statistics **QOL** Quality of life; **RD** Registered dietitian; **SR** Systematic review; **TV** Television **USUHS** Uniformed Services University of the Health Sciences **w/o** without **YRS** years # Number \* Statistically significant ↑ Increased; ↓ Decreased ≠ - No statistically significant

**Table A2***Synthesis Table*

AUTHOR	Bohlin et al.	Boutelle et al.	Dickey et al.	Rhee et al.	Resnicow et al.	Robertson et al.	Taveras et al.	Taveras et al.	Yackobovitch-Gavan et al.	Yavuz et al.
YEAR	2017	2017	2016	2018	2015	2017	2017	2015	2018	2015
Design/LOE	RCT/II	RCT/II	RS/IV	MixMethod/VI	CRCT/I	RCT /II	RCT/II	CRCT/I	RCT/II	MTA/I
Demographic		Study Characteristics								
MSD Age C/P	9.5	10 /43	10	-	5.1	8.5	7	9.8	8	6
FG C/P (%)	47	66 /77	-	-	-	65	-	46.8	67	73
DOI (mths)	18	24	24	Not disclosed	24	12	12	12	24	3 to 36
SS/NSS	40	150 dyads	920 /28	42	645/42	115 dyads	721	549/14	247	49
IV – Interventions										
CBT	X	X		X	X					
MI	X	X			X				X	X
Structured Education		X online		-			X	X		X
PBC	X	X			X		X	X		X
SG				X		X		X	X	X
Obesity protocol			X							
DV										
BMI SDS	↓≠	↓*		-	↓*				↓*	↓ *
BMI z						↓*CG	↓≠	↓+		
BC				↑*			↑			
CE						↑ IG				
BMI recording adherence			↑							
SE	↑	↑*		↑+	↑		↑			↑short term

**Key:** BC-Behavior Change BMI Body Mass Index BMI z-score BMI SDS Standardized Body Mass Index C/P Child/Parent CBT Cognitive Behavioral Therapy CE Cost DOI duration of Intervention Effectiveness FG Female gender LOE Level of evidence MI Motivational Interview MSD Mean Standard Deviation MT measurement Tool NSS Number of sites PBC Parent-based face to face/phone coaching RCT Randomized Control Trial RS Retrospective Study SS Sample Size SE Self-efficacy SG Support Group \* Statistically significant; ↑ Increased; ↓ Decreased ≠ - No statistically significant

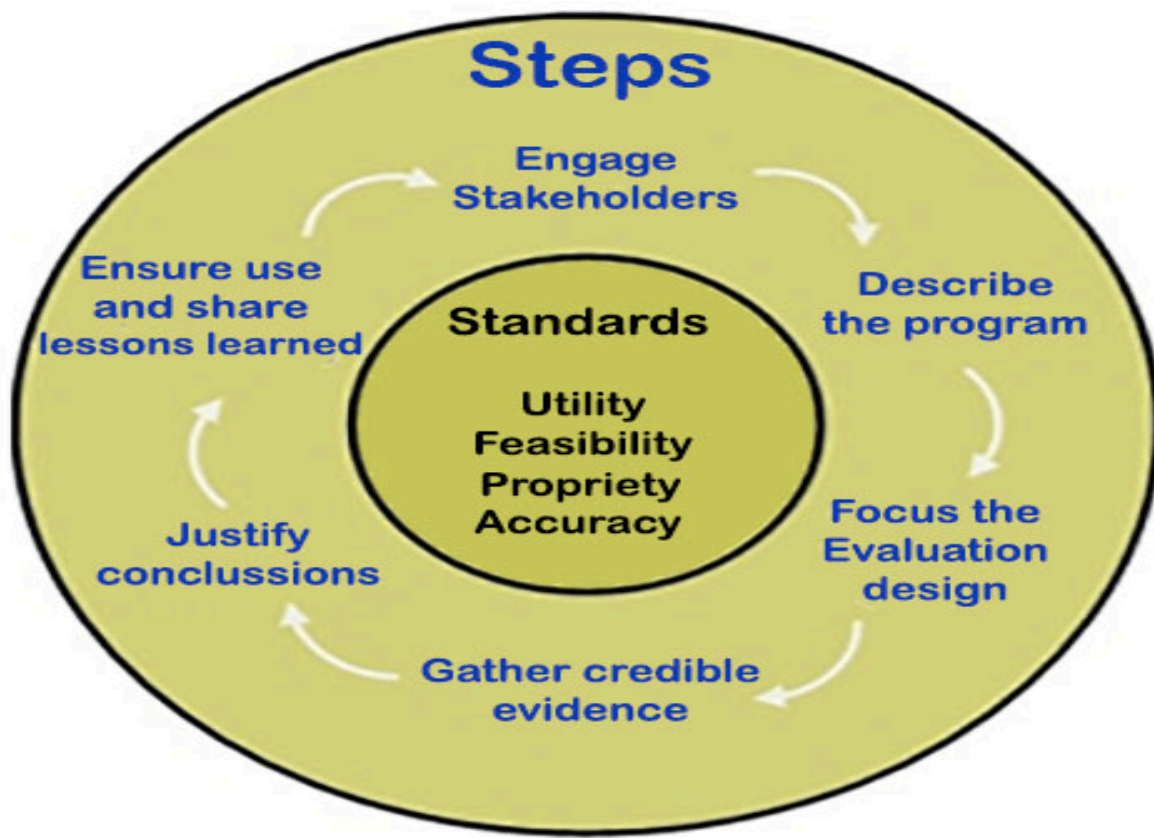


**Appendix B****Models and Frameworks****Figure 1***Self-Efficacy Theory*

Bandura, A. Self- Efficacy Theory (1977)

**Figure 2**

*The Center for Disease Control and Prevention Framework*



**CDC Evaluation Framework**

cdc.gov. (2004)

## Appendix C

## Internal Review Board Approval



## EXEMPTION GRANTED

[Diana Jacobson](#)  
[EDSON: DNP](#)  
 602/496-0863  
[DIANA.JACOBSON@asu.edu](mailto:DIANA.JACOBSON@asu.edu)

Dear [Diana Jacobson](#):

On 12/3/2020 the ASU IRB reviewed the following protocol:

Type of Review:	Initial Study
Title:	Pediatric Primary Care Overweight and Obesity Management: An Assessment of Provider Needs to Improve Comprehensive Care to Military Dependents
Investigator:	<a href="#">Diana Jacobson</a>
IRB ID:	STUDY00012940
Funding:	None
Grant Title:	None
Grant ID:	None
Documents Reviewed:	<ul style="list-style-type: none"> <li>• GoldingS IRB Protocol, Category: IRB Protocol;</li> <li>• GoldingS_Pedsobesity_cover letter_ 12-01-20.pdf, Category: Recruitment Materials;</li> <li>• GoldingS_Survey Reminder Email.pdf, Category: Recruitment Materials;</li> <li>• HIPPA Privacy, Category: Other;</li> <li>• letter of support.pdf, Category: Other;</li> <li>• QuestionPro Survey , Category: Measures (Survey questions/Interview questions /interview guides/focus group questions);</li> <li>• Sample QuestPro Generated message, Category: Recruitment Materials;</li> </ul>

The IRB determined that the protocol is considered exempt pursuant to Federal Regulations 45CFR46 (2) Tests, surveys, interviews, or observation on 12/3/2020.

In conducting this protocol you are required to follow the requirements listed in the INVESTIGATOR MANUAL (HRP-103).

If any changes are made to the study, the IRB must be notified at [research.integrity@asu.edu](mailto:research.integrity@asu.edu) to determine if additional reviews/approvals are required. Changes may include but not limited to revisions to data collection, survey and/or interview questions, and vulnerable populations, etc.

Sincerely,

IRB Administrator

cc: [sonya golding](#)  
[sonya golding](#)

## Appendix D

### Provider Needs Assessment Questionnaire

Goal: To develop a process for the outpatient clinics to improve management of overweight and obese pediatric patients

1. How confident do you feel in your ability to manage pediatric overweight and obesity in the clinic? Circle your answer

0	1	2	3	4
Not at all confident	Not very confident	Somewhat confident	Very confident	Extremely confident

2. How many times have you avoided discussing pediatric overweight and obesity with the parent due to parent's apparent lack of interest or reluctance?

0	1	2	3	4
Never	Seldom	Occasionally	Often	Always

3. What are some barriers you experience in addressing pediatric weight management in the clinic? Circle all that apply

- a. Time
- b. Parent resistance
- c. Parents lack of follow-up
- d. Child/adolescent resistance
- e. Lack of referral resources to provide families
- f. Insurance Coverage
- g. Other \_\_\_\_\_

4. Which of the following could improve the care you deliver to overweight and obese children and adolescents in the clinic? Circle all that apply
- a. Multidisciplinary obesity team available in the clinic
  - b. List of guideline recommended laboratory tests to order located on the electronic health record
  - c. Availability of the Family Readiness to Change Questionnaire
  - d. Provision of a standardized pediatric obesity management algorithm
  - e. Referral list of affordable and accessible family weight management resources
5. What specific electronic medical record (EMR) changes do you think would assist you with pediatric obesity management in the clinic setting? (rank 1 = most important; 5 = least important)

		Ranking
a.	Pop up EMR list of ICD-10 codes related to overweight and obesity	
b.	Printable health lifestyle recommendations to give to families	
c.	Links to website provider and patient/parent resources on obesity management	
d.	Ability to refer patients to an in-house obesity management program	
e.	Ability to send follow-up appointment reminders concerning obesity management	

6. How often do you share the Air Force website as an obesity management educational resource with families?

0 Never	1 Seldom	2 Occasionally	3 Often	4 Always
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7. Beyond your medical or nursing training, have you had any additional pediatric weight management training? Circle all that apply
- a. Motivational interviewing
  - b. Behavior change skills building training
  - c. Nutritional education
  - d. Habit reversal training
  - e. Physical activity training
  - f. Other \_\_\_\_\_
  - g. Never had additional training
8. Once a child or teen is diagnosed with pediatric obesity, how long should the initial office visit be in order to assess the patient and develop a management plan? Circle your answer
- a. 20min
  - b. 30min
  - c. 40min
  - d. 50min
  - e. 60min
9. How much time is required for a follow-up telehealth or office visit for a child or teen with overweight or obesity once a management plan is developed? Circle your answer
- a. 15min
  - b. 20min
  - c. 25min
  - d. 30min
  - e. 60min

10. How frequently should an obese child or teen be reevaluated after the initial diagnosis?  
Circle your answer

- a. Once weekly
- b. Twice monthly
- c. Monthly
- d. Every 3 months
- e. Every 6 months
- f. Other \_\_\_\_\_

11. Have you considered any of the following options for improving patient/family adherence to treatment for overweight and obesity? Circle all that apply

- a. Telehealth (medical assistant, office nurse) appointments
- b. Telemedicine (MD, DO, NP, Psychologist)
- c. Phone call follow-up
- d. Text message reminders
- e. Referral to dietician
- f. Referral for nutritional therapy in another institution
- g. Patient portal education

12. Are you familiar with the Air Force Group Lifestyle Balance (GLB) Program for overweight and obese adults? Circle your answer

- a. Yes
- b. No

GLB program is based on a highly successful lifestyle intervention program originated at the University of Pittsburg for diabetes prevention. The military has since adapted and modified the program to fit the active duty member's needs. Trained lifestyle coaches guide adult individuals through a 12-month curriculum.

13. Would you be interested in referring children and adolescents if a similar program is developed for overweight and obese pediatric patients?

- a. Yes
- b. No

14. Which of the following additional resources would make your job easier in managing patients with obesity? Circle all that apply

- a. The Healthy Active Living for Families: Right From the Start project (HALF) is an Academy project that addresses early childhood obesity prevention by integrating the parent perspective and evidence-informed pediatric health guidance.
- b. Pediatric ePractice: Optimizing Your Obesity Care (PeP) is an innovative online tool designed to help prepare pediatric offices deliver effective prevention, assessment and treatment of childhood overweight and obesity.
- c. Healthy Growth App an interactive tool that gives care providers the unique ability to create custom handouts for parents on vital topics of healthy growth, nutrition, and physical activity for children 5 years of age and younger.
- d. The Importance of Addressing Weight-based Bullying with Your Pediatric Patients (Webinar)
- e. Healthychildren.org is an official parenting website created by the American Academy of Pediatrics, that provides pediatrician-approved child health resources

15. Circle any of the following available free/affordable community resources that you refer overweight and obese pediatric patients.

- a. Healthy Active Living for Families
- b. ChopChop Recipes
- c. Hungry Caterpillar Campaign "Eating Healthy, Growing Strong"
- d. None of the above
- e. Additional resource not listed above \_\_\_\_\_

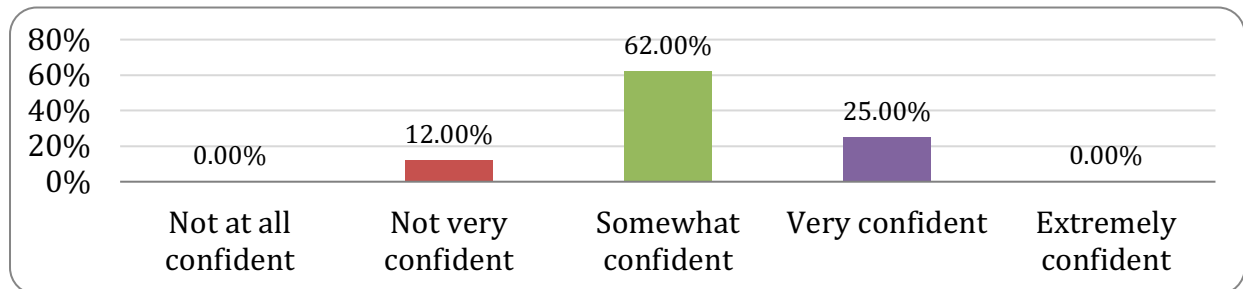
16. Considering the importance of maintaining a healthy military pediatric beneficiaries population in relation to the future strength of our Armed Forces, what other things have you considered for improving beneficiaries pediatric weight management care that was not mentioned above? \_\_\_\_\_

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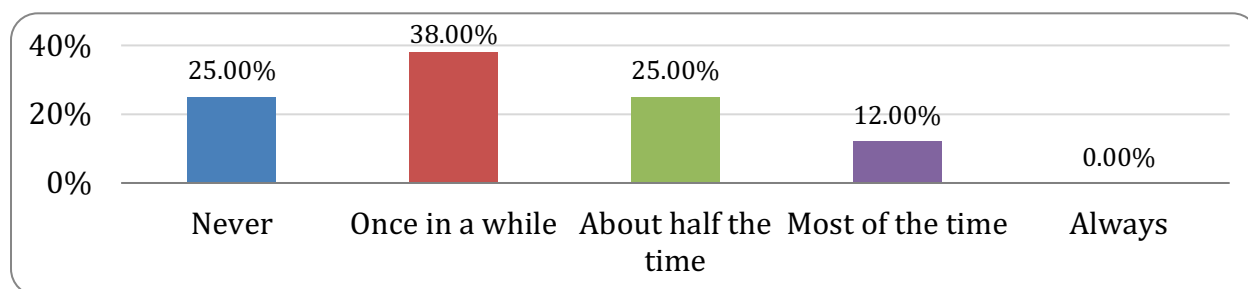
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**Appendix E****Results Figures and Tables****Figure E1.** Confidence in managing patient Q1

Mean: 3.125

**Figure E2.** Avoid discussion with parents Q2

Mean: 2.250

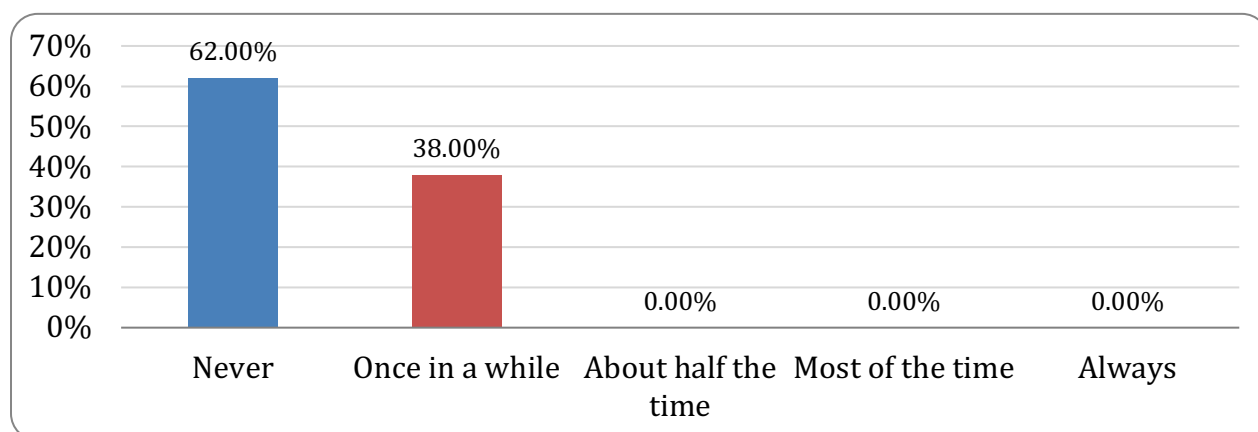
**Table E1.** Frequency Table for Q3

Variable	<i>n</i>	%
<b>Q3</b> provider reported barriers experienced in addressing pediatric weight management: Time		
No	1	12.50
Yes	7	87.50
Child resistance		
Yes	3	37.50
No	5	62.50
Parent resistance		
Yes	8	100.00
Lack of referral resources		
Yes	3	37.50
No	5	62.50
Lack of parent follow-up		
No	2	25.00
Yes	6	75.00
Insurance coverage		
Yes	1	12.50
No	7	87.50

**Table E2.** Frequency Table for Q4, Q5

Variable	<i>n</i>	%
<b>Q4</b> What would improve the care delivered?		
Multidisciplinary team		
No	1	12.50
Yes	7	87.50
list of recommended labs avail		
No	4	50.00
Yes	4	50.00
Family readiness to _change_ survey		
Yes	2	25.00
No	6	75.00
standardized algorithm		
No	3	37.50
Yes	5	62.50
referral _list_ of _resource		
No	1	12.50
Yes	7	87.50
<b>Q5</b> Provider reported EMR changes that can assist with obesity management? (Rank 1 = most important; 5 = least important)		
Pop-up ICD-10 code		
4	2	25.00
5	6	75.00
Printable lifestyle recommendation		
4	1	12.50
1	2	25.00
3	2	25.00
2	3	37.50
Links to helpful websites		
4	1	12.50
2	3	37.50
3	4	50.00
Access to in-clinic management program		
4	1	12.50
2	2	25.00

1	5	62.50
Variable	<i>n</i>	%
Ability to send f/u appointment reminders		
1	1	12.50
3	1	12.50
4	3	37.50
5	3	37.50

**Figure E3.** Frequency of referral to Tricare Website Q6

Mean: 0.38

**Figure E4.** Free-typed provider responses for improving pediatric weight

<b>Response ID</b>	<b>Response</b>
39674535	we need to dietician
39332303	Active Exercise Programs like a running club, learning to enjoy exercise
38583349	Referral to dietician and disease manager and
38296827	Nutritionist alone - Tricare does not pay for this option
38294417	Cooking classes for children and parents

**Table E3.** Frequency Table for Q7, Q8, Q9

Variable	<i>n</i>	%
<b>Q7</b> Additional weight management training		
Motivational interviewing		
No	2	25.00
Yes	6	75.00
Habit reversal training		
No	8	100.00
Behavioral change skills building		
Yes	1	12.50
No	7	87.50
Physical activity training		
No	8	100.00
Nutritional education		
Yes	2	25.00
No	6	75.00
Never had additional training		
Yes	2	25.00
No	6	75.00
<b>Q8</b> Suggested Length of initial office		
40minutes	3	37.50
30minutes	5	62.50
<b>Q9</b> Suggested length of follow up visit		
30 minutes	1	12.50
15 minutes	2	25.00
20 minutes	5	62.50



**Table E4.** Frequency Table for Q10, Q11, Q12, Q13

Variable	<i>n</i>	%
<b>Q10</b> frequency of follow-up after diagnosis		
Every 6 months	1	12.50
monthly	3	37.50
Every 3 months	4	50.00
<b>Q11</b> Improving family adherence Telehealth (select all that apply)		
yes	1	12.50
No	7	87.50
Telemedicine		
No	4	50.00
Yes	4	50.00
Phone call		
Yes	3	37.50
No	5	62.50
Text message		
Yes	1	12.50
No	7	87.50
Referral to dietician		
No	1	12.50
Yes	7	87.50
Referral for nutritional therapy		
No	3	37.50
Yes	5	62.50
Patient portal education		
Yes	1	12.50
No	7	87.50
<b>Q12</b> Familiar with GLBB military program?		
No	2	25.00
Yes	6	75.00
<b>Q13</b> Interested in referring GLBB for military kids if available?		
Yes	8	100.00

**Table E5.** Frequency table for Q14, Q15

Variable	<i>n</i>	%
<b>Q14</b> Resource that would make job easier: Healthy growth application		
No	4	50.00
Yes	4	50.00
<b>Q14</b> Pediatric ePractice-Provider educational tool		
No	3	37.50
Yes	5	62.50
<b>Q14</b> Healthy Growth App		
No	3	37.50
Yes	5	62.50
<b>Q14</b> Weight based Bullying webinar		
No	4	50.00
Yes	4	50.00
<b>Q14</b> Healthychildren.org		
Yes	2	25.00
No	6	75.00
<b>Q15</b> Free resourced used in management Healthy Active Living for Families:		
Yes	2	25.00
No	6	75.00
<b>Q15</b> None of the above		
No	4	50.00
Yes	4	50.00
<b>Q15</b> ChopChop recipes		
no	8	100.00
<b>Q15</b> Additional resource not listed above		
No	4	50.00
Yes	4	50.00
<b>Q15</b> Hungry Caterpillar Campaign		
No	8	100.00