

Improving Health Habits in Overweight Teens

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Author Note

Holly Cortes has no known conflict of interest to disclose.

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Abstract

The number of adolescents who are overweight are suffering from diseases once thought to only occur in adults, such as diabetes mellitus type 2, coronary heart disease, and liver disease with cases increasing exponentially. This may be correlated with adolescents making unhealthy choices in life resulting in depression in obese adolescents. Healthcare providers must continuously explore novel ways to empower teens to make healthy lifestyle changes. The Creating Opportunities for Personal Empowerment (COPE) Thinking, Emotions, Exercise, and Nutrition (TEEN) program was delivered to three adolescent participants in a primary care pediatric clinic in Southwest Arizona. The 15 sessions were provided weekly in the pediatrician's office using the COPE TEEN manual. The participants completed the HABITS questionnaire and the Patient Health Questionnaire-9 (PHQ-9) before starting the program and after program cessation and kept confidential. The survey results were compared using descriptive analysis and paired t-tests to analyze the data collected. Due to a small sample size (n=3), statistical significance could not be calculated. However, clinical significance was found as evidenced by lower depression scores and improvement in healthy habits. A cognitive behavior skills-building program such as the COPE TEEN program has the potential to empower adolescents to make healthy decisions in life. These healthy choices lead to a long, happy life free from diseases caused by unhealthy choices. This program positively impacts the clinical care of adolescents who are overweight or obese by offering providers an alternative manner of educating adolescents.

Keywords: adolescents, empower, healthy lifestyle, obese, overweight

Improving Health Habits in Obese Teens Using a Cognitive Skill-Building Program

Obesity in childhood and adolescence leads to lifelong struggles and potentially fatal diseases. Childhood obesity has grown to epidemic proportions worldwide and continues an upward trend (Cheung et al., 2016; Kumar & Kelly, 2017; Lange et al, 2021; Styne et al., 2017; Tyson & Frank, 2018; Wang et al., 2020). Overweight adolescents must be assessed and monitored regularly by their primary care provider to prevent obesity. A child's body mass index (BMI) is plotted using Centers for Disease Control and Prevention (CDC) growth charts which give a percentile; children over age two are considered obese if their BMI is above the 95th percentile for children of the same age and gender and overweight if the BMI is above the 85th percentile (CDC, 2019; Styne et al., 2017).

Problem Statement

In the United States (U.S.), approximately 32% of children and adolescents are overweight or obese, with mid-income and minority families reporting the highest rates (Lange et al., 2021; Fryar et al., 2021; Hales et al., 2017). In 2021, Lange et al. reported one out of every four Hispanic children and adolescents were obese, showing there is a steady increase in the rate of childhood obesity in the U.S. This population is at high risk of developing comorbidities such as diabetes, cardiovascular disease, metabolic syndromes, dyslipidemia, obstructive sleep apnea, liver disease, psychiatric disorders, and increased risk of cancer in adulthood (Chung et al., 2018; Rankin et al., 2016; Weihrauch-Bluher et al., 2019). Adolescents who weigh more than their peers suffer from low self-esteem, depression, anxiety, and other psychological problems (Rankin et al., 2016). These and the other comorbidities of obesity lead to excessive absences from school and poor performance, affecting their ability to succeed in life (Asirvatham et al.,

2019). Obesity and its comorbidities drive healthcare costs up, affecting millions of people nationwide (Cawley et al., 2021). The U.S. continues to spend billions of dollars to treat and manage obesity, a preventable disease. According to Cawley et al. (2021), approximately \$260 billion annually is directly attributed to the costs of obesity in the United States. These costs continue throughout the lifespan as most overweight and obese youth continue gaining weight through adulthood (Kumar & Kelly, 2017).

Purpose and Rationale

It is essential for healthcare providers to continually explore interventions to prevent obesity in teens and promote healthy lifestyle choices. Experts have predicted an increase in the prevalence of obesity in children and adolescents due to the covid-19 pandemic and are calling for primary care providers to closely monitor families and provide guidance to encourage healthy habits (American Academy of Pediatrics [AAP], 2020; An, 2020). The purpose of this project is to explore if using a program based on cognitive-behavioral therapy (CBT) to educate adolescents leads to the adoption of healthy habits and the prevention of obesity.

Background and Significance

Adolescents

Adolescents learn by watching people around them and absorbing the knowledge instilled in them as they develop themselves. Many overweight young people have parents or family members who share the same habits, such as excessive sedentary behavior, unhealthy diet choices, excessive screen time, and unhealthy sleep patterns that lead to obesity (Grant-Guimaraes et al., 2016). By choosing to adopt a healthy lifestyle at a young age, adolescents will most likely continue that trend as they get older.

Cognitive Behavioral Therapy

CBT helps individuals change their way of thinking about a topic and develop an individualized plan that can be maintained long term (APA, 2017). According to Wilfley et al. (2018), behavioral weight loss programs show promising results and improved health outcomes. This means that by using CBT as a guide to educate adolescents, the primary care practitioner can potentially prevent obesity and promote a lifelong adoption of healthy habits. Using CBT as an intervention to teach adolescents has the additional benefit of improving associated psychological problems such as depression or anxiety (APA, 2017).

Endocrine Society Clinical Practice Guideline

In 2017, the Endocrine Society released a clinical practice guideline to help practitioners assess, treat, and prevent pediatric obesity (Styne et al., 2017). In this guideline, it is recommended to use a comprehensive behavior-changing intervention strategy in schools and the community. Specific education topics include the types of foods children and adolescents should be consuming and avoiding, the amount of recommended activity, and sleep recommendations (Styne et al., 2017). Providers attempt to discuss nutrition and physical activity with teens during well-child visits, but this does not successfully adopt healthy habits.

Improved Health Habits

One of the goals of Healthy People 2030, carried over from Healthy People 2020, is to decrease the proportion of children and adolescents with obesity (Office of Disease Prevention and Health Promotion [ODPHP], n.d.). The issue of obesity in adolescents is not about the teen's weight but rather their health status. The hope is that by confronting this issue in youth, society

will learn to live healthier lifestyles, and obesity-related issues such as diabetes and heart disease would dramatically decrease.

Through the literature reviewed, obesity in young adults is an issue in the U.S. that is becoming worse and will continue through adulthood. Primary pediatric health care providers must continually look for innovative ways to improve health habits in adolescents. It is vital to include interventions that are aimed at providing long-term positive outcomes. These include behavior-changing interventions that will ensure adopting a healthy lifestyle, such as CBT-based health education.

Internal Evidence

In a primary care pediatric clinic located in Southwest Phoenix, Arizona, providers are concerned about the number of overweight and obese youth they see daily [Pediatric Nurse Practitioner (PNP), personal communication, October 15, 2020]. This clinic treats primarily Hispanic and non-Hispanic minority families and mid-to-low-income households on the state's Medicaid program. The PNP (personal communication, October 15, 2020) states the providers in this office speak with children, adolescents, and their families during their annual visits. Still, this information does not seem to change habits. Since the covid-19 pandemic started, children and adolescents are quarantined in their homes without going to school; providers have seen the obesity rate increase and are concerned. Interventions that encourage the adoption of healthy habits at home must be implemented. This inquiry has led to the PICO question: "In adolescents (P), how does cognitive behavioral therapy (CBT) based education (I) compare to traditional health education (C) affect the adoption of healthy habits (O)?"

Search Strategy

An exhaustive search was completed in the following databases to answer the PICO question: Cumulative Index of Nursing and Allied Health Literature (CINAHL), PsycINFO, and PubMed. These databases were chosen because they are known for their reliability and relevance to provide peer-reviewed articles that can be used to guide evidence-based health care. Keywords from each part of the PICO were used to search in each database and included Boolean phrases and MeSH terms. These keywords included: adolescents, youth, children, teenagers, young adults, cognitive behavior therapy (other spellings, including British *behavioural*), CBT, overweight, obesity, weight loss, weight management, health education, and treatment. Limitations were used, including articles between 2015 and 2021, full text available, a high level of evidence (LOE) including systematic reviews, meta-analyses, randomized control trials (RCT), and peer-reviewed articles.

CINAHL

The initial search in CINAHL included the Boolean phrase adolescents or teenagers or young adults or teen or youth and cognitive behavioral therapy or CBT or cognitive behavioural therapy (British spelling) and weight loss or weight reduction or lose weight or obesity or overweight or weight management. This search yielded 66 results, and after including the limitations, the result was 18 articles. The article titles and abstracts were screened, and three were chosen for further review. Seven were eliminated because they included adults, seven were not relevant to the intervention topic, and one was a duplicate.

PubMed

The initial search in PubMed, including the keywords adolescent, overweight, cognitive behavior therapy, and treatment resulted in 286 articles. Further limitations, including between

2015 and 2021, RCTs, systematic reviews, meta-analyses, and full text available, left 61 articles to be screened. After screening the articles' titles and abstracts, five articles were directly related to the topic and kept for further review.

PsycINFO

Keywords used in the initial search included adolescents or youth or children and behavior therapy or cognitive behavior therapy and obesity or overweight or obese produced 175 results, with limitations including after 2015 and peer-reviewed. Further limitations were applied, including articles written in English only, and yielded 46 articles. These articles' abstracts and titles were screened, and five were chosen to be more thoroughly reviewed.

Final Search Yield

A total of thirteen high-level articles were chosen for a comprehensive review. The reference lists in all articles led to another five pertinent articles, for a total of eighteen articles to be reviewed that are associated with using cognitive behavior therapy in overweight adolescents. Only articles in English, published since 2015, and high LOE were included. Most articles were clinical trials, systematic reviews, and meta-analyses.

Critical Appraisal & Synthesis of Evidence

Most of the studies reviewed were a high LOE according to tools for rapid critical appraisal developed by Melnyk & Fineout-Overholt (2019). All the articles reviewed were RCTs with a few systematic reviews published within the past five years (see Appendix A, Table A2). Most study participants were between the ages of thirteen and eighteen and an equal number of boys and girls. All RCTs were completed in an outpatient clinical setting or school, except one study completed inpatient (Warschburger & Zitzmann, 2019). All studies excluded participants

who had an underlying medical condition or taking medications that can cause increased weight gain.

There was a risk of bias in two articles because one of the authors of the study is the owner of the company used to provide the CBT program used (Hoying et al., 2015; Melnyk et al., 2015). Also, four out of ten studies used self-reported data, which has a high risk of bias. Although there was a risk of bias, all articles showed similar strengths, including using BMI as a measurable outcome, and all studies showed an improvement in patients participating in some form of CBT (see Appendix A, Table A2). Other positive outcomes included in most of the studies included improved mood, less screen time, healthy diet, increased physical activity, self-efficacy, and motivation.

The evidence clearly shows positive outcomes of using CBT in adolescents to improve health habits and decrease BMI. Using CBT measures, providers can provide health counseling to adolescents to increase their motivation to lead healthy lives. CBT-based counseling has been demonstrated to improve quality of life (QoL) scores and decreased depression when provided in clinical and school settings. According to Glanz et al. (2018), providers can promote positive behavior changes by advocating changes in the environment, social support, and reinforcement of healthy behavior. Adolescents learn health habits by observing the world around them. Further, support received from family members and friends around them strengthens the concepts taught.

Theory Application

Social Cognitive Theory (SCT), developed by Albert Bandura in 1986, applies to the health improvement outcomes derived from the literature review of the evidence (see Appendix

B, Figure 1). It is proposed that behavior change involves a continuous interaction between personal factors, environmental influences, and resultant behavior (Glanz et al., 2018). Examples of personal factors described include self-control and self-efficacy. Bandura (1986) describes self-efficacy as confidence in one's ability to act. This is an important concept for adolescents to achieve. Self-control is vital to improving health habits such as dietary intake and increased physical activity. Environmental influences include social support or barriers to change (Bandura, 1986). When providing health education to adolescents, family members and other support persons should also be included to increase the possibility of change. If adolescents seek to improve their diet habits, it is essential to have those around them support their endeavor and help them overcome any barriers they encounter along the way.

Implementation Framework

The Rosswurm & Larrabee Model is an evidence-based model used to guide practitioners to make practice changes (see Appendix B, Figure 2). There are six main steps in the model, from assessing the need for change to integration and maintenance of change (Rosswurm & Larrabee, 1999). Specific goals must be met in each step to progress to the next, and practitioners can move through these steps forward or backward across the continuum as needed. The first three steps include the assessed need for change, linking the problem with interventions and outcomes, and synthesizing the evidence (Rosswurm & Larrabee, 1999). A plan was made for the project with desired outcomes defined then the project was implemented. The data was collected, and outcomes were evaluated and presented to the project site. The next step will be for the site to decide if the program will be continued in the office. This is an appropriate model to guide change in practice, advancing from one step to the next in an organized fashion. If the

site does not wish to integrate the program, investigators can start from the first step to continually improve the education provided to adolescents.

Implications for practice change

The Creating Opportunities for Personal Empowerment (COPE) Thinking, Emotions, Exercise, and Nutrition (TEEN) Healthy Lifestyles Program was developed by Dr. Bernadette Melnyk to deliver skill-building strategies to adolescents 13-18 years of age (COPE, n.d.). The adolescents learn skills to cope with anxiety and stress in addition to nutrition and exercise skills. Several high-level studies show improved health habits in teens after completing the program, including two of the articles included in the comprehensive literature review (Hoying et al., 2015; Melnyk et al., 2015). These two RCTs were completed in school settings and provided by teachers. However, no studies found in the literature review show results of the COPE TEEN program completed in primary care practices.

With the overwhelming evidence found, showing improvements in depression and healthy lifestyles in adolescents participating in CBT programs, providers should use this strategy when counseling adolescents in the primary care pediatric clinic. The success of the COPE TEEN program is evident; therefore, this program should be provided in the clinic by trained health care providers.

Potential Outcomes

The COPE TEEN Healthy Lifestyles program seeks to empower adolescents to make healthy choices that will carry on with them into adulthood. CBT works best when the family is included in the plan of care, providing adolescents the support they need. Providing the counseling in a clinic ensures the parent/caregiver receives the same training as the adolescent.

This does not happen in a school setting. By providing healthy lifestyle counseling at this age, the prevalence of obesity should decrease in the coming years.

Methods

Population and Setting

The project took place in a primary care pediatric office located in Southwest Phoenix, AZ. This office cares for all children from birth to twenty-one years of age. Most of the patients in the clinic are from minority and low-income families. There is a total of four providers at the office, two medical doctors (MD) and two PNPs. This office is part of a larger corporation, which has several health clinics across Arizona. If this clinic finds the project successful and decides to adopt the program into the clinic, the affiliated offices may decide to use the program as well. This office strives to provide the best evidence-based care possible to all children served. The staff discuss resources available with parents, such as the women, infants, and children (WIC) program, but have limited resources for older children and adolescents (office staff, personal communication, February 2021). Providers in this office have stated the difficulty they encounter when discussing health habits with adolescents and are searching for unique ways to empower them to make healthy decisions (medical provider, personal communication, October 2020).

Other stakeholders in the project include adolescents, parents, and their families. Parents have long complained about the difficulty they have with their children not making healthy choices in life (medical provider, personal communication, October 2020). This program can improve the health habits of everyone in the home, starting with the teen participant. Support from parents and family is essential to success in this program. Insurance providers are also

considered stakeholders in this project, as it could lead to improved health of their covered clients and decreased costs. The intervention should empower participants to begin making healthy eating decisions that will carry them through to adulthood. When changes such as these are maintained through adulthood, the potential benefits include improved overall health and decreased healthcare costs frequently seen in obese adults (Kumar & Kelly, 2017; Robert Wood Johnson Foundation, 2020).

Intervention

This project evaluated if CBT-based education increased the adoption of healthy habits in overweight adolescents and improved depression scores. COPE TEEN training was completed by the graduate student to administer the fifteen-session program to participants. This training is available to medical and non-medical professionals, completed via the COPE website (cope2thrive.com), and a completion certificate valid for two years was issued. In addition to the certificate, the professional receives an instruction manual and participant manual used throughout the sessions. There is one manual for each participant they take home and bring to each session. After program completion, the participant keeps the manual for future reference.

The program is fifteen sessions that last approximately thirty to forty-five minutes each and can occur either once or twice a week (COPE, n.d.). Topics covered include setting goals, emotions, coping, nutrition, and physical activity (see Appendix E). The sessions were completed in an outpatient pediatric office. The participants' parents decided if they wanted to be in the room or not while completing the phases. Participants completed check-in with the front desk, like a regular medical visit, then waited in the waiting room until called back. The adolescent was called back to a private exam room by the graduate student. The first and last sessions included two questionnaires provided on a printed sheet of paper for the adolescents to

complete before starting the regularly scheduled session. BMI was not part of the data analysis because the adolescents were encouraged to focus on lifestyle changes, not on the number shown on the scale. To ensure privacy, the exam room door will always be closed.

Participants and Recruitment

Participants were recruited from the pediatric primary office where the sessions were completed. Fliers were placed in several areas throughout the office, including exam rooms and lobbies with brief information about the project and how to contact the student for more information. Providers in the office were briefed about the program and participant eligibility. Inclusion criteria include the following: overweight (per Centers for Disease Control and Prevention [CDC] guidelines >85% on the growth chart), a patient at the project site, age thirteen to eighteen years of age, not currently on medications that could cause increased weight or have a medical diagnosis that could cause weight gain, and must be able to read, write, and speak English fluently. Adolescents who have already completed the COPE TEEN program, see a mental health specialist outside of this practice, or do not have all the inclusion criteria mentioned were not eligible to participate.

Providers were encouraged to refer patients they thought could benefit from the program and were eligible. Once the practitioner identified a potential participant, the family was provided more information and contact information for the graduate student. Some families permitted the graduate student to contact them via the phone to provide further details about the COPE TEEN program.

Data Collection and Outcomes Measurement

Pre- and post-test questionnaires were used to assess baseline healthy habits and level of depression before starting the program and at completion. The two questionnaires include the HABITS questionnaire (see Appendix C) and the Patient Health Questionnaire-9 (PHQ9) (Kroenke et al., 2001; Wright et al., 2011). The PHQ9 asks questions relevant to mental health status, is already used regularly at the office, and will be used to evaluate the COPE portion of the COPE TEEN program (medical provider, personal communication, October 2020). Kroenke et al. (2001) found the PHQ9 screen to be valid and reliable, with a Cronbach's alpha score of 0.89. A strong association between PHQ9 scores and the level of dysfunction caused by depression was also reported (Kroenke et al., 2001). The HABITS questionnaire aligns well with the desired outcomes of the project and will be used to evaluate the TEEN portion of the program. Wright et al. (2011) found the HABITS questionnaire to be moderately valid and reliable, with a Cronbach's alpha score of 0.61. The HABITS questionnaire includes five brief questions using a Likert scale to evaluate nutrition and physical activity habits in the last month. According to Wright et al. (2011), a higher score indicates healthier habits, however instructions on how to score the items are not included. This questionnaire will be used to provide descriptive statistics in evaluating habits in adolescents before and after project participation. This tool can be used in the pediatric primary care setting to assess dietary and physical activity habits in children and adolescents (Wright et al., 2011).

Ethical Considerations

All information shared is kept confidential per HIPAA guidelines and the participant had the option to withdraw from the program at any time. All information including the process and any risks or benefits to the participant was provided verbally and written to the adolescent and their parent before they signed the informed consent form, without coercion from the provider or

student. This information and form had to be completed before starting the first session. All forms used in the project were written in English and at the 6th-grade level to ensure understanding. Participants and their families were encouraged to ask any questions that arose, and the student responded promptly, within twenty-four to forty-eight hours. All data collected from the sessions was scanned and stored in the university's encrypted cloud. Any paper documentation, including the questionnaires completed and any written notes or measurements, was shredded as soon as it was scanned to protect the participants' private information. This information is only accessible to the graduate student.

Approval was received from ASU's Institutional Review Board (IRB) before implementing the recruitment and intervention process. No funding or compensation was provided to the participants. The participants received a program manual that they worked on during the program and kept after the project. No funding was received to complete this project. The cost of recruitment materials and COPE training was paid for by the graduate student and the future budget for project sustainability was considered (see Appendix D).

Data Analysis

Data were analyzed using Intellectus Statistics (online computer software). Descriptive statistics were used to report the difference in individual questions on the questionnaires. Paired t-tests were used to compare the pre-and post-test questionnaire scores. According to Intellectus (2021), these were the most appropriate statistical tests to run because of the small sample size.

Results

Clinical significance was found for all measured outcomes; however, statistical significance was not available because of the small sample size. A total of four participants were

recruited and three (n=3) finished the program. All of them completed the pre-and post-questionnaires and all the program sessions. All were between the ages of 13 and 17 years old with an elevated BMI consistent with obesity, identified as Hispanic, and were on the state's Medicaid program. The gender of the participants is not revealed to keep their identity private.

Healthy Habits

An improvement in healthy habits was seen based on mean pre-and post-test scores of 21.6 and 25, respectively (see Table 1). Most (66%) reported decreased consumption of fast foods from more than twice a week to only once a week and a decreased consumption of junk food from more than twice a day to once or twice a week. Other topics with improvement included not skipping meals and decreased consumption of sugary beverages including juice and soda. All the participants (100%) reported drinking water regularly on both the pre-and post-test questionnaires.

There were some negative changes found as well for each adolescent. Some of these include decreased consumption of fruits and vegetables, decreased physical activity, and increased time watching television. There was one participant (33%) that reported each of these changes.

Table 1

Two-Tailed Paired Samples t-Test for the Difference Between TOTAL_PRE and TOTAL_POST

TOTAL_PRE		TOTAL_POST		<i>t</i>	<i>p</i>	<i>d</i>
<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
21.67	7.37	25.00	2.00	-0.96	.439	0.55

Note. N = 3. Degrees of Freedom for the *t*-statistic = 2. *d* represents Cohen's *d*.

Depression Level

All adolescents reported a decrease in depression levels with the mean score decreasing from 12.67 to 9.33 (see Table 2). All of them reported fewer days of feeling down, depressed, or hopeless, and most (66%) reported less trouble concentrating. Other questions with at least one person stating an improvement included the number of days feeling bad about themselves, restlessness, little interest in doing things, and trouble sleeping. Two of the adolescents (66%) had negative changes including increased days with little interest in doing things and feeling tired or little energy.

One of the participants had a relatively high score on the PHQ9 and was referred to the primary care physician (PCP) for assessment. The graduate student discussed this with the provider and the adolescent's parent, and after it was determined they were not in danger of hurting themselves or anyone else, everyone decided it was safe to continue with the program. The teen's safety was monitored regularly by family, the graduate nurse student, and the provider. In addition, the sessions were all completed while a licensed medical provider was on-site and available for consultation as needed.

Table 2

Two-Tailed Paired Samples t-Test for the Difference Between Total_Pre and Total_Post

Total_Pre		Total_Post		<i>t</i>	<i>p</i>	<i>d</i>
<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
12.67	8.14	9.33	9.29	2.50	.130	1.44

Note. N = 3. Degrees of Freedom for the *t*-statistic = 2. *d* represents Cohen's *d*.

Limitations

There were a few limitations found with this project. One of the biggest limitations is the length of the project intervention. The program required the adolescents and parents to commit to coming to the clinic every week. This was difficult because of school/work schedules, illness, or vacations. Despite the difficulty in coordinating schedules, all the adolescents lived in the same area and the school schedules aligned giving the ability to schedule all three participants to come into the clinic on the same day of the week. The project was completed during the coronavirus pandemic, including prolonged quarantine restrictions making scheduling more difficult. The graduate student offered to complete the sessions virtually via the Zoom platform, but the participants and parents declined and stated they prefer to come in person. Due to time constraints and the length of the program, recruitment was only done for a few weeks. This led to a substantially smaller sample size.

Sustainability

The graduate student first began to read about the cognitive skills-building program after completing clinical practice hours with one of the providers. The PNP already delivers the seven-session COPE program at the practice and reported seeing improvement in depression scores via the PHQ9. Providers can bill for each session of the COPE TEEN program and receive reimbursement. According to the office staff member (personal communication, 15 October 2020), the office receives approximately \$90 for each session. The results from the project will be disseminated to the office providers and it is hoped that the program can be utilized at the corporation's sister offices around the valley. The graduate student received a license to deliver the program that is good to use for two years, therefore the program can be continued at any location the student practices after graduation. In addition, other providers at the office can also be trained and licensed to provide the service. This program can also be used in other settings as

well. Teachers or community workers can receive training and deliver the program to groups of adolescents in community centers, religious institutions, schools, etc.

Discussion and Project Impact

These results show an overall improvement in both depression scores and healthy habits through counseling on lifestyle modifications using a cognitive skill-building program. Providers can use this information to help inform how adolescents can be empowered to make these changes on their own, without feeling pressure from those around them. Parents expressed to the graduate student the pride they felt that their child was finally taking control of their habits and becoming more independent. One parent shared an experience they had with the teen that chose to have fruit as a snack from the convenience store instead of the chips and candy selected by the younger sibling and parent. Each week, the participants were encouraged to say positive self-statements and make goals for themselves. This may have had an impact on all of them reporting fewer days feeling down and depressed.

The outcomes from this project are like those seen in the other studies where the program was delivered in the school setting. Future studies should be completed to further evaluate the effectiveness of the program when delivered in the primary care setting. The teens practiced skills taught throughout the week and the nutrition and physical activity logs were reviewed with the graduate student at each session. This close follow-up and monitoring could have had an impact on the outcomes. More studies should be completed to further investigate the effectiveness of keeping activity logs and close follow-up appointments to continuously encourage young people to stay focused on healthy living.

References

- American Academy of Pediatrics. (2020). *Obesity management and treatment during covid-19*. Retrieved February 12, 2021, from <http://services.aap.org/en/pages/2019-novel-coronavirus-covid-19-infections/clinical-guidance/obesity-management-and-treatment-during-covid-19/>.
- American Psychological Association. (2017). *What is cognitive behavioral therapy?* Retrieved February 11, 2021, from <https://www.apa.org/ptsd-guideline/patients-and-families/cognitive-behavioral>.
- An, R. (2020). Projecting the impact of the coronavirus disease-2019 pandemic on childhood obesity in the United States: A microsimulation model. *Journal of Sport and Health Science*, 9(4), 302–312. <https://doi.org/10.1016/j.jshs.2020.05.006>
- Asirvatham, J., Thomsen, M. R., & Nayga, R. M. (2019). Childhood obesity and academic performance among elementary public-school children. *Educational Research*, 61(1), 1–21. <https://doi.org/10.1080/00131881.2019.1568199>
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Prentice-Hall.
- Baños, R. M., Oliver, E., Navarro, J., Vara, M. D., Cebolla, A., Lurbe, E., Pitti, J. A., Torró, M. I., & Botella, C. (2019). Efficacy of a cognitive and behavioral treatment for childhood obesity supported by the ETIOBE web platform. *Psychology, Health & Medicine*, 24(6), 703–713. <https://doi.org/10.1080/13548506.2019.1566622>
- Cawley, J., Biener, A., Meyerhoefer, C., Ding, Y., Zvenyach, T., Smolarz, B. G., & Ramasamy, A. (2021). Direct medical costs of obesity in the United States and the most populous

- states. *Journal of Managed Care & Specialty Pharmacy*, 27(3), 354–366. DOI: 10.18553/jmcp.2021.20410
- Cheung, P. C., Cunningham, S. A., Naryan, K. M. V., & Kramer, M. R. (2016). Childhood Obesity Incidence in the United States: A Systematic Review. *Childhood Obesity*, 12(1), 1–11. <https://doi.org/10.1089/chi.2015.0055>
- Chung, S. T., Onuzuruike, A. U., & Magge, S. N. (2018). Cardiometabolic risk in obese children. *Annals of the New York Academy of Sciences*, 1411(1), 166–183. <https://doi.org/10.1111/nyas.13602>
- Centers for Disease Control and Prevention. (2019, July 24). *Defining childhood obesity*. <https://www.cdc.gov/obesity/childhood/defining.html>
- COPE. (n.d.). *Creating opportunities for personal empowerment*. <https://www.cope2thriveonline.com>
- Fryar CD, Carroll MD, & Afful J. (2021). Prevalence of overweight, obesity, and severe obesity among children and adolescents aged 2–19 years: United States, 1963–1965 through 2017–2018. *NCHS Health E-Stats*. https://www.cdc.gov/nchs/data/hestat/obesity_child_15_16/obesity_child_15_16.pdf
- Glanz, K., Burke, L.E., & Rimer, B.K. (2018). Health behavior theories. In J.B. Butts & K.L. Rich (Eds.), *Philosophies and theories for advanced nursing practice*. (3rd ed., pp. 241–265).
- Grant-Guimaraes, J., Feinstein, R., Laber, E., & Kosoy, J. (2016). Childhood overweight and obesity. *Gastroenterology Clinics of North America*, 45(4), 715–728. <https://doi.org/10.1016/j.gtc.2016.07.007>

- Hales, C. M., Carroll, M.D., Fryar, C.D., & Ogden, C.L. (2017). *Prevalence of Obesity Among Adults and Youth: United States, 2015–2016*. (National Center for Health Statistics Data Brief No. 288). Centers for Disease Control and Prevention.
- Hoying, J., Melnyk, B. M., & Arcoleo, K. (2016). Effects of the COPE cognitive behavioral skills building TEEN program on the healthy lifestyle behaviors and mental health of Appalachian early adolescents. *Journal of Pediatric Health Care*, 30(1), 65–72.
<https://doi.org/10.1016/j.pedhc.2015.02.005>
- Kumar, S., & Kelly, A. S. (2017). Review of Childhood Obesity. *Mayo Clinic Proceedings*, 92(2), 251–265. <https://doi.org/10.1016/j.mayocp.2016.09.017>
- Lange, S.J., Kompaniyets, L., Freedman, D. S., Kraus, E. M., Porter, R., Blanck, H. M., & Goodman, A. B. (2021). Longitudinal trends in body mass index before and during the COVID-19 pandemic among persons aged 2–19 Years — United States, 2018–2020. *MMWR. Morbidity and Mortality Weekly Report*, 70(37), 1278–1283.
<https://doi.org/10.15585/MMWR.MM7037A3>
- Melnyk, B. M., Jacobson, D., Kelly, S. A., Belyea, M. J., Shaibi, G. Q., Small, L., O’Haver, J. A., & Marsiglia, F. F. (2015). Twelve-month effects of the COPE Healthy Lifestyles TEEN Program on overweight and depressive symptoms in high school adolescents. *Journal of School Health*, 85(12), 861–870. <https://doi.org/10.1111/josh.12342>
- Melnyk, B. M., & Fineout-Overholt, E. (2019). *Evidence-based practice in nursing and healthcare: A guide to best practice* (4th ed.). Wolters Kluwer.
- Office of Disease Prevention and Health Promotion. (n.d.). Overweight and obesity. *Healthy People 2030*. U.S. Department of Health and Human Services.

<https://health.gov/healthypeople/objectives-and-data/browse-objectives/overweight-and-obesity>

- Ogden, C. L., Carroll, M. D., Fakhouri, T. H., Hales, C. M., Fryar, C. D., Li, X., & Freedman, D. S. (2018). Prevalence of Obesity Among Youths by Household Income and Education Level of Head of Household—United States 2011–2014. *MMWR. Morbidity and Mortality Weekly Report*, 67(6), 186–189. <https://doi.org/10.15585/mmwr.mm6706a3>
- Rankin, J., Matthews, L., Copley, S., Han, A., Sanders, R., Wiltshire, H. D., & Baker, J. S. (2016). Psychological consequences of childhood obesity: Psychiatric comorbidity and prevention. *Adolescent Health, Medicine and Therapeutics*, 7, 125–146. <https://doi.org/10.2147/AHMT.S101631>
- Rosswurm, M.A. & Larrabee, J.H. (1999). A model for change to evidence-based practice. *Journal of Nursing Scholarship*, 31(4), 317-322. <https://doi.org/10.1111/j.1547-5069.1999.tb00510.x>
- Styne, D. M., Arslanian, S. A., Connor, E. L., Farooqi, I. S., Murad, M. H., Silverstein, J. H., & Yanovski, J. A. (2017). Pediatric Obesity—Assessment, Treatment, and Prevention: An Endocrine Society Clinical Practice Guideline. *The Journal of Clinical Endocrinology & Metabolism*, 102(3), 709–757. <https://doi.org/10.1210/jc.2016-2573>
- Tyson, N., & Frank, M. (2018). Childhood and adolescent obesity definitions as related to BMI, evaluation, and management options. *Best Practice & Research Clinical Obstetrics & Gynaecology*, 48, 158–164. <https://doi.org/10.1016/j.bpobgyn.2017.06.003>
- Wang, Y., Beydoun, M. A., Min, J., Xue, H., Kaminsky, L. A., & Cheskin, L. J. (2020). Has the prevalence of overweight, obesity, and central obesity leveled off in the United States? Trends, patterns, disparities, and future projections for the obesity epidemic.

International Journal of Epidemiology, 49(3), 810–823.

<https://doi.org/10.1093/ije/dyz273>

Weihrauch-Blüher, S., Schwarz, P., & Klusmann, J.-H. (2019). Childhood obesity: Increased risk for cardiometabolic disease and cancer in adulthood. *Metabolism*, 92, 147–152.

<https://doi.org/10.1016/j.metabol.2018.12.001>

Wilfley, D. E., Hayes, J. F., Balantekin, K. N., Van Buren, D. J., & Epstein, L. H. (2018). Behavioral interventions for obesity in children and adults: Evidence base, novel approaches, and translation into practice. *The American Psychologist*, 73(8), 981–993.

<https://doi.org/10.1037/amp0000293>

Wright, N. D., Groisman-Perelstein, A. E., Wylie-Rosett, J., Vernon, N., Diamantis, P. M., & Isasi, C. R. (2011). A lifestyle assessment and intervention tool for pediatric weight management: The HABITS questionnaire. *Journal of Human Nutrition and Dietetics*, 24(1), 96–100. <https://doi.org/10.1111/j.1365-277X.2010.01126.x>

Appendix A

Evaluation and Synthesis Tables

Table A1

Evaluation Table Quantitative Studies

Citation	Theoretical/ Conceptual Framework	Design/ Method/ Purpose	Sample/Setting	Variables	Measurement/ Instrumentation	Data Analysis	Results/ Findings	Level of Evidence; Application to practice/ Generalization
(Baños et al., 2019). Efficacy of a cognitive and behavioral treatment for childhood obesity supported by the ETIOBE web platform. Country: Spain	SCT	Design: pre-treatment/post-treatment with randomly assigned groups (Quasi-experimental) Purpose: analyze and compare efficacy of CBT and CBT with	N= 47 Demographics: Not described other than age range 8-12 years Setting: hospital-outpatient Inclusion: age 8-12 years old; Spanish	IV1: CBT IV2: CBT-E DV1: AM-BMI z-score; fat mass; relative lean mass DV2: self-efficacy DV3: motivation	AM using Tanita Scale BMI % and z-score Self-efficacy questionnaire Motivation questionnaire	ANOVA Descriptive statistics	Significant difference in: BMI z-score (p<0.001) Fat mass (p<0.05) Lean mass (p<0.001). No significant difference seen between CBT and CBT-E in	LOE: III Strengths: improvements seen in AM, eating habits, PA in both groups supporting other reviewed studies' results that CBT with family support are effective Limitations: small sample

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Citation	Theoretical/ Conceptual Framework	Design/ Method/ Purpose	Sample/Setting	Variables	Measurement/ Instrumentation	Data Analysis	Results/ Findings	Level of Evidence; Application to practice/ Generalization
<p>Funding: MICINN; PROMETEO (*no explanation of what this stands for); CIBER Fisiopatologia de la Obesidad y Nutricion; Spanish government; Ministry of Economy and Competitiveness; Ministry of Education</p> <p>Bias: self- reported questionnaires used</p>		<p>computerized support</p>	<p>speaking; ability to go to clinic; BMI > 85% Exclusion: presence of medical condition that can cause increase in weight or inability to participate in PA; eating disorder or other MI</p> <p>Attrition: not disclosed</p> <p>Definitions: obesity</p>				<p>BMI z- scores, fat mass, and lean mass (p>0.05). No significant difference seen in self- efficacy and motivation; although improved in both groups, it was not a significant improvement (p>0.05).</p>	<p>size; no demographic or attrition rate reported; technical issues with ETIOBE; long-term follow up needed</p> <p>Feasibility: children do well with internet and computerized programs; both CBT and CBT-E had active family members during interventions; Spain study, not U.S.</p>

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Citation	Theoretical/ Conceptual Framework	Design/ Method/ Purpose	Sample/Setting	Variables	Measurement/ Instrumentation	Data Analysis	Results/ Findings	Level of Evidence; Application to practice/ Generalization
<p>(Cheung et al., 2016). Childhood obesity incidence in the U.S.: an SR</p> <p>Country: U.S.</p> <p>Funding: Eunice Kennedy Shriver National Institute of Child Health & Human Development</p> <p>Bias: None</p>	<p>PRISMA model</p>	<p>Design: SR using PRISMA guidelines</p> <p>Purpose: Systematically review studies to estimate the incidence of obesity in the U.S.</p>	<p>N= 19 articles</p> <p>Demographics: all races, ages 0-18 years; several studies reviewed reported income and race.</p> <p>Setting: schools, clinics, community centers</p> <p>Inclusion: in English; primary or secondary data; from the U.S.; provided estimates of obesity incidence in</p>	<p>IV1: articles/studies reporting incidence of obesity from childhood to adolescence in the U.S.</p> <p>DV1: Age-specific obesity incidence</p> <p>DV2: Obesity incidence by demographics and baseline wt.</p> <p>Definitions: obesity</p>	<p>Searched literature in PubMed, EMBASE, CINAHL, & the Web of Science tool</p> <p>Reference lists hand searched.</p>	<p>Height, weight using scale</p> <p>Some studies used parent-report of AM</p> <p>Many studies used secondary data sets: PedNSSS</p>	<p>DV1: median annual incidence: Infants 4% Preschool 4% School-age 3.2% Adolescents 1.8%</p> <p>DV2: socioeconomically disadvantaged or >50% racial minority groups: 0-1.9 yr. 4% 2-4.9 yr. 4/1% 5-12.9 yr. 4/4%</p>	<p>LOE: I</p> <p>Strengths: literature review, even with heterogeneity in populations, showed a theme of increased incidence of childhood obesity, mostly in younger children.</p> <p>Limitations: designs, measurements, locations varied widely between studies; convenience data used; large heterogeneity between studies.</p> <p>Feasibility: only 3 studies included in the SR used nationally</p>

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Citation	Theoretical/ Conceptual Framework	Design/ Method/ Purpose	Sample/Setting	Variables	Measurement/ Instrumentation	Data Analysis	Results/ Findings	Level of Evidence; Application to practice/ Generalization
			children age 0-18 years Exclusion: clinically defined populations, such as dx or medication				13-18 yr. 2.2% Overall incidence greater in younger children than adolescents. Incidence greater in socioeconomically disadvantaged and minority groups.	represented data, so the results could be skewed
(Hoying et al., 2015). Effects of the COPE Cognitive Behavioral Skills	SCT	Design: one group pre/posttest pre-experimental	Sample Size: 24 Attrition rate: 24/29 (83%)	IV: CBT (COPE TEEN program)	HLBS BYI-II	Descriptive statistics Paired t-tests	Significantly improved self-concept (p= 0.001)	LOE: III Strengths: scales measure several aspects of COPE

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Citation	Theoretical/ Conceptual Framework	Design/ Method/ Purpose	Sample/Setting	Variables	Measurement/ Instrumentation	Data Analysis	Results/ Findings	Level of Evidence; Application to practice/ Generalization
<p>Building TEEN Program on the Healthy Lifestyle of Appalachian Early Adolescents.</p> <p>Location: Midwest</p> <p>Funding: NIH</p> <p>Bias: One of the authors owns the company, COPE2THRIVE, which distributes the COPE program</p>		<p>(quasi-experimental)</p> <p>Purpose: Investigate if positive effects of the COPE TEEN program seen in Appalachian early adolescents in middle school settings</p>	<p>Demographics: 13-14 years old; 48% males; 52% females; 100% white; 48% low income; 14 normal weight at baseline, 5 overweight, & 9 obese</p> <p>Setting: middle school</p> <p>Inclusion: enrolled in 8th grade health class at the middle school; speak and comprehend English</p>	<p>DV: healthy lifestyle behaviors</p> <p>DV: anxiety</p> <p>DV: depression</p> <p>DV: self-concept</p> <p>DV: BMI</p>	<p>AM via SECA scale</p> <p>BMI</p>	<p>Reliability calculated with Cronbach's α</p>	<p>Significantly improved anger (p=0.032)</p> <p>Overall improved anxiety, depression, and disruptive behavior.</p> <p>Slight improvement seen on HLBS</p>	<p>TEEN program, not only weight/AM</p> <p>Weakness: BMI reduction not reported (states not significant, but unknown value), due to length of study (1 school semester)</p> <p>Limitations: no control group; assessment of short-term outcomes; not generalizable (only 25% of total population participated); CBT performed by teacher, not HCP</p> <p>Feasibility: This study showed feasible to</p>

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			Definitions: Overweight Obese					complete in a middle school health education course
(Jelalian et al., 2019). CBT plus healthy lifestyle enhancement for depressed, overweight/obese adolescents: results of a pilot trial. Country: Northeast U.S. Funding: National Institute of Mental Health	CBT/SCT	Design: RCT, pilot trial Purpose: test the feasibility of using CBT and healthy lifestyle integrated interventions in a sample of depressed, overweight/obese adolescents.	N= 33 Demographics: Mostly females (~70% in each group); mid-income; 50% minority races Setting: inferred to be a clinic-not disclosed Inclusion: 13-18 yr.; current major depression or dysthymia; CDRS ≥ 65;	IV1: CBT IV2: CBT-HL DV1: acceptability based on evaluation form DV2: depression scores DV3: BMI DV4: time spent in MVPA DV5: sedentary time	CDRS Clinical Global Impairment-Severity of Illness scale Cognitive Therapy Rating Scale AM via SECA scale SenseWear Mini to monitor PA BYI-II	Generalized linear random effects growth curve model	CBT group attended significantly more CBT sessions than CBT-HL group (p<0.001) Both groups showed a decline in depression scores, that continued through 48 week follow up.	LOE: IV Strengths: randomized allocation to groups; short term and long-term outcomes reported; therapists and assistants were trained prior to intervention and sessions were recorded. Limitations: small sample size; missing data; equipment failure; low and varied attendance to sessions

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Bias: none.			BMI > 25 or BMI% > 85% Exclusion: bipolar or psychosis dx; meds that impact weight; if on meds, must be stable minimum 3 months Attrition: 100%	Definitions: CBT group only focused on depressed mood vs CBT-HL group focused on PA, nutrition, and mood	Kiddie Schedule for Affective Disorders and Schizophrenia Present Session evaluation form		Weight decrease shown in CBT-HL group and small increase in BMI seen in CBT group. Only short- term increase in MVPA seen in CBT- HL group.	Feasibility: since low attendance seen in the CBT-HL group, this could be because it was too many sessions to go to (CBT and exercise classes). Despite this, a decline in depression scores shows exercise helps decrease depression and weight.
(Melnik et al., 2015). Twelve-month effects of the COPE Healthy Lifestyles TEEN Program on	SCT/CBT	Design: cluster RCT Purpose: evaluate long term efficacy of the COPE	N= 779 Demographics: 14-16 yr.; mostly females (>50%); 2/3	IV1: COPE program IV2: Healthy Teens program (control)	Pedometer Manual/ homework guide for each intervention	ANCOVA	Significant decrease in proportion of overweight/o bese teens in COPE	LOE: II Strengths: cost- effective by using teachers and courses already in use at the

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<p>overweight and depressive symptoms in high school adolescents.</p> <p>Country: Southwest U.S.</p> <p>Funding: NIH/ National Institutes of Nursing Research</p> <p>Bias: One of the authors owns the company, COPE2THRIVE, which distributes the COPE program</p>		<p>HL TEEN program</p>	<p>self-identified as Hispanic</p> <p>Setting: high schools</p> <p>Exclusion: no parental consent; non-English speaking</p> <p>Attrition: 80% completed all follow ups at 15 weeks, 6 months, and 12 months</p>	<p>DV1: BMI</p> <p>DV2: Depressive symptoms</p> <p>Other outcomes: time watching TV; PA</p>	<p>Parent newsletters</p> <p>AM using stadiometer and Tanita scale</p> <p>BYI-II</p>		<p>program (p=0.02).</p> <p>Significantly lower BMI seen in COPE group (p=0.001)</p> <p>High-income COPE participants had lower BMI values at 12 months.</p> <p>COPE teens had significantly lowered depression scores compared to</p>	<p>schools so no need to hire new staff</p> <p>Limitations: self-reported depression; only 50% of those eligible participated; no assessment of MI treatment outside of school; decreased fidelity by teachers providing intervention</p> <p>Feasibility: easy program to implement remotely- program training is online; Southwest region; adolescents only</p>

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							Healthy Teens group (p=0.03).	
(Miri et al., 2019). Effectiveness of CBT on nutrition improvement and weight of overweight and obese adolescents: An RCT. Country: Iran Funding: not disclosed Bias: self-reported outcomes via questionnaires	CBT/SCT	Design: RCT Purpose: Assess the effect of CBT on weight reduction in overweight and obese adolescents	N= 110 Demographics: children 13-18 years old; equal boy: girl in each group Setting: 4 different pediatric offices Exclusion: medical causes of obesity including meds Pregnant Mental health dx	IV: CBT IV: TAU DV: BMI DV: AM DV: body fat	CDSS WEL PES PedsQL Food diary YAFFQ SECA scale	Shapiro-Wilk test Chi square test Independent t-tests ANCOVA	Significant improvement in dietary and AM (p<0.001) BMI, body fat all improved (p<0.005)	LOE: II Strengths: randomized, controlled Weakness: unable to blind; self-reported outcomes; puberty status may have a factor; participants recruited at doctor office, may have more motivation than in the community. Feasibility: Study was completed in Iran, not in the U.S., however study could be easily

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Citation	Theoretical/ Conceptual Framework	Design/ Method/ Purpose	Sample/Setting	Variables	Measurement/ Instrumentation	Data Analysis	Results/ Findings	Level of Evidence; Application to practice/ Generalization
			Attrition: all completed the study; 8 lost to follow up					replicated in any country or setting.
(O'Connor et al., 2017). Screening for obesity and intervention for weight management in children and adolescents: evidence report and systematic review for the US Preventative Services Task Force. Country: U.S.	Analytic framework	Design: Evidence report and SR Purpose: review benefits and harms of screening and treatment for obesity and overweight in children and adolescents to inform the U.S. Preventative	N= 464 articles reviewed Demographics: age 2-18 yr. Setting: health care settings Exclusion: not relevant; not conducted in right setting- in U.S. and/or health care setting; no control group;	IV1: Lifestyle-based interventions IV2: Metformin IV3: Orlistat DV1: BMI DV2: Hours of contact DV3: QoL	Searched literature in PubMed, PsycINFO, Cochrane registry of RCTs, and Education Resources Information Center Reference lists hand searched. Government websites.		Reduction in excess wt.: lifestyle modification interventions >26 contact hours reduced excess wt. and BMI. Behavior-based interventions with few contact hours showed limited	LOE: I Strengths: only RCT completed in the U.S. and were reviewed; Tables summarizing results from review Limitations: no evidence related to benefits or harms of screening for obesity minimal long term follow up beyond 12 months; small sample sizes; sparse reporting of health outcomes;

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Citation	Theoretical/ Conceptual Framework	Design/ Method/ Purpose	Sample/Setting	Variables	Measurement/ Instrumentation	Data Analysis	Results/ Findings	Level of Evidence; Application to practice/ Generalization
<p>Funding: AHRQ; U.S. Department of Health and Human Services</p> <p>Bias: None; authors reported contributions from funding agencies and included developing the key questions.</p>		Services Task Force	not right population				<p>benefit, however, may be more effective in children/adolescents who are overweight and not obese.</p> <p>No evidence of harm from lifestyle modification interventions.</p> <p>Metformin or orlistat use only showed small reduction in excess wt.</p>	<p>high variability in results makes it difficult to interpret average effects; inconsistent reporting; heterogeneity in population, study, and intervention characteristics</p> <p>Feasibility: This SR can help primary care providers understand what interventions are best based on the population they serve and since the studies were all in the U.S., this is generalizable nationwide, not only in one region.</p>

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Citation	Theoretical/ Conceptual Framework	Design/ Method/ Purpose	Sample/Setting	Variables	Measurement/ Instrumentation	Data Analysis	Results/ Findings	Level of Evidence; Application to practice/ Generalization
							Significant improvement seen in cardiometabolic measures in children with lowered BMI due to family-based behavioral weight management interventions.	
(Pbert et al., 2016). A school-based program for overweight and obese adolescents: an RCT	SCT	Design: cluster RCT Purpose: test school-delivered weight management	N= 126 Demographics: mostly female, Caucasian; intervention group had more mixed races than control group	IV1: school-based program: “Lookin’ Good Feelin’ Good” (intervention) IV2: information	AM WC Tanita Scale Interactive NDS	Reliability of instruments calculated with Cronbach’s α T-tests Chi-square	No significant difference between groups for: BMI (p= 0.731)	LOE: II Strengths: randomization; large sample w/ 100% retention Weakness: both intervention and

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<p>Country: US</p> <p>Funding: NIH, NHLBI; equipment loaned from RWJF</p> <p>Bias: self-reported measures of behavior change</p>		<p>counseling program</p>	<p>Setting: high school</p> <p>Inclusion: 9-12 grade; BMI > 85th %</p> <p>Exclusion: plans to move; medical condition/illness; MI; medical cause of obesity; meds causing weight gain; weight ≥ 300lb</p> <p>Attrition: 100%</p>	<p>only provided (control)</p> <p>DV1: BMI DV2: % BF DV3: WC DV4: # of servings of fruits/vegetables in past week DV5: # of days breakfast eaten in past week DV6: # times soda drank in last 7 days DV7: # times fast food was eaten in past week</p>	<p>STC-diet assessment</p> <p>ActiGraph Model to measure PA</p> <p>YRBS</p> <p>Go Girls study questionnaire</p> <p>New Moves questionnaire</p> <p>Self-reported rating scale of program</p>	<p>Mixed-effects regression models</p>	<p>% BF (p= 0.281)</p> <p>WC (p= 0.693)</p> <p>Significant findings (p<0.05): Number of days breakfast is eaten (p= 0.024).</p> <p>Number of days PA (p= 0.007)</p>	<p>control groups had one on one meetings with the school nurse; perhaps if the control group had what is considered usual care, there would have been more of a difference seen; poor participation in PA part of the intervention.</p> <p>Feasibility: counseling by school nurse is feasible and was well accepted by adolescents Exercise program only achieved 50% participation and therefore is not as</p>

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				DV8: Screen time/# hours in past week DV9: # days PA in past week DV10: # days MVPA in past week DV11: Total calories (energy)				feasible for various reasons.
(Wang et al., 2015). What childhood obesity prevention programmes work? An SR and MA. Location: Several high-income countries	Inferred: mix of CBT, transtheoretical model, SCT	Design: SR and MA Purpose: systematically evaluate effectiveness of childhood obesity prevention programs	N= 147 articles (139 studies) Demographics: children age 2-18 years old Setting: school, home, community, primary care, daycare	IV: evaluation of interventions to prevent obesity DV: children aged 2-18 years	Searched literature in MEDLINE, EMBASE, PsycINFO, CINAHL, & Cochrane Library	BMI BMI z-scores BMI percentile WC %BF	Majority of interventions are in the U.S. and in school settings, which show moderate effectiveness. More research is	LOE: 1 Strengths: interventions were studied over an extended period of time- either 1 year or (in school settings) 6 months; systematic and rigorous search

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(US and others not specifically mentioned) Funding: US-AHRQ and NIH Bias: None			Inclusion: RCT, quasi-experimental studies, natural experiments			Skin-fold thickness Prevalence of overweight or obesity	needed in non-school settings because the articles found had a high risk of bias or had conflicting results. Home and family inclusion is important.	Weakness: few studies reviewed cost effectiveness of the interventions Limitations: only high-income countries included; large heterogeneity; meta-analysis only completed on one key question; specific interventions not extracted due to variability; using BMI as an outcome measure is controversial Feasibility: U.S. was one of the main countries that studies were pulled from; the

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Citation	Theoretical/ Conceptual Framework	Design/ Method/ Purpose	Sample/Setting	Variables	Measurement/ Instrumentation	Data Analysis	Results/ Findings	Level of Evidence; Application to practice/ Generalization
								article included a table that helps condense the findings and direct reader to the evidence that can be used to help prevent obesity in adolescents
(Warschburger & Zitzmann, 2019). Does an age-specific treatment program augment the efficacy of a cognitive-behavioral weight loss program in adolescence and young	CBT; SCT	Design: cluster-RCT Purpose: Answer the research question: Is an age-specific CBT program more efficacious than the traditional CBT weight	N=266 Demographics: more females than males; most were severely obese; CBT group participants were significantly older than TAU group (p=0.023).	IV1: CBT- age specific IV2: TAU (CBT- not age specific) DV1: BMI standard deviation DV2: QoL	BMI (measured by professionals and self-reported) German QoL questionnaire- GW-LQ-KI CHQ PedsQL	Independent t-tests Chi-square tests ANCOVA ANOVA MANOVA Mean Differences	Age-specific CBT intervention was not superior to non-age-specific CBT interventions. No significant difference in BMI standard deviation at 6	LOE: II Strengths: follow up at 12 months; AM at ever visit; validated questionnaires used Limitations: high amount of missing/incomplete data; some data was self-reported

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Citation	Theoretical/ Conceptual Framework	Design/ Method/ Purpose	Sample/Setting	Variables	Measurement/ Instrumentation	Data Analysis	Results/ Findings	Level of Evidence; Application to practice/ Generalization
adulthood? Results from a controlled study. Country: Germany Funding: Federal Ministry of Education and Research Bias: self- reported data increases risk of bias		loss program in adolescents and young adults?	Setting: inpatient Inclusion: 16-21 yr. old; obese (BMI > 97%); seeking wt. loss treatment Exclusion: language barrier; severe cognitive impairments; medical causes of obesity Attrition: 88%			Descriptive Pearson product- moment correlation	and 12 months (p=0.136, p=0.077) GW-QL-KJ scale, no significant difference at 6 months and 12 months (p=0.660, p=0.756)	Feasibility: This study was completed in Germany, not in the U.S., however interventions described do not require region-specific tools and therefore this study can be replicated in a different country and in a different setting.

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Table A2

Synthesis Table

Study Characteristics	Baños et al.	Cheung et al.	Hoying et al.	Jelalian et al.	Melnik et al.	Miri et al.	O'Connor et al.	Pbert et al.	Wang et al.	Warschburger & Zitzmann
Year	2019	2016	2016	2019	2015	2019	2017	2016	2015	2019
SR/LOE I		•					•		•	
RCT/ LOE II					•	•		•		•
QE/ LOE III	•		•							
RCT-Pilot/ LOE IV				•						
Sample Size	47	19	24	33	779	110	464	126	147	266
Theory/Model	CBT/SCT	PRISMA	SCT	CBT/SCT	CBT/CT	CBT/CT	Analytic Framework	SCT	Inferred, CBT/SCT, trans-theoretical model	CBT/SCT
Setting										
Outpatient Clinic	•	•		•		•	•		•	
Hospital										•
Schools		•	•		•			•	•	
Community Center		•							•	
Country										
U.S.		•	•	•	•		•	•	•	
Spain	•									
Iran						•				
Germany										•
Demographics										
Age	8-12 yr.	0-18 yr.	13-14 yr.	13-18 yr.	14-16 yr.	13-18 yr.	2-18 yr.	13-18 yr.	2-18 yr.	16-21 yr.
Independent Variables										
CBT	•		•	•	•	•	•	•		•
TAU	•			•	•	•		•		•
Articles reporting obesity incidence		•								
Medications							•			

Key: BMI= Body Mass Index; CBT= Cognitive Behavior Therapy; LOE= Level of Evidence; PA= Physical Activity; QE= Quasi-Experimental; RCT= Randomized Control Trial; SCT= Social Cognitive Theory; SR= Systematic Review; TAU= Treatment as Usual

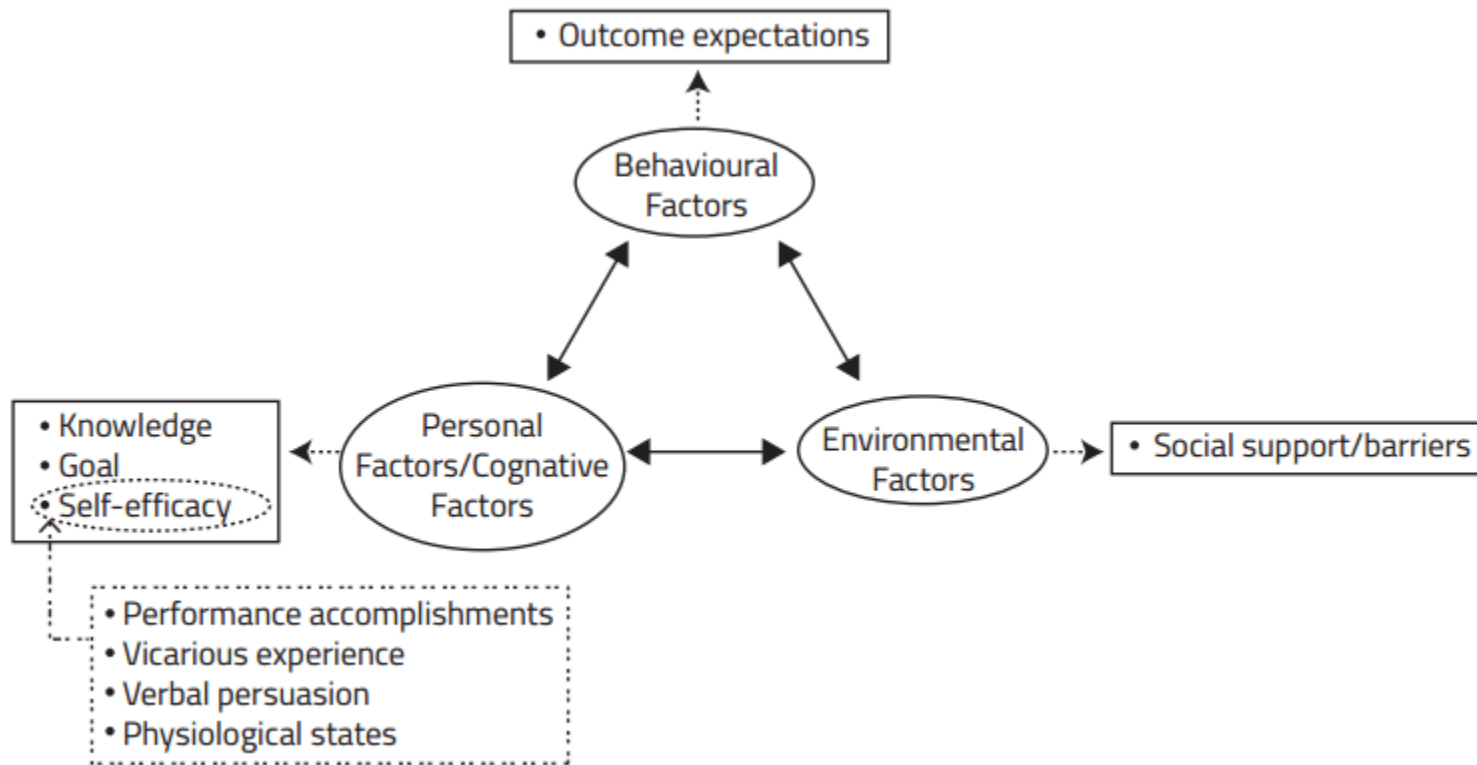
Study Characteristics	Baños et al.	Cheung et al.	Hoying et al.	Jelalian et al.	Melnyk et al.	Miri et al.	O'Connor et al.	Pbert et al.	Wang et al.	Warschburger & Zitzmann
Intervention Evaluation									•	
Dependent Variables/ Findings from CBT interventions										
BMI	↓		↓	↓	↓	↓	↓	↓		↓
% body fat						↓		↓		
Self-efficacy	↑		↑							
Motivation	↑						↑			
Healthy behavior	↑									
Healthy diet						↑	↑	↑		
QoL										↑
Anxiety			↓							
Depression			↓	↓	↓					
Time spent PA				↑			↑	↑		
Sedentary time				↓						

Key: BMI= Body Mass Index; CBT= Cognitive Behavior Therapy; LOE= Level of Evidence; PA= Physical Activity; QE= Quasi-Experimental; RCT= Randomized Control Trial; SCT= Social Cognitive Theory; SR= Systematic Review; TAU= Treatment as Usual

Appendix B
Models and Frameworks

Figure 1

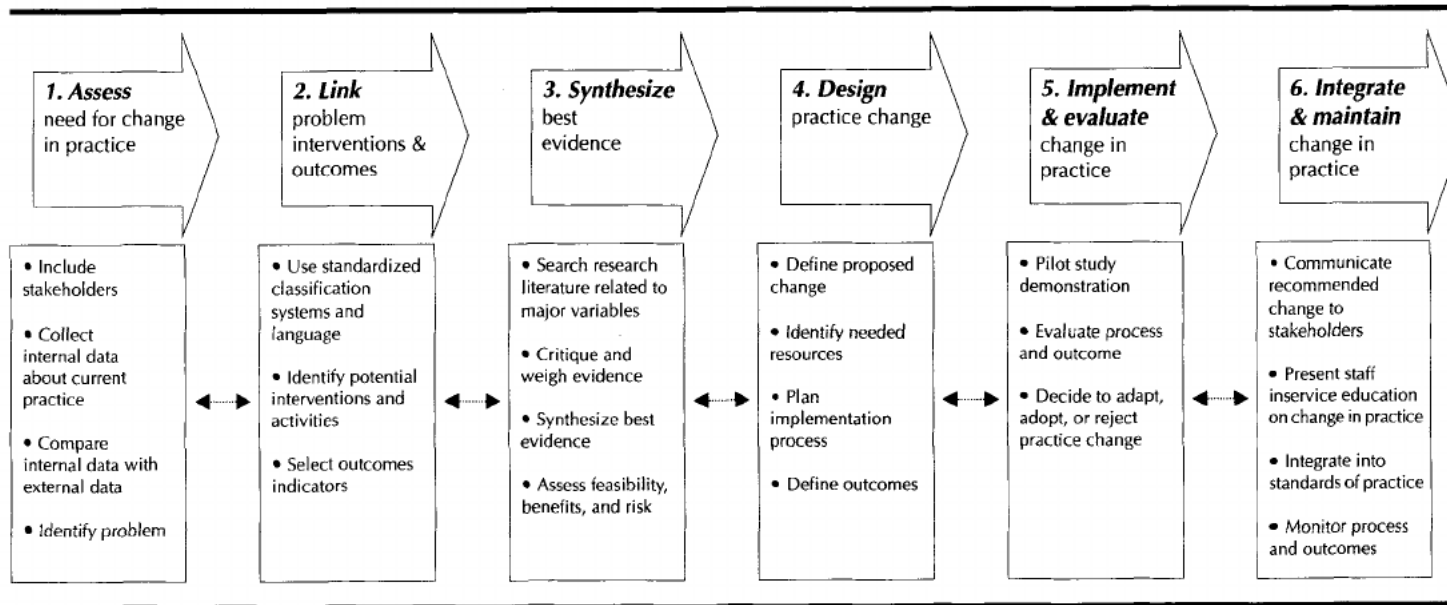
Social Cognitive Theory



(Bandura, 1986).

Figure 2

Rosswurm & Larrabee's Model for evidence-based practice



(Rosswurm & Larrabee, 1999).

Appendix C
HABITS Questionnaire

HABITS questionnaire (Wright et al., 2011)

In this section, we are interested in knowing about your personal habits. Please tell me what answer best describes your situation.

1. In the past month, how often did you: (circle the most appropriate option)

	Never		
A. Eat 3 meals per day:	0	1	2
B. Eat fruit:	0	1	2
C. Eat Vegetables:	0	1	2

2. Do you sometimes eat an extra meal, a snack, a bowl of cereal, or ‘seconds’:

A. Yes	1
B. No	2

3. In the past month, how often did you drink?

	Never/ less than once a week	Several times a week	Once a day	Twice or more a day
A. Juice at home, like apple or orange	3	2	1	0
B. Other drinks at home (iced tea, lemonade, fruit punch, Kool-Aid, Capri-Sun, Sunny Delight, Snapple, Gatorade, Vitamin Water)	3	2	1	0
C. Soda	3	2	1	0
What kind?	<i>Diet</i>	<i>Regular</i>	<i>Both</i>	<i>None</i>
D. Milk or other milk products	3	2	1	0
What kind?	<i>Whole</i>	<i>Low-fat (2%)</i>	<i>Low-fat (1%)</i>	<i>Skim</i>

E. Water 0 1 2 3

4. In the past month, how many times did you:

	Never	Once	Twice or more a week	
A. Eat a fast-food meal? (pizza, Chinese, hamburgers, fried chicken)	2	1	0	
	Never/ Less than once per week	Several times a week	Once a day	Twice or more a day
B. Eat "junk food"? (Candy bars, potato chips, cookies)	3	2	1	0
C. Go outside to play? (ride a bike, do karate, jump rope, play basketball)	0	1	2	3

5. In the past month, how much time did you?

	<1 hour	1 hour	2 hours	3 hours or more a day
A. Watch TV on a weekday?	3	2	1	0
B. Watch TV on the weekend	3	2	1	0
	<i>Never</i>	<i>Sometimes</i>		<i>Always</i>
C. Eat with the TV on?	2	1		0

Appendix D

Budget Explanation

Direct Costs		Indirect Costs	
Printing costs: \$0.60 each copy <ul style="list-style-type: none"> • Recruitment flyers (50) • Questionnaires (4 copies/participant; assuming 10 participants= 40 copies) • Total copies: 90 	\$54	** Labor costs for medical assistant and receptionist to check person in and obtain their height and weight measurements: \$16/hr each (indeed.com)	**\$0
COPE TEEN training (license valid for 2 years); includes 5 participant manuals and 1 trainer manual.	\$450	** Costs to run medical office: water, electric, rent- not factored in, since project will be completed during regular office hours.	**\$0
Program manuals: \$20 <ul style="list-style-type: none"> • 5 manuals included with training price. • Total manuals needed: assuming 10 participants: 5 	\$100	** Electronic medical records system: used to store data. Graduate student has personal username and password to access the data.	**\$0
Total Cost: \$604			

** Student will perform these functions during the DNP project, so no costs are incurred. Additionally, project will be done during normal business hours, but only scheduled on days when a limited number of providers working, so normal patient flow is not affected.

Budget justification:

COPE TEEN training is valid for 2 years and can be used after graduation from the DNP program.

The site is a small office, with only four providers and not all providers work every day of the week. This allowed the student to schedule sessions on days when more exam rooms are available and minimally disrupts the patient flow.

Potential revenue/cost savings:

Per the cope2thrive website, providers can bill for this service using code 99214 for reimbursement purposes. Per discussion with the office manager, reimbursement for this code is approximately \$90/session for Medicaid patients (most of the patients at this location). However, patients with Medicaid cannot be required to purchase the \$20 manual (versus private insurance patients do purchase the manual themselves). Therefore, the \$20 should be deducted as follows:

$\$90(15 \text{ sessions}) - \$20 = \$1,330$ per patient who participates in the program.

Appendix E**COPE TEEN Session Topics**

Figure 1

1. Healthy Lifestyles	6. Communication	11. Portion Sizes
2. Self-esteem	7. Physical Activity	12. Social Eating
3. Setting Goals	8. Heart Rate	13. Healthy Snacking
4. Stress & Coping	9. Nutrition	14. Healthy Choices
5. Emotions	10. Reading Labels	15. Pulling it Together