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Healthier Together: A Holistic Office Protocol Addressing the Chronic Nature of Children and Adolescents with ADHD

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Healthier Together: A Holistic Office Protocol Addressing the Chronic Nature of Children and Adolescents with ADHD

by

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DEDICATION

This evidence-based project is dedicated to any children or adults with ADHD, their parents or caregivers and families who felt like they needed more tools to manage this condition. To Carlos, we did it, we graduated! You have been my rock and with you everything is possible. Thank you to my parents for instilling dedication, drive, and hard work in me. Thank you for the “Bertolotti” work ethic and to my grandmother, Catherine for the sacrifices she made for the family. To my family and friends who stood by me throughout my time in school, Gabby, Masatra, Karen, Maria, Allison, Angie, Cathy, Jacquie, Christine, Lala, Uncle, Christen, Taylor, Nick, Aunt Lynette, Uncle Carl, Clara and Carlos Sr and my parents. It was their words, encouragement, prayers, and hours of phone conversations that kept me going when I wanted to quit. Most of all, I dedicate this project to my three children, Vincent, Noah, and Julia for the struggles our family faced through the ADHD lens of life. I pray that I gave each of you the tools for success. If you harness it correctly; it becomes greatness and I believe in each of you!

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ABSTRACT

Attention Deficit Hyperactivity Disorder (ADHD) is a highly prevalent, chronic condition with symptoms that include inattention, hyperactivity, and impulsivity. ADHD affects six million children in the United States (Tran et al., 2021). The purpose of this evidence-based practice project was to implement a holistic office protocol that addressed the chronicity and future health outcomes of children and adolescents, ages 2-17 years with ADHD through stimulant or non-stimulant medication prescriptions, behavioral therapy referrals, and education surrounding diet, and exercise. A comprehensive, systematic literature search yielded 16 articles to determine best practice when treating children and adolescents with ADHD in primary or pediatric care settings. The gold standard treatment included medication and behavioral therapy and additional recommendations included treating the whole person through diet and exercise to combat symptom management and future negative-health outcomes. Initial Vanderbilt and body mass index (BMI) scores were recorded at the time of intervention, followed by 12 weeks of an office protocol that included stimulant or non-stimulant medication prescription, behavioral therapy referrals and education on diet and exercise. Patients and caregivers tracked progress to increase awareness and create conversations at weeks 2, 4, 6, 8, 10, and 12. Post-intervention Vanderbilt and BMI scores compared to pre-intervention scores. The Vanderbilt Symptoms and Performance scales and BMI were scored and assessed for normality (Shapiro & Wilk, 1965). The Symptoms scale was judged to be normally distributed; the Performance scale was judged to not be distributed normally, and BMI was judged to be normally distributed. There was no statistical evidence of a decrease in symptoms as measured by the Vanderbilt Symptoms scale. There was statistical evidence of a decrease in performance as operationalized by the Vanderbilt Performance scale. There was no statistical evidence of a decrease in BMI. McNemar's test revealed no difference between obesity in the pre-intervention and the post-intervention.

Further research is needed to address the positive benefits of an office protocol that addresses the chronic nature of ADHD.

Keywords*:* ADHD, primary care, pediatrics, best practice

CHAPTER 1

INTRODUCTION

Managing chronic conditions like attention deficit hyperactivity disorder (ADHD), can be hindered by system level barriers. Challenges faced during long-term management of ADHD patients require ongoing care and support to decrease future healthcare burdens. Due to the shortage of the mental healthcare providers, pediatricians, primary care physicians including family nurse practitioners (FNPs), each are faced with time barriers in their daily practice, which can limit patient education time. Clinical practice guidelines in the American Academy of Pediatrics recommend spending more time with ADHD patients and families to develop a comprehensive care plan (Wolraich et al., 2019). Office protocols aimed at ADHD best practice, education and patient specific needs could assist to facilitate this gap. This multimodal EBP project includes an office protocol that consists of medication prescriptions, behavioral therapy referrals, and education surrounding diet and exercise to manage children and adolescents with ADHD.

Background

ADHD is a highly prevalent, chronic condition with symptoms that can include inattention, hyperactivity, and impulsivity or a combination of the three. In fact, it was estimated that six million children in the United States ages 2 to 17 years of age have received a diagnosis of ADHD (Centers for Disease Control and Prevention [CDC] (2022a). Although ADHD affects each child differently, it is more prevalent in boys than girls (National Institutes of Health, 2022). The (CDC, 2022a) notes boys (13%) are diagnosed with ADHD nearly twice as much as girls (6%) and prevalence varies by state, although ADHD in children is noted in all 50 states. The fifth edition of American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders (DSM-5) categorized ADHD into three distinct presentations, which are based on categories of symptoms that have persisted for six or more months. ADHD presentations follow

specific diagnostic criteria and include the following subtypes: predominantly inattentive presentation, hyperactive-impulsive presentation, and combined presentation, therefore, detailing the need for patient specific care according to symptoms (DynaMed, 2023). Next, the American Academy of Pediatrics (AAP) guidelines emphasize that ADHD is a chronic condition and recommends practitioners understand unique family needs, maintain strong lines of communication, build relationships, and provide education to families (Wolraich et al., 2019). Symptoms of hyperactivity often appear in children as young as three and combinations of these symptoms can continue to progress well into adulthood, (Austerman, 2015; Wolraich et al., 2019). Meaning, patients with ADHD have a life-long diagnosis that requires chronic management. Early recognition and treatment goals should be aimed at tertiary prevention, through reducing symptoms and improving function.

Unmanaged symptoms of ADHD can lead to further health risks in children and adolescents. The Centers for Disease and Control (2022a) reported impulsivity and inattention in children with ADHD can lead to actions that decrease their protective health behaviors, therefore increasing their risk for being overweight or obese. The CDC (2022b) finds obesity to be a serious issue in the United States with approximately 14.7 million children and adolescents being affected. The CDC also noted obesity increases one's risk for future health complications including hypertension, high cholesterol, type 2 diabetes and breathing problems such as asthma, sleep apnea and joint problems (CDC, 2023d). Thus, obesity can further complicate the future health of children with ADHD by increasing their risk of comorbid conditions. Children with ADHD can experience a concurrent mental health diagnosis, which pose additional challenges during management. The CDC (2022a) noted that approximately 60% of children with ADHD had a least one additional mental, emotional, or behavioral disorder. Tracking symptoms and excluding additional factors that may contribute to or mimic ADHD symptoms are crucial tools in managing ADHD pediatric patients (Austerman, 2015; Wolraich et al., 2019). Patient

management should include regularly tracking ADHD symptoms that should be reported back to the provider.

The etiology of ADHD is complex. At present, no solitary cause has been associated with the diagnosis of ADHD, but both genetically inherited and non-inherited elements have contributed to this neuropsychiatric disorder (Floet et al., 2010). According to the CDC (2023c), a genetic risk factor associated with ADHD includes a previously diagnosed family member with ADHD, intrauterine growth restrictions, history of brain injuries, and certain genetic conditions. It was reported that children with a parent or sibling diagnosed with ADHD have a 60-80% chance of developing ADHD compared to children without a family history (Schroer et al., 2021). Hence, practitioners should be aware of both the genetic and non-genetic risks associated with ADHD when managing this chronic condition in patients.

Since there is no cure, practitioners must manage children with ADHD based on guidelines and best evidence that assist with controlling symptoms. Fortunately, validated tools do assist practitioners in managing ADHD symptoms in children and adolescents by providing an objective measure. One commonly utilized, validated tool, is the National Institute for Children's Health Quality (NICHQ) Vanderbilt Assessment Scale. Since its creation, the NICHQ Vanderbilt Assessment Scale follow up allows both parents and teachers the ability to score the child based on a series of Likert-style questions related to ADHD symptoms and remains a reliable and cost-effective way to assist with the management ADHD symptom in the clinical setting or in research (Wolraich et al., 2003). This approach allows for collaboration among those actively involved with the care of the child or adolescent. It was noted that improved communication between patients and providers is necessary in effectively treating ADHD (Wolraich et al., 2019). Managing symptoms through parental feedback via a tracking is an appropriate means to care for these patients.

Pediatricians and primary care providers including Family Nurse Practitioners (FNPs) are often the first set of providers who address the healthcare needs of children who present with ADHD symptoms of inattention, hyperactivity and/or impulsivity. It is imperative that practitioners remain knowledgeable about current practices to effectively manage ADHD as the chronic condition that it has been labeled. Updated AAP guidelines (2019) emphasize that ADHD is a chronic condition and recommends practitioners attempt to understand the unique family dynamics of their patients. The AAP also suggests practitioners incorporate patient preferences in how services are provided as it can increase adherence to treatment. Liu (2020) adds that practitioners should include education surrounding the importance of regular exercise because it improves overall ADHD symptoms and cognitive function. Through inclusion of validated tools, guidelines, evidence-based practice, education, and parental input, the practitioner can further guide screenings, care, clinical decisions, and treatment in a patient-centered approach (Wolraich et al., 2019). Patient visits should include holistic discussions and education surrounding medication as the gold standard, followed by behavioral therapy, diet and exercise to reduce the chronic effects of this condition, thus, allowing the patient and family unit to be involved in healthcare decisions.

Data Supporting Need for the Project

ADHD is a chronic condition, which begins in childhood and persists throughout adulthood. Children with ADHD are more likely to have symptoms that affect school, work, home, relationships, or future health. These same children are more likely to struggle with conditions like obesity, which further places their future health at an increased risk. The following global, national, and state data further reinforce the need to provide a systematic evidenced-based protocol tailored to family's needs to treat ADHD in children and adolescents.

Global Data

The prevalence of ADHD is high in the United States (US) and globally. Global prevalence estimates of ADHD are approximately 5% of all children and adolescents have received an ADHD diagnosis (Song et al. 2021) Whereas the CDC (2022a) notes global prevalence estimates of ADHD are 3.1 % in children ages 10-14 and 2.4 % in children in children ages 15-19, with boys having a higher prevalence than girls. Although children less than 10 years of age were not included in the WHO data, one could assume the overall percentages would increase with their addition to the population total. The link between obesity and ADHD has added further risks to the future health of ADHD children due to the co-morbid effects of obesity (CDC, 2022b). In fact, it was noted that 39 million children under the age of 5 were considered obese in 2020, and 340 million children and adolescents ages 5-19 were overweight or obese in 2016 (World Health Organization [WHO], 2021), globally placing additional health burdens on greater than 5% of the world's children with ADHD.

National Data

In comparison to the world, the prevalence of ADHD is noted to be higher in the US than the remainder of the world, and the (CDC, 2023a) emphasized that ADHD has been recorded in every state. In fact, one author reported approximately 9.1% of the United States (US) pediatric population or approximately 6 million children ages 2-17 years of age have received a diagnosis of ADHD (CDC, 2023b). Children and adolescents with ADHD are at increased risk for obesity or a BMI at or above the 95th percentile. Alarmingly, the CDC found children and adolescents have a high rate of obesity in the US, with a prevalence of 19.7 % recorded in 2017-2020 (CDC, 2022b), forever linking both ADHD and obesity. Due to the chronic nature of ADHD, symptom management is key to improving outcomes. A national parent survey noted three out of four US children with ADHD receive treatment for ADHD and found 23% of children with ADHD did not receive medication nor behavioral treatment (CDC, 2023c). The American Academy of Pediatrics

(AAP) guidelines recommends primary care providers follow the medical home model, which includes care that is comprehensive, patient-centered, coordinated, accessible, and is committed to quality and safety (CDC, 2021). Timely detection, diagnosis and treatment should be the goal for all children and adolescents who present with symptoms according to the DSM-5. One consensus group called for increased funding and streamlined communication among health services to improve outcomes for people with ADHD (Young, et al., 2021). Education should be made a priority for pediatric patients diagnosed with ADHD and their families.

State Data

Despite Northwest Indiana's location, the prevalence of ADHD in Indiana was significantly higher than nearby states. Recent data reported 10.2 % of children diagnosed with ADHD lived in the state of Indiana, while neighboring states reveal Illinois 8.4%, Michigan 9.7%, and Ohio 10.2% (CDC, 2023b). When linking ADHD to obesity, Family and Social Services (2023) noted approximately one third of children 5 years and younger in Indiana weigh more than 85% of their peers placing additional health risks related to obesity in youth who have been diagnosed with ADHD in Indiana. Other challenges faced by Indiana's youth are access to care issues, including the 67 Indiana counties who are medically underserved and the 7.5% of Indiana children and adolescents who lack health care coverage (US Department of Health and Human Services, 2021). When compared to global data, children in Indiana are diagnosed nearly three times more than the rest of the world, causing great concern for the state of Indiana and a need to improve access to care, timely diagnosis and evidenced-based, patient-centered treatment.

Clinical Agency Data

The clinical agency where this evidenced-based practice (EBP) was implemented in a pediatric office in Northwest Indiana. Currently, the number of pediatric patients diagnosed with ADHD in this practice is approximately 250 pediatric patients (personal communication, August 2022). The current practice for managing ADHD pediatric patients includes the gold standard for

treatment, including a prescription for FDA approved medications including methylphenidates or amphetamines and a referral to behavioral health. Currently, behavioral health referrals are insurance dependent, and no specific site is utilized. To monitor patient progress and symptom management, the National Institute for Children's Health Quality (NICHQ) Vanderbilt Assessment Scale is utilized. Both parents/ caregivers and teachers are encouraged to complete this tool every three months, it is then reviewed by the practitioner during office visits, and medication adjustments were considered if symptoms were unmanaged. In preparation for this EBP project, the site provider, a board-certified pediatrician was interviewed to discuss the need for an EBP project that included a more inclusive approach to ADHD care, which addressed the chronic nature of this condition a including obesity and the project was approved (personal communication, April 13, 2022, June 18, 2023).

Purpose of the Evidence-Based Practice Project

The purpose of this evidenced based project was to implement a holistic office protocol that addresses the chronicity and future health outcomes of children and adolescents, ages 2-17 diagnosed with ADHD.

PICOT Question

The PICOT question of this EBP project was to determine if a 12-week office protocol that included education surrounding medication prescribing and adherence, behavioral therapy referrals, diet, and exercise via patient tracking assisted with managing symptoms and its effect on NICHQ Vanderbilt scores in children and adolescents ages 2-17 diagnosed with ADHD?

EBP Project Description

Participants of this EBP project included patients from a Northwest Indiana pediatric office who have previously been diagnosed with ADHD as recorded in their electronic medical record (EMR). Once agreeable to participation, participants were provided with educational material on overall ADHD education and templates for daily logging of events. The intervention

implemented was a holistic office protocol, supported by guidelines, that provided ADHD patients stimulant or non-stimulant medication prescriptions, behavioral therapy referrals, and education surrounding diet, and exercise. Families were encouraged to participate in MyChart to streamline contact and provide ease of parent/caregiver to provider communication. Next, the educational handouts and recommendations were given to the patients by the nursing staff or project leader (PL). The PL messaged patients via MyChart or called patients who could not access MyChart every other week to ensure the same level of care was achieved for all patients. At the start of the project, eligible participants were identified via the EMR. Patients were included on a rolling calendar basis from the project fruition until five weeks after the start of the project, which allowed enough time to effectively monitor the intervention protocols. Primary outcomes were measured by comparing enrollment or pre-intervention NICHQ Vanderbilt scores to 12-week or post intervention NICHQ Vanderbilt scores. Due to co-morbid risks, secondary outcomes included comparing enrollment or pre-intervention BMI scores via the EMR with 12-week or post intervention BMI scores via the EMR.

CHAPTER 2

EBP MODEL AND REVIEW OF LITERATURE

Evidence-based Practice Model

The EBP model used in this project served as a problem-solving framework which utilized a data driven protocol to change practice in a Northwest Indiana pediatric office. An extensive systematic literature search and quality appraisal of research findings were performed, and evidence was carefully chosen for inclusion into the project. Literature was analyzed and conclusions were drawn.

Overview of EBP Model

Developing a spirit of inquiry and identifying the need for change are essential to best practice. Additionally, choosing an EBP model that resonated with the project leader (PL) was a vital component to the project. The model chosen to steer this EBP project was the Iowa Model of Evidence Based Practice. The Iowa model originated in 1994, by nursing scholar, Marita Titler (Titler et al., 1994). During this time, Titler's model was considered a "heuristic model at the University of Iowa Hospitals and Clinics for infusing research into practice to improve quality of care" (Titler et al., 1994, p. 307) This model encouraged college students to perform critical thinking based on clinical problems. It provided a framework to achieve success. To remain current with practice since its 1994 fruition, the Iowa Model has undergone multiple revisions. Hence, the Iowa Model was chosen for its ties to the discipline of nursing, the ease of use, its need to evolve and remain current with practice, and clear, concise steps to improve clinical problems through the inclusion of evidence. Additionally, the 2017 or latest version of the Iowa Model details seven steps in the form of a flow chart. The seven-steps included in the model are: (a) identification of triggers or opportunities for change, (b) stating the question or purpose, (c) formation of a team, (d) assembling, appraising, and synthesizing of the evidence, (e) formation

of the design, (f) integrating the practice changes, and (g) a dissemination of the results (Melnyk & Fineout-Overholt, 2019).

The first step of the model, identification of a trigger was noted during first-hand accounts of patient ADHD visits at the project site, while the project leader was in the DNP student role. As the PL participated in ADHD follow up visits, she witnessed unmanaged symptoms, including a lack of understanding surrounding the importance of treatment and the need for further education. The purpose or PICOT question served as step two and allowed for a clear focus of the goal. As part of step two of the Iowa Model, the need for further education was determined. Since the trigger was a priority for the pediatrician, step three took place, and a team of stakeholders was formed. Steps four through seven included appraising evidence, synthesizing the vast amount of evidence into commonalities, forming an EBP project design, integrating a sustainable change into practice and disseminating results.

Literature Search

Systematic literature searches provide background information on a topic of interest. It is an organized means of extensively and comprehensively sifting through literature to seek the most current data surrounding the area of interest.

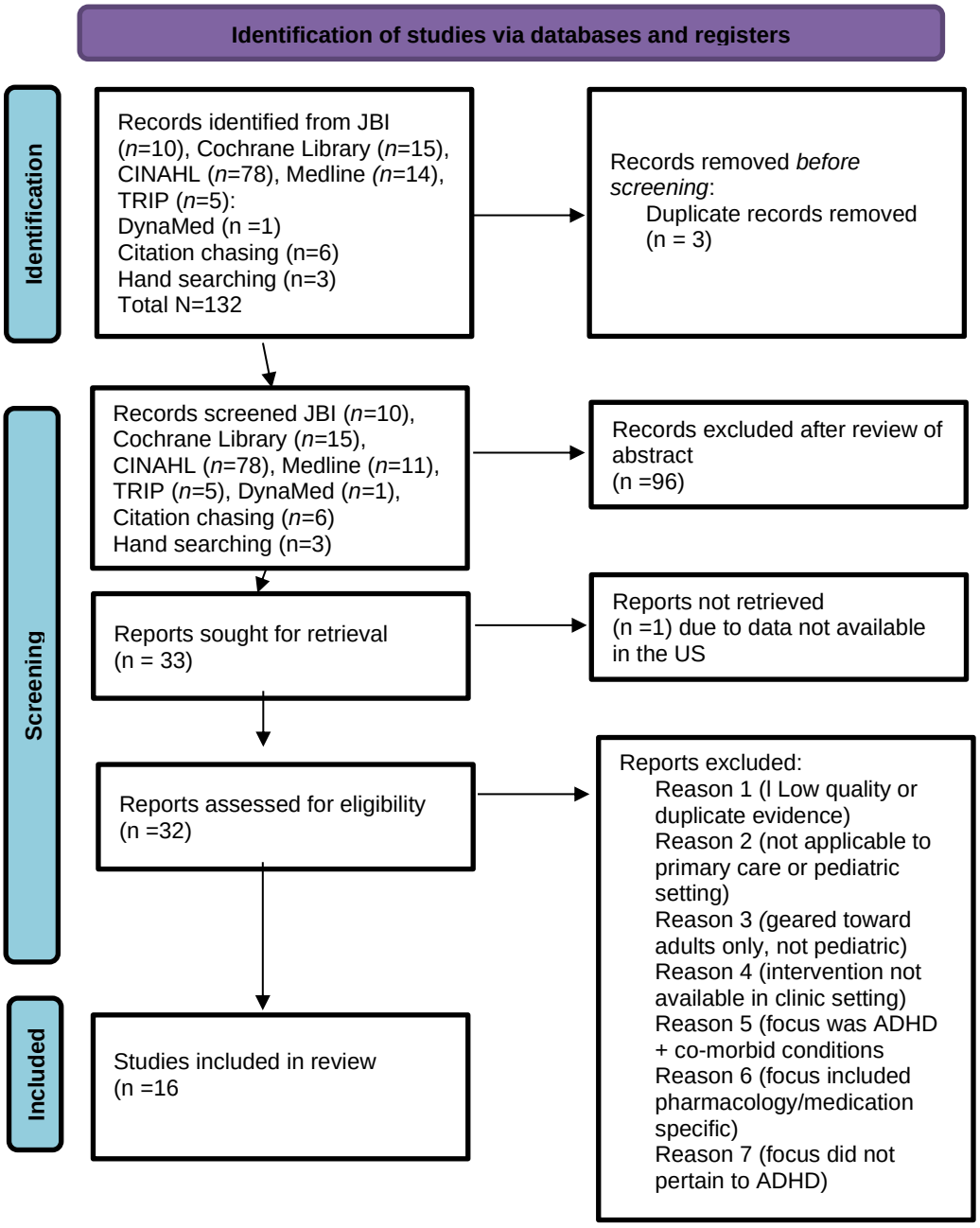
Sources Examined for Relevant Evidence

This EBP project consisted of systematic search to find the best evidence surrounding "Attention Deficit Hyperactivity Disorder" AND "primary care" OR "primary healthcare" OR "primary health care" OR pediatrician AND treat* OR "best practice*" OR guideline* OR "evidence-based treatment" OR "evidence based practice". Multiple databases were searched, MeSH headers were used and citation chasing and hand-searching in Google Scholar were performed. The databases searched included: (a) Turning Research into Practice (TRIP) (b) Cumulative to Nursing and Allied Health Literature (CINAHL), (c) Cochrane, (d) Joanna Briggs Institute (JBI), (e) Medline with Full Text via EBSCO, (f) DynaMed, (g) Google Scholar. TRIP,

DynaMed, and American Academy of Pediatrics (AAP) allowed for retrieval of clinical practice guidelines, which are considered high levels of evidence that guide practice. Whereas, Cochrane, CINAHL, Google Scholar, Medline with Full Text via EBSCO, and JBI databases allowed for strong research with a broad focus that supported this project. Hand searching narrowed the focus through exploring additional articles related to strong broad focused evidence. Inclusion and exclusion criteria were applied each search to obtain a current and systematic search. Inclusion criteria limiters for the systematic searches consisted of peer reviewed articles in the English language, which had been published in the last five years 2018-2023. Main inclusion criteria focused on ADHD, primary care, pediatrics and best treatment or practice. The exclusion criteria consisted of articles older than five years, duplicate articles, articles involving adults only, research focused on a specific medication, material that addressed ADHD with co-existing conditions, and interventions which were not geared toward a primary care or pediatric setting. For example, interventions geared toward initiating change in the mental health setting, school setting, or those involving animals', yoga or massage were not included as they could create additional cost burdens to participants. Additional exclusion criteria included research not focused on ADHD or that dealing with the ADHD transitioning from childhood to adulthood, or those focused specifically on medication, or articles that did not address the PICOT question. See Prisma figure 1.1 for a detailed description.

Figure 1.1

PRISMA Flow Chart of Literature Review



Levels of Evidence

To rate the evidence, the Melynk and Fineout Overholt rating system was utilized for this project. This evidence hierarchy allowed works to be categorized into levels I through VII. The highest level of evidence or level I evidence included work from both systematic reviews and meta-analysis. A total of four pieces of evidence from the literature review fit into level I; DynaMed, 2023; Papanastasiou et al., 2021; NICE, 2019; Wolraich et al., 2019. Melynk and Fineout Overholt (2019) noted Level II evidence should have included randomized control studies (RCTs) and two pieces of evidence fell into this category; Guevara et al., 2021; Khosbakht et al., 2021. Evidence from non-randomized control trials belong to Level III, no pieces of evidence were placed here. Level IV should have included both case-control and cohort studies and six articles fit here; Darabi et al., 2022; Darzi et al., 2022; Del-Ponte et al., 2019; Goode et al., 2018; French et al., 2019; Odhiambo, 2022. Level V evidence included descriptive or qualitative studies, while Level VI evidence came from single studies of the same design and no pieces fit into either category. Level VII included expert opinion, including a leader in ADHD and narrative reviews, four articles were consistent for this level of evidence; Fotoglou et al., 2022; Jerome & Jerome, 2020; Pinto et al., 2022; Schroer et al., 2021.

To ascertain the quality of the evidence, an appraisal of the articles was performed on each individual article with an appropriate valid tool (Melynk & Fineout Overholt, 2019). To evaluate the quality of the evidence for RCTs, systematic reviews, evidence summaries, and cohort studies, the Critical Appraisal Skills Programme (CASP) checklist tools were used. CASP provided specific checklists geared toward study types that critically appraise the evidence. (Critical Appraisal Skills Programme, 2022). Instruments used to appraise the quality of the evidence were specific to the articles chosen. Since there was not a CASP checklist to evaluate a meta-synthesis that included qualitative data, the Fineout and Overholt (2019) tool was utilized to appraise this article.

Evidence surrounding clinical practice guidelines were appraised using the user-friendly Appraisal of Guidelines for Research and Evaluation II (AGREE II) instrument, which is considered a valid and reliable tool to appraise CPGs internationally (Advancing the Science of Practice Guidelines, 2009)**.** One purpose of the AGREE II was to assess the quality of CPGs prior to adopting the recommendations into practice. The AGREE II tool consists of 23 items organized into six domains that included: (a) scope and practice, (b) stakeholder involvement, (c) rigor of development, (d) clarity of presentation, (e) applicability, and (f) editorial independence (Brouwers et al., n.d.). Refer to table 1.1 for a summary of the evidence, including a list of the appraisal tools used to assess each article. A more complete summary of the evidence can be found in Appendix A, the evidence grid.

Construction of Evidence-based Practice

Evidence based practice consists of best evidence, clinical expertise, and patient preferences and each piece of this triad is essential to create change. Best evidence is gathered and constructed by examining the literature and noting commonalities.

Synthesis of Critically Appraised Literature

Following a critical appraisal of the current literature, the evidence was further analyzed, and the following themes were concluded as interventions to educate patients, families and manage ADHD symptoms in children and adolescents**:** (a) medication, (b) behavioral therapy referral, (c) diet, and (d) exercise. Additional interventions were identified in the literature like equine therapy, yoga, and school-based interventions, but these interventions were not applicable to the pediatric office-based setting where the project was assembled.

Medication

Based on the synthesis of evidence, the most appropriate treatment to address children over five years old with a diagnosis of ADHD includes a prescription for stimulant medication, including methylphenidates or amphetamines (DynaMed, 2019; Jerome & Jerome, 2019; NICE, 2019; Schroer et al., 2021; Wolraich et al., 2019). If the stimulant medications are ineffective or poorly tolerated, providers should switch the stimulant class, or prescribe single isomer stimulants and if stimulants are not tolerated, non-stimulant medication can be utilized. During these times of adjustment, children should be closely monitored (DynaMed, 2019). According to a Clinical Practice Guideline (CPGs) in the United States (US), the first line treatment for managing ADHD in children ages 6-18 includes an FDA approved stimulant medications like methylphenidates or amphetamines, while children ages 4-5 can consider methylphenidates if behavioral interventions do not improve symptoms (DynaMed, 2019; Schroer et al., 2021; Wolraich et al., 2019). Guidelines in the United Kingdom echoed that of US guidelines. According to NICE (2019) stimulant medication is a recommended first line treatment for children over the age of 5 years old. It was further noted that FDA approved stimulants are considered the gold standard of treating ADHD (Schroer et al., 2021) and should be adjusted as symptoms persist. Although, as with any chronic condition, outcomes may be affected if mediation adherence was not maintained. The authors further noted that education on medication adherence is an important part of treatment in managing symptoms in ADHD. Guevara et al., (2021) suggested families with greater care management via an electronic health record (EHR) demonstrated greater reductions in symptoms in those with less engagement. In addition to prescribing, practitioners should educate patients and families on the importance of taking the medication as part of the treatment plan, and this can be streamlined via communicating via the EHR.

Behavioral Therapy Referral

Primary care practitioners can assist with managing ADHD symptoms in children by providing behavioral therapy referrals as part of the treatment plan (DynaMed, 2019; Jerome & Jerome, 2020; NICE, 2019). Jerome and Jerome (2019) recognized that stimulants are first line treatments in ages six years and up, but additionally noted behavioral treatment as first line management in all patients. Clinical practice guides in both the US and the United Kingdom (UK) noted that behavioral therapy is first line treatment in children ages 4-5 years of age before medication is considered (DynaMed, 2019; NICE, 2019). Next, DynaMed (2019) considers a combination of both medication and behavioral therapy as first line treatment for children ages 6-18 years diagnosed with ADHD. Practitioners should aim for patient and family discussions that provide education surrounding research that supports consistent participation in behavioral therapy as part of a holistic approach to care.

Diet

Current evidence suggested the inclusion of non-pharmacological measures such as following a healthy diet to be beneficial as part of the treatment plan for managing symptoms in ADHD (Darabi et al.2022; Darzi et al. 2022; Del-Ponte et al.,2019; DynaMed, 2019, Fotoglou et al., 2022; Khoshbakht, et al., 2021; Odhiambo, 2022, Papanastasiou et al. 2021, Pinto et al. 2022) In contrast, a meta-analysis of RCTs and observational studies noted significant gaps in knowledge regarding the effectiveness of ADHD and non-pharmacological approaches including dietary (Goode et al., 2018). Clinical practice guidelines suggested dietary restriction of synthetic food colors such as tartrazine and sodium benzoate do not cure but may prevent increased symptoms in children and avoiding synthetic food coloring may be associated with improvement of parentally reported ADHD symptoms in children (DynaMed, 2019). Odhiambo (2022) suggested a food diary as means to track foods and drinks that trigger hyperactivity and even goes on to note if links are found these children should be referred to a dietician. In one case

control study, researchers sought to explore the relationship of dietary polyphenol and ADHD risks in children. This study found that increased dietary phenols was associated with a reduced risk of ADHD symptoms and one unit increase of polyphenols in dietary intake could reduce the risk of ADHD in children (Darzi et al., 2022). Additionally, Del-Ponte et al, (2019) noted diets high in refined sugars and saturated fat can increase the risk of ADHD symptoms, whereas diets high in vegetable and fruit consumption would protect against ADHD or hyperactivity. An integrative review suggested although not curative, a balanced diet with high fruits and vegetables, low fat dairy and low amounts of simple sugars may decrease hyperactivity and emotional symptoms (Ohiambo, 2022). Pinto et al. (2022) and Khoshbakht, et al. (2021) suggested the use of specific diets such as the DASH diet, while Darabi et al. (2022) and Pinto et al. (2022) found the Mediterranean Diet are helpful in controlling symptoms of ADHD. Further suggesting both the DASH diet and the Mediterranean diet, which are both high in polyphenols, will assist with controlling symptoms of ADHD.

Exercise

Exercise is a well-known means to combat obesity. Although one author noted, incorporation of physical activity when treating ADHD is often overlooked by parents, therapists, and educators (Fotoglou et al., 2022). In connection, one systematic review of both qualitative and quantitative data revealed lack of education was a barrier to attitudes, beliefs, and experiences within primary care (French et al, 2019). Considering children with ADHD have an increased risk for obesity, education surrounding ways to combat obesity through exercise should be considered in the plan to treat children with ADHD. Although research reveals medication is considered the gold standard of treating ADHD, clinical practice guidelines from the United Kingdom report practitioners should educate ADHD patients and their families on the benefits of a healthy lifestyle that include exercise as part of the treatment plan (NICE, 2019). Ultimately, the goal of treating any chronic health condition is accomplished through supporting

the entire person. Canadian physicians noted the importance of offering focused support, which emphasized holistic approaches to managing ADHD in addition to orders for medication and behavior therapy (Jerome & Jerome, 2020). Literature from Greece noted improving nutritional and physical conditions of children with ADHD helped to increase their Quality of Life (QOL) and provided more positive emotional regulation (Fotoglou et al, 2022). Detailing how exercise as part of the ADHD treatment plan supports the entire person through efforts aimed at combating future health risk in children with ADHD.

Table 1.1

Summary and Appraisal of Evidence

Author/yr	Database(s)	Level of Evidence/Type	Quality/Tool
DynaMed (2023)	DynaMed	I/CPG	Agree II/Strong
NICE (2019)	TRIP	I/CPG	Agree II/ Strong
Wolraich et al. (2019)	AAP	I/CPG	Agree II/ Strong
Khoshbakht (2021)	Citation Chasing	II/RCT	CASP/Strong
Guevara et al. (2021)	CINAHL	II/ RCT	CASP/ Strong
Darabi et al. (2022)	Google Scholar	IV/Case-Control	CASP/High
Darzi et al. (2022)	Citation Chasing	IV/Case-Control	CASP/ Strong
Del-Ponte et al. (2019)	Citation Chasing	IV/ Meta-analysis	MFO/ Moderate
Goode et al. (2018)	CINAHL/Medline	IV/ Meta-analysis	MFO/ Moderate
French et al. (2019)	Medline	IV/Systematic Review	CASP/Strong
Odhiambo (2022)	JBI	IV/ Integrative Review	MMAT/Strong
Papanastasiou, & Papanastasiou (2021)	Google Scholar	IV/ Meta-analysis	CASP/Strong
Pinto et al. (2022)	Citation Chasing	VII/ Narrative Review	MFO/ Moderate
Fotoglou et al. (2022)	Google Scholar	VII Literature Review	MFO/ Moderate
Jerome & Jerome (2020)	CINAHL	VII/ Narrative Review	MFO/Moderate
Schroer et al. (2021)	CINAHL	VII/ Narrative Review.	MFO/Low

CHAPTER 3

IMPLEMENTATION OF PRACTICE CHANGE

When practicing under the evidenced based triad, practitioners are wise to integrate best evidence with clinical expertise and patient preferences. This EBP project was implemented utilizing the best evidence on ADHD, clinical skills by the PL and foci on individual patient needs. This EBP project consisted of an office protocol that provided pediatric patients diagnosed with ADHD patient specific medication prescriptions based on evidence, behavioral therapy referrals and education surrounding diet and exercise. Office protocol checklists assisted with physical daily reminders for patients or caregivers and allowed for further reinforcement over the course of at least 12-weeks. Three participants were extended to 14 weeks due appointment cancellations due to illness and limited available appointment time slots that fit the participant schedule. One participant went up to 16 weeks before the last contact due to the caregiver being hospitalized.

At the start of the project, the PL identified eligible participants via the EMR**.** From the project fruition, patients were recruited into the project on a rolling calendar basis until four weeks after the start of the project, which allowed enough time to effectively monitor the intervention protocols over 12-weeks. In addition to contact via office phone PL, all participants were encouraged to utilize MyChart to communicate with the office staff during the project, but this was not a requirement. To further provide specific instruction, patients and families were provided office protocol checklists as part of the packet to self-track medication adherence, behavioral therapy attendance, diet, exercise in relation to ADHD symptoms. The PL, or the registered nurse (RN), all maintained lines of communication via MyChart, phone or in person. Daily use of office protocol checklists served as patient visual reminders and were discussed on the office telephone on weeks 2, 4, 6, 8, 10, 12 by this PL. Further interactions were performed via the office phone by the PL or via MyChart by the office nurse and included individual, patient

specific feedback. Possibilities for areas of discussions surrounded medication prescriptions including any side effects or adherence challenges. “Is the medication being taken as prescribed?” “Are there any barriers?” Questions regarding behavioral therapy included behavioral therapy attendance and “are there any barriers?” Diet questions utilized were, Are there any barriers to increased fruits and vegetables (phenols) or food triggers? Exercise questions included “Are there any barriers to daily physical exercise?” Then, based upon responses, further intervention focused on protocol areas of need. All barriers were discussed with the pediatrician and a plan of action was initiated based on the individual participant needs. Examples of interventions to barriers included updating behavioral health therapy orders, medication adjustments, discussions surrounding healthy diet and exercise, calls to additional pharmacies when medication was out of stock, and additional appointments. Upon the completion of this 12-week intervention, primary outcomes were measured by comparing enrollment or pre-intervention NICHQ Vanderbilt scores to 12-week scores, noting any changes. Due to co-morbid risks associated with ADHD such as obesity, secondary outcomes included comparing enrollment or pre-intervention BMI scores via the EMR with 12-week or post intervention BMI scores via the EMR.

During the planning phase of this EBP project, the PL consistently met with the office physician and office staff to ensure thorough planning and successful implementation of the project took place. Discussions, and feedback with key stakeholders, mainly the pediatrician and his office nurse, took place weekly in the clinic. The PL previously shadowed the pediatrician during multiple ADHD visits to orient herself with the flow of the office. The PL also followed the office staff during their scheduled workdays to assess how the implementation of the EBP project could best be integrated into the office flow. Multiple opportunities for feedback from each of the stakeholders were offered at regular time frames throughout the planning phase. Feedback from

each stakeholder's feedback was carefully considered, and this was incorporated into the EBP project by this PL.

Participants and Setting

This EBP project took place in a pediatric practice that serves a multitude of patients from birth to 18 years of age, mainly from Northwest Indiana. The office consisted of two pediatricians, one male and one female. Conversation with the site facilitator surrounding the possibility of alternate physician coverage in time of absence, was discussed. The decision to update the second physician on the EBP project was made by both the PL and site facilitator prior to this write up*.* The focus of this EBP project was geared toward patients of one pediatrician within the practice. Within this practice, patients were cared for by a male board-certified pediatrician who has been in practice for over 20 years plus a registered nurse who facilitates this care. Participants for this project have received a previous diagnosis of ADHD per the electronic medical record (EMR) and are consistently accompanied by a parent or caregiver during office visits.

Pre-Intervention Group Characteristics

The patient population served at this location included pediatric patients from birth to 18 years of age. Eligible participants for this EBP project include patients between the ages 2-17, that have been previously diagnosed with ADHD per their electronic medical record (EMR). Caregivers were included as part of the project due to the minor status of the participants and their inability to meet their own needs in regard to healthcare. Pediatric patients included in this project had previously been diagnosed with ADHD, agreed to their prescribed medication to treat ADHD, and were able to exercise, since this was a part of the project. Considering the CDC (2021) reported approximately 60% of patients with ADHD had at least one additional mental, emotional, or behavioral disorder, these patients were also included in the project. Pediatric patients who did not have the diagnosis of ADHD listed in their EMR will not be eligible to

participate in this EBP project. Those who were not taking medication(s) to treat ADHD, and those who were unable to physically ambulate or could not exercise were excluded in this office protocol.

A demographics form was provided to each patient and their guardian. This form was generated to gather information about the patient population. This included age at time of participation, parent or caregiver name, and best phone number to be reached. Further information collected on the form with a multiple-choice answer included the following: (a) gender, (b) race, (c) child's current living situation, (d) Supplemental nutrition assistance program (SNAP). SNAP benefits allow low-income families assistance with access to food benefits to supplement their overall grocery and the provider felt this to be an important inclusion (Family and Social Services Administration, 2024). Each multiple-choice answer was then allotted the option of "prefer not to answer" and "other" with a space to fill in their answer of choice. See Appendix B which lists the demographics form provided to participants and their caregivers upon agreement to the project.

Intervention

To prepare for this EBP project the PL sought out educational materials recommended by the literature review as part of the ADHD educational packet. The materials in this packet included: (a) prescribed medication including stimulants and if need be due to intolerance a non-stimulant medication (b) behavioral therapy referrals based on provider and insurance pairing, pamphlets listing the importance and adherence to therapy (c) diets high in phenols with examples like the DASH and Mediterranean diet (d) daily exercise benefits. Material was presented to participants in a folder at their ADHD visit in September and October. If the initial visit was not performed by the PL, the PL then contacted participants on week one as the introductory phase to reinforce the packet. The introductory phase consisted of an overview of the contents in the packet. The PL maintained contact every two weeks with caregivers of the

participants to provide education reinforcement via the office telephone, while tailoring the interaction to meet the individualize the plan of care of each patient's educational needs, individual medication, understanding, and preference

Comparison

Pre-intervention NICHQ Vanderbilt scores were compared to 12-week or post intervention NICHQ Vanderbilt scores noting changes in scores for the primary outcome. Due to visit cancellations, holiday office schedules, and available visit times, some 12-week post intervention NICHQ scores were obtained via the office phone with the PL. Comparisons were made to enrollment or pre-intervention BMI scores obtained via the EMR to 12-week or post intervention BMI scores via the EMR to address the co-morbid obesity link to ADHD. BMI score will conclude the secondary outcome. Due to visit cancellations, office schedules, and available visit times, some post 12-week BMI scores were unable to be obtained at the participants following visit with the provider.

Outcomes

Primary outcomes were measured by comparing enrollment or pre-intervention NICHQ Vanderbilt scores to 12-week or post intervention NICHQ Vanderbilt scores noting any changes in scores. These changes were discussed with the parent or caregiver and shared with the office staff. Due to co-morbid risks associated with ADHD, secondary outcomes included comparing enrollment or pre-intervention BMI scores via the EMR with 12-week or post intervention BMI scores via the EMR. Measures to assess outcomes were based on the NICHQ Vanderbilt score both pre and post office protocol intervention. Since each subject will be measured twice for both the primary and secondary outcome, the pre-NICHQ Vanderbilt scores were compared to the post-NICHQ Vanderbilt score of each participant. Data was analyzed by Gregory Gilbert using the paired T-test, this PL's statistician. Multiple conversations with this statistician were discussed and reviewed throughout the project. BMI scores were compared using pre and post

intervention with the McNemar's test. First published in 1947 and created by Quinn McNemar, McNemar's test is a non-parametric test that will assess statistical significance between a dichotomous trait at two different points in time on the same population (Statistics Solutions, n.d.). Data was collected from the EMR upon the first ADHD visit (or week one) and on week (12-16 pending the last participant visit).

Time

The timeline for this project surrounded the course allotted time of 12 weeks based on each participant's entry date, with 4 participants having extended time. This EBP started on September 6, 2023, with a goal to end on November 12, 2023 (See Appendix I) and an actual ending date of January 25, 2025, due to visit cancellations, holiday schedules and office availability. Printing of informational material that was to be given to participants was completed prior to the recruiting participants. The 12-week timeline for this implementation process correlated with the return follow up visit the provider recommended for follow on ADHD patients and extended for some due to unforeseen happenings including visit cancellations, holiday schedules and office availability.

Protection of Human Subjects

In preparation of protecting human subjects, ethics training was completed by the PL on April 14, 2022. Training completed was provided by Collaborative Institute Training Initiative (CITI) training and the course was Social Behavioral Educational researchers. See Appendix H for the copy of the CITI training certificate. No IRB approval was necessary for this EBP project as this project did not meet federal definition of research. To consider the rights of the participant, and to maintain participant privacy, the PL and nursing staff communicated with patients and families during the initial visit. To protect participant confidentiality, computer-based files were encrypted and signed documents were locked in a file cabinet behind a locked office door with the goal to remove personal identifiers. Participant anonymity was protected using

numeric codes instead of patient names or medical records during information gathering and statistical analysis.

CHAPTER 4

FINDINGS

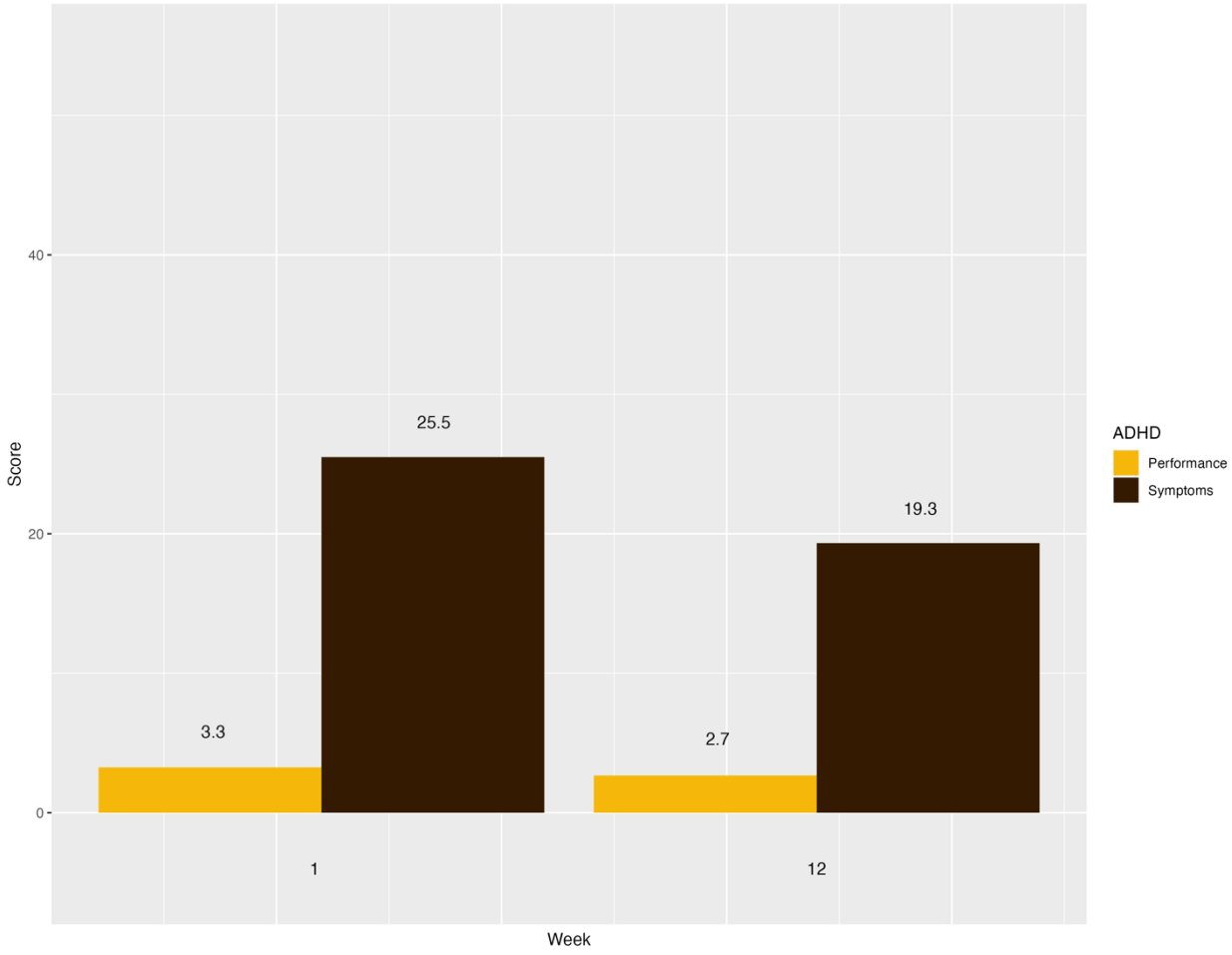
The purpose of this evidenced based project was to implement a holistic office protocol that addresses the chronicity and future health outcomes of children and adolescents, ages 2-17 who are diagnosed with ADHD. The intervention implemented was a holistic office protocol, supported by guidelines, that provided ADHD patients stimulant or non-stimulant medication prescriptions, behavioral therapy referrals, and education surrounding diet, and exercise. The primary outcome measured a decrease in ADHD symptoms as measured by pre-intervention NICHQ Vanderbilt scores to post intervention NICHQ Vanderbilt scores. The secondary outcome measured pre-intervention BMI scores via the EMR with post intervention BMI scores via the EMR. The primary outcome was analyzed by statistician G. Gilbert, using a paired t-test. The secondary outcome was analyzed also using McNemar's test. This multimodal EBP determined there was no statistical evidence of a decrease in symptoms as measured by the Vanderbilt Symptoms scale (t=1.372(7), p=0.106) as the primary outcome. However, there was statistical evidence of a decrease in performance as operationalized by the Vanderbilt Performance scale (V=26, p=0.025). The secondary outcome determined there was no statistical evidence of a decrease in BMI (t=1.30(5), p=0.126). McNemar's test revealed no difference between obesity in the pre-intervention and the post-intervention (χ^2=0.571(1), p=0.450).

In Figure 2.1, this demonstrates mean Vanderbilt Symptom and Performance scores. Mean Vanderbilt Symptom scores decreased from 26 in Week 1 to 19 at the end of the project. However, Vanderbilt Performance scores ultimately remained steady at three between Weeks 1 and post intervention.

Figure 2.1 demonstrates mean Vanderbilt Symptom and Performance scores.

Figure 2.1

Stacked bar chart of Vanderbilt Symptom and Performance Scores for 8 participants in an evidence-based study to reduce ADHD symptoms and performance over a 12-week period in one office in Northwestern Indiana



Consequently, the PL noted weekly phone calls revealed challenges in each of the four arms of the project. Reported challenges in the medications arm of the project included the inability to obtain medication from the pharmacy due to a shortage of medication, forgetting to take the medication and deliberate holidays from the medication including school break and the weekend. The behavior therapy arm of the project included challenges such as extended wait times for initial appointments, family conflict with available clinic location, driving distance or time

of visit, and child or parental resistances to behavioral therapy. Many of the behavioral therapists required the initial visit to be in person and then would transition to subsequent telehealth visits. The diet arm of the project included dietary challenges like child resistance to new foods including those high in phenols, increased time spent shopping or cooking, caregiver lack of control of diet in relationship to settings other than the family home. Examples of alternate meal settings included time with family, friends, and school lunches. Challenges with the exercise arm of this multimodal project included difficulty with securing rides to and from activities due to family schedules, participants missing scheduled after school practice due to illness or family obligations and weather cancellations or scheduled events.

Participants

Nine participants enrolled in the project. One participant was lost to attrition and did not have post-intervention Vanderbilt scores and thus the observation was deleted. There were two observations for one student by teachers in the pre-intervention and not in the post-intervention and thus a comparison could not be done, and the observations were deleted. Two observations were deleted from BMI analysis as post-intervention BMIs were not recorded due to missed appointments. The number of participants included in this project totaled approximately 3.2% of the total number of patients who are diagnosed with ADHD in this clinic. Hence, 8 participants were included in this analysis. Participant demographics included their age at the start of the project, their race as identified by their parent or caregiver, with whom they lived at the start of the project, and whether the family household participated in SNAP benefits. Pre-intervention and post-intervention demographics remained unchanged, as the design was a one-group pretest posttest design (Campbell & Stanley, 1963). Participants' ages ranged from 6 to 15 years of age (M=11.9, SD = 3.4). The median age was 14. Most of the participants identified by their caregivers as white (38%) or other (38%). Most of the participants were male (75%).

Table 2.1 displays the demographics of the eight participants.

Table 2.1

Demographic characteristics of eight participants diagnosed with ADHD at one clinic in northwestern Indiana

Demographic Characteristic		Value
Female [*n* (%)]		2 (25)
Male [*n* (%)]		6 (75)
Age (years) [M (SD)]		11.9 (3.4)
Age (years) [Mdn (IQR)]		14 (4.5)
Race [*n* (%)]		
	African American	2 (25)
	White	3 (38)
	Other	3 (38)
Living with [*n* (%)]	Parents	6 (75)
	Grandparents	1 (12)
	Other	1 (12)
SNAP Participation [*n* (%)]	Yes	2 (25)
	No	6 (75)

Abbreviations: M=mean; SD=standard deviation;

Mdn=median; IQR=interquartile range; *n*=number

Changes in Outcomes

The primary outcome measured overall was decreased ADHD symptoms measured in post intervention NICHQ Vanderbilt scores. There was no statistical evidence of a decrease in symptoms as measured by the Vanderbilt Symptoms scale (t=1.372(7), p=0.106). However, there was statistical evidence of a decrease in performance as operationalized by the Vanderbilt Performance scale (V=26, p=0.025).

The secondary outcome measured was a decrease in post intervention BMI scores. There was no statistical evidence of a decrease in BMI (t=1.30(5), p=0.126). McNemar's test revealed no difference between obesity in the pre-intervention and the post-intervention (χ^2=0.571(1), p=0.450).

Statistical Testing and Significance

The primary outcome measured was a decrease in the ADHD symptoms measured by post intervention NICHQ Vanderbilt scores. Due to its power the Vanderbilt Symptoms and Performance scales were scored and assessed for normality using the Shapiro Wilk test. (Shapiro & Wilk, 1965). The Symptoms scale was judged to be normally distributed (W=0.912, p=0.368), the Performance scale was judged to not be distributed normally (W=0.812, p=0.038) There was no statistical evidence of a decrease in symptoms as measured by the Vanderbilt Symptoms scale (t=1.372(7), p=0.106). However, there was statistical evidence of a decrease in performance as operationalized by the Vanderbilt Performance scale (V=26, p=0.025). Figure 2.1 demonstrates mean Vanderbilt Symptom and Performance scores. Mean Vanderbilt Symptom scores decreased from 26 in Week 1 to the end of the project. However, Vanderbilt Performance scores remained steady at three between Weeks 1 and post intervention

The secondary outcome measured pre-intervention BMI scores via the EMR with post intervention BMI scores via the EMR. BMI were scored and assessed for normality (Shapiro & Wilk, 1965) and BMI was judged to be normally distributed (W=0.870, p=0.228). There was no

statistical evidence of a decrease in BMI (t=1.30(5), p=0.126). BMI scores as measured by the growth chart percentiles greater than 95% signal obesity, rendering this data to be nominal data. Since the data were paired data, the chi-square test was not used and McNemar's test was used. McNemar's test revealed no difference between obesity in the pre-intervention and the post-intervention (χ^2=0.571(1), p=0.450).

CHAPTER 5

DISCUSSION

This EBP project served the purpose of addressing the chronic future health outcomes of children and adolescents with a diagnosis of ADHD, through stimulant or non-stimulant medications, behavioral therapy referrals and education surrounding diet and exercise. An extensive review of literature was performed in detail after significant review of current clinical guidelines. Additional insight from the project leader (PL) allowed for a glimpse into what went well, strengths and limitations the PL faced during the implementation phase of this project, sustainability of this project, and the project conclusion including discussions with the team after completion of the project. The PL addressed how the EBP model chosen helped to guide the steps for project activities, project happenings and recommendations for future care of ADHD patients in an office setting.

Explanation of Findings

Prior to the implementation of this EBP project, the PL participated in ADHD visits and observed challenges faced through the ADHD lens. The primary outcome of this multimodal EBP project determined there was no statistical evidence of a decrease in symptoms as measured by the Vanderbilt Symptoms scale. However, there was statistical evidence of a decrease in performance as operationalized by the Vanderbilt Performance scale. This result was not surprising due to the relationship between the symptoms and performance being inverse. In theory, if the symptoms decrease, performance should improve and vice versa. The secondary outcome determined there was no statistical evidence of a decrease in participants BMI, resulting in no difference between obesity in the pre-intervention and the post-intervention. According to Campbell & Stanley (1963) if the pretest and posttest are made on different days, the events in between may have caused the difference (p. 7).

In contrast, the challenges faced by participants in each arm of the project between the pretest and the post-test may have negatively impacted the results. Weekly phone calls with caregivers proved to be valuable tools to explore the actual happenings each week and could have accounted for the differences between the pre-test and post-test. Challenges with the medication arm of the project included inability to pick up medication from the pharmacy due to a shortage of medication, forgetting to take the medication and deliberate medication holidays from the medication during school breaks or the weekends. The behavior therapy arm of this EBP project was the most challenging of this EBP project. Behavior therapy challenges included extended wait times for initial appointments, family conflict with available clinic location, driving to or the initial times of visit, and child or parental resistances to behavioral therapy. Many of the behavioral therapy facilities allowed for an initial in person visit followed up by online sessions. Even with this alternative scheduled, it proved to be the most challenging aspect of the project. The second challenge of the project was the diet arm. Dietary challenges included child resistance to new foods including those high in phenols, increased time spent shopping or cooking, and caregiver lack of control of diet in relationship to settings other than the family home. Examples of alternate meal settings included time with family, friends, and school lunches. Based on weekly phone calls, the physical act of daily exercise did not appear to be a problem due to many of the children having a recess and/or being involved in after school sports. However, some participants had difficulty securing rides to and from activities due to their family's schedules. They also missed after school practice due to personal illness, family obligations, weather cancellations.

Strengths and Limitations of the DNP Project

The Iowa EBP Model was used to steer this EBP project. This model encouraged the PL to perform critical thinking based on clinical problems associated with children and adolescents with ADHD.

Strengths

Several strengths were evident within this EBP project. First, this project began due to the PL's experience with ADHD and her passion related to children and families and the diagnosis of ADHD. This PL's enthusiasm allowed for discussions between the clinical team, participants, and their families, as well as a strong dedication to the success of this project. Prior to the fruition of this EBP project, the PL was able to identify opportunities for change through actual participation in ADHD visits with patients and their families. This time allowed the PL to become familiar with the ADHD patient population in this office setting. The EBP project was successful as the key stakeholders were committed to the success of this project.

Second, a thorough review of literature was conducted, and countless databases were searched with guidance from the Valparaiso University librarian. Several databases were reviewed to help to reveal excellent pieces of evidence. With the help of this student's advisor, sixteen pieces of evidence were finalized from the literature search.

Third, was the ability of this PL to adapt and change based on the individual participant's needs. The PL acted as a liaison between the caregiver and the team, she assisted caregivers with scheduling additional physician appointments based on increased symptoms. The PL intervened when families could not obtain medication due to local area shortages and assisted with calling multiple pharmacies, all while encouraging dietary suggestions based on Mediterranean recipes. The PL also empathetically listened during phone calls on weeks 2, 4, 6, 8,10,12 and provided reinforcement based on previous education as caregivers discussed the weekly challenges of having a child with ADHD.

As a result of the project, two families initiated creative means to combat medication adherence. One family used their cell phone alarm as a reminder to help their child take their medication as prescribed. They included the alarm on both the parent and the child's phones to instill culpability of care in their teenager. Another family shared how they recently purchased a

gadget that held medication from Amazon for approximately $70. This gadget would alarm that would not stop until the pill was removed. Another family struggled with obtaining their child's medication due to a pharmacy shortage. The PL's assisted with phone calls to multiple pharmacies and the prescription was transferred by the office staff to a pharmacy without a shortage. Lastly, to ensure the statistical evidence was correctly managed a statistician was included in the EBP project.

Limitations

Despite the many strengths of this project, several limitations were encountered. Challenges during the recruitment phase dealt with scattered appointment times and the holiday seasons. ADHD appointments were scheduled at the convenience of the caregiver and office availability. This required the PL to rely on staff for recruitment at times as these times conflicted with the PL's work schedule. Several patients were missed during recruitment due the full workload of the high patient population at this office. The scattered appointment times made for a laborious recruitment phase. Two caregivers declined participation on the spot. They preferred to speak with their spouse and would contact the office if they decided to participate.

The gold standard to manage ADHD symptoms included prescriptions for stimulant medication or non-stimulant medication due to intolerance and behavioral therapy referrals by the primary practitioner. Additional research also suggested the use of increasing phenols in the diet, with examples like the DASH and Mediterranean diet and daily exercise to further manage ADHD symptoms. The most significant limitation was that some of the families did not want to the adhere to the medication regimen (stimulant or not), did not want to initiate, or follow through with behavioral therapy referrals, and did not include phenols with meals or allow time for exercise, which would help to benefit their child or adolescent with ADHD. In response, the PL reinforced education, encouraged accountability and continued use of tracking surrounding each arm of the project to facilitate conversations during phone call check-ins.

Limitations with the medication arm of treatment included inability to secure stimulant prescription due to a shortage of the medication, rendering participants without medication. Due to the phone call check ins this information was revealed as the caregiver had not reached out to the provider. This participant had to reroute their prescriptions to a pharmacy who had the medication in stock. Behavior therapy referrals were based on insurance pairing, practitioner availability, time of day and location of the office. Each participant and their caregiver were given a referral to behavioral therapy upon agreement into the project. Some of the participants had previous behavioral referrals that had expired, the PL discussed this with the team and these referrals were reissued. After referrals were reissued, participants' caregivers were required to schedule initial appointments and follow ups with a behavioral therapist. Per caregiver accounts, none of the participants had previously attended behavioral therapy. Participant's dependency on a caretaker or guardian posed another limitation to this project. Participants were all minors, and appointment times, rides, and medical care were at the availability of their caregiver. Several participants had missed appointments due to caregiver/participant illness, unexpected family changes with siblings, or work schedule conflicts. Weekly calls were intermittently unsuccessful due to family events, participant's sporting events, and caregiver/participant illness. One participant's caregiver was hospitalized, and another participant's caregiver had an ill family member they were caring for daily.

Other unexpected confounding factors included a day where participant appointments had to be rescheduled by the office due to the malfunctioning of the electronic medical records (EMR) system. Participant and/or provider vacations during both Thanksgiving and Christmas break also limited appointment slots and hindered scheduling.

Lastly, this study was underpowered. This manifested in no statistical difference in symptoms as the primary outcome. To the naked eye, the numbers appeared to show a difference, but once calculations were performed by the statistician this did not reveal a statistical

difference. It should be noted that research and evidence-based practice studies handle extraneous variables differently. It is not the goal of evidence-based practice project to control for extraneous variables as this is the goal of effectiveness studies (Portela et al., 2015). The majority of contemporary research adheres to a reductionist paradigm (Descartes, 1637) where it is the goal to control or measure all confounding variables or covariates thought to be relevant to the research question. In evidence-based practice studies it is the tradition to acknowledge the extraneous variables, but not attempt to interfere with the environment or system under improvement. EBP projects dictate, because of practicality, goal (that being results that are not generalizable), or sample size researchers recognize complete control of extraneous variables to be impossible, impractical, and not applicable taking an approach so as not to get bogged down in the excessive data collection required when controlling for extraneous variables (Etchells et al., 2016; Etchells & Woodcock, 2018). However, investigators must take a practical approach and realize a sufficient sample size is needed to detect a difference for their primary outcome. To this end, when results were found that this did not show statistical evidence of a difference, despite the literature advising against it, retrospective sample size calculations were conducted (Gilbert & Prion, 2016).

The primary outcome identified was ADHD symptoms. To this end, several sample size calculations were done all using the sample parameters: a standard deviation of 15.08, alpha=0.05; a paired, two-sided t-test. Sample size calculations were adjusted for nonparametric methodology by dividing by 0.85 and inflated 20% to account for attrition(Lehmann & D'Abrera, 1998). See Table 3.1 below.

Although before doing the sample size calculations investigators knew this pedagogical evidence-based project was underpowered, it did serve its purpose to instruct the student on the process of conducting an evidence-based project and thus can be deemed a success (Gilbert & Prion, 2016). Had *a priori* sample size calculations been done, even recruiting 105 patients would have been a formidable task. The results of the limitation were directly evident in that it was not possible to detect statistical evidence of a decrease in ADHD symptoms; however, the evidence-based practice project was a success as a pedagogical exercise.

Sustainability

Sustainability of this project was discussed prior to fruition of the project and at the end of the project with the physician and nurse in the office. The participant phone calls were made at weeks 2, 4, 6, 8, 10, 12 and took time and effort by the PL. Unfortunately, the amount of time and manpower is not built into the facility hours and was feasible in PL's work schedule. This project will be difficult to sustain as designed but is possible if manpower hours that went into the weekly contact of patients was available. Pamphlets utilized in the office protocol were donated to the office as a way to create conversations between the provider, patients, and their families surrounding ADHD and the research. These 100 pamphlets were $56.98 and long-term costs may need to be in a future budget discussion within the healthcare facility.

If the opportunity to redo the project presented itself, participant and caregiver contact may have been decreased to weeks 4, 8, 12 to prevent participant burden and increase adherence. In hindsight, the PL noticed trends in the phone calls with the participants and caregivers related to each arm of the project. Calls revealed how real-life happenings interfered with the ADHD management of the participants. Hence, future comparable projects should include computations to determine the statistical significance if any regarding this data.

Relevance for EBP Model

The model chosen to steer this project was the Iowa Model of Evidence Based Practice. This model is based in the nursing discipline and provides a framework of seven steps to achieve success. Each step of this model was essential to this EBP project. Step (a) identification of triggers or opportunities for change was noted during the PL's clinical rotation in this pediatric office. From here, steps (b) stating the question or purpose took many revisions to incorporate multiple pieces of evidence. Step (c) formation of a team flowed easily. Step (d) assembling, appraising, and synthesizing of the evidence was a huge piece of this project and included many hours of research and was the foundation of this EBP project. Step (e) formation of the design was not met to the full potential, as no pilot was initiated. Steps (f) integrating the practice changes, and (g) a dissemination of the results were the active pieces of the project. Both of these steps required dedication and critical thinking to ensure data was accurate. To ensure this accuracy, a statistician was used to calculate statistics and dissemination of findings.

Recommendations for the Future

The etiology of ADHD is complex. Updated AAP guidelines (2019) emphasize that ADHD is a chronic condition and recommends practitioners attempt to understand the unique family dynamics of their patients. Addressing the family unit is helpful when treating pediatric patients with ADHD.

Further research is needed to address the positive benefits of an office protocol that addresses the chronic nature of ADHD surrounding the use of stimulant medication or non-stimulant medication if not tolerated, a referral for behavior therapy, education surrounding a diet in phenols and daily exercise**.**

Research

Continued research should focus on additional ways to manage ADHD symptoms, improve performance as scored by the Vanderbilt follow up form, and prevent future health

complications related to ADHD, like obesity. Additionally, more high-level evidence surrounding ADHD would add to the body of knowledge. Next, as a first line adjunct to stimulant medication, behavioral therapy barriers hinder patient care. Research that addresses barriers to behavioral therapy should be explored. In fact, the CDC (2023c) noted adequate management should include ongoing monitoring of the current treatment plan and include changes to the plan along the way if it is ineffective. Future studies should include sample size calculations for the primary outcome, adjustment for non-parametric methodology, and adjustment for attrition. Hence, research should also include ongoing monitoring and address the treatment plan including changes made throughout the plan.

Education

When caring for patients with ADHD, education focused on a holistic approach to care should be incorporated in the management of these patients, with an emphasis on the chronicity of this condition. Education surrounding the benefits of medication adherence, behavioral therapy, dietary strategies, and daily exercise to manage symptoms and combat future comorbid conditions like obesity should be evaluated at a greater depth. Nurse practitioners (NP) should be aware of the need for an increased interaction and communication with ADHD patients and their caregivers. Also, practitioners should consider how ADHD can affect the entire family unit when thinking from a family health lens.

Conclusion

The incidence of children with ADHD in Indiana is 10.2 %, while neighboring states reveal Illinois 8.4%, Michigan 9.7%, and Ohio 10.2% (CDC, 2023b). Forgetfulness due to unmanaged symptoms experienced by children with ADHD including impulsivity and inattention may lead to further health risks like obesity (CDC, 2023c). Therefore, management of symptoms is key to caring for patients diagnosed with ADHD. Clinical practice guidelines recommend spending more time with ADHD patients and families to develop a comprehensive plan of care (Wolraich et al.,

2019). Although, challenges faced by healthcare can hinder the long-term management of ADHD pediatric patients. Provider shortages add to the burden of their care as do time barriers place on their daily practice, which can limit patient education time. Offering patients diagnosed with ADHD a holistic office protocol that addresses the chronicity of this condition assists with managing these patients.

An office protocol allows for a concise presentation of education that can be taken home to be conveniently reviewed, it allows for patient or caregiver accountability, involvement, and tracking. Lastly, an office protocol offers a way to initiate patient and/or caregiver conversations with their providers so that interventions are based on individual patient feedback. This holistic approach caring for children and adolescents with ADHD considers the patient as the individual and includes the family unit in the management of care.

Table 3.1

Sample size calculations for ADHD symptoms adjusting for nonparametric methodology and attrition

Symptoms Difference	Cohen's *d*	Patients	Adjusted Sample Size
2	0.133	449	634
3	0.199	201	284
4	0.265	114	161
5	0.331	74	105

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AUTOBIOGRAPHICAL STATEMENT

Ms. Kimberly Olmos graduated from Purdue University Calumet in 1998 with an Associate Degree in Nursing (ASN). She worked for various units at Franciscan Health including renal telemetry, cardiac care, labor and delivery. She also worked as a home-health nurse, which allowed her to see the needs of patients and their families beyond the bedside. These experiences led her to pursue a Bachelor of Science in Nursing (BSN) from Valparaiso University in 2009. Over the next nine years, she worked at an outpatient post anesthesia care unit (PACU), became a school nurse coordinator, led as a charge nurse on a medical-surgical unit, and became a clinical instructor. In 2017, she expanded her scope to work in the emergency department (ED). While in the ED, she obtained certifications in Advanced Cardiac Life Support (ACLS), Pediatric Advanced Life Support (PALS), Trauma Nursing Core Course (TNCC), and Emergency Nurse Pediatric Course (ENPC). Ms. Olmos passion to pursue a higher degree in nursing led her back to Valparaiso University in 2018 to earn a Master of Science in Nursing (MSN) with a focus on education. She taught future nursing students both at the bedside and in didactic courses. While in academia, she organized vision and hearing screenings at local elementary schools, acted as a mentor during an interprofessional educational experience (IPE) and integrated nursing students into COVID screenings and vaccination clinics. Ms. Olmos's pursuit of a Doctor of Nursing Practice (DNP) degree came from her passion to grow within her profession and her desire to make a difference in the world. As a graduate student, she was accepted into Sigma Theta Tau International and in 2022, she received the Calling and Character Student Scholarship from the Institute for Leadership and Service (ILAS) at Valparaiso University. Ms. Olmos will graduate in May 2024. Although she has not yet accepted a position, she is open to her new journey.

ACRONYM LIST

AGREE II: Appraisal of Guidelines for Research and Evaluation II

AAP: American Academy of Pediatrics

ADHD: Attention Deficit Hyperactivity Disorder

CASP: Critical Appraisal Skills Programme

CINAHL: Cumulative to Nursing and Allied Health Literature (CINAHL)

CITI: Collaborative Institute Training Initiative

DSM-5: Diagnostic and Statistical Manual of Mental Disorders

EMR: Electronic medical record

EBP: Evidenced-based practice

FNPs: Family Nurse Practitioners

HIPPA: Health Insurance Portability and Accountability Act

IQR: Interquartile range

JBI: Joanna Briggs Institute

M: mean

Mdn: median

MFO: Melnyk, B. M. & Fineout-Overholt, E

NICHQ: National Institute for Children's Health Quality

PL: The project leader

RCTs: Randomized Control Studies

RN: Registered Nurse

SD: standard deviation

TRIP: Turning Research into Practice

US: United States

UK: United Kingdom

VU IRB: University's Internal Review Board

APPENDIX A
REVIEW OF LITERATURE GRID

Citation (APA)	Purpose	Design/Sample	Interventions	Measurement/ Outcomes	Results/Findings
Attention deficit disorder: Diagnosis and management. (2019). NICE guidelines NG87. www.nice.org.uk/guidance/ng87	To provide healthcare professionals commissioners, and providers and people with ADHD, their families and care - givers guidance on treatment and management of ADHD	Clinical Practice Guideline in the UK	Provides direction on diagnosis and management for ADHD diagnosis	Established best guidelines for practice	Medications are recommended as treatment for children over 5 years of age Regularly discuss how ADHD children and their families can be involved in the treatment plan Educate on benefits of a healthy lifestyle including exercise The committee emphasized a holistic approach to managing ADHD Offering patients ADHD focused support
DynaMed. Attention Deficit Hyperactivity Disorder (ADHD) in Children and Adolescents. EBSCO Information Services. Accessed June 27, 2023. https://www.dynamed.com/condition/attention-deficit-hyperactivity-disorder-adhd-in-children-and-adolescents	Purpose is to establish CPGs on ADHD in children and adolescents.	Clinical practice Guidelines/ Evidence Summary	Review of high-level evidence, using like terms and a rating system	Examined evidence surrounding the clinical practice guidelines from the United States, United Kingdom, and Canada	Kids 4-5 first treat with parent/ teacher behavioral therapy and consider Methylphenidate if behavioral interventions do no improve symptoms Ages 6-11, first line treatment is FDA approved stimulants and combination of medication and behavioral therapy

					Ages 12-18, first line treatment is FDA approved medication and combination of behavioral therapy and medication Dietary restriction of synthetic food colors may be associated with improvement of parentally reported ADHD symptoms in children Avoiding foods and drinks with certain artificial colors and/preservatives such a tartrazine and sodium benzoate may prevent increased symptoms in ADHD kids
Papanastasiou, G., Drigas, A., & Papanastasiou, P. (2021). The association of diet quality and lifestyle factors in children and adults with ADHD: A systematic review and meta-analysis. *Scientific Electronic Archives,14*(9)https://doi.org/10.36560/14920211441	Purpose was to systematically review evidence for its relationship between diet quality and three lifestyle factors: physical activity, sleep and stress on children and adults with ADHD	Systematic Review & Meta Analysis n=14 Including case controls (8), cohorts (5), cross sectional (1)	Systematic search with like terms in PubMed and Scopus	Cochrane collaboration tool was used to assess risk bias prior to inclusion of material	Pooled Analysis revealed a high-quality diet decreases the prevalence of ADHD in children OR 0.43%, 95% CI:0.28-0.70, while a poor diet is associated with higher prevalence of ADHD in children and adults OR 1.90, 95% CI: 1.43-2.61
Wolraich, M.Hagan, J., Allan, C., Chan, E., Davidson, D., Earls, M., Evans, S., Flinn, S., Froehlich, t., Frost, J., Holbrook, J., Lehmann, C., Lessin, R., Okechukwu, K., Pierce, K., Winner, J.,& Zurhellen, W.(2019). Clinical practice guideline for the diagnosis, evaluation and treatment of Attention Deficit Hyperactivity Disorder in children and adolescents. *Pediatrics 144,* (4) e20192528. https://doi.org/10.1542/peds.2019-2528	Purpose was to establish guidelines when caring for pediatric patients with ADHD	Academy of Pediatrics			First line treatment for children ages 12-18 prescribe FDA approved medications with dolescent assent

Guevara, J. P., Power, T. J., Bevans, K., Snitzer, L., Leavy, S., Stewart, D., Broomfield, C., Shah, S., Grundmeier, R., Michel, J. J., Berkowitz, S., Blum, N. J., Bryan, M., Griffis, H., & Fiks, A. G. (2021). *Improving Care Management in Attention-Deficit/Hyperactivity Disorder: An RCT. Pediatrics, 148*(2), 1–9. https://doi-org.ezproxy.valpo.edu/10.1542/peds.2020-031518	To compare the effectiveness of EHR (portal alone) with HER and care manager for communicating among children with ADHD.	Randomized Control Trial (RCT) at 11 primary care practices on children ages 5-12 with ADHD n= 273 over a 9-month time frame	2 randomly assigned parent groups: 1. EHR/portal alone 2. EHR/portal & care manager that included family treatment preferences, ADHD signs and symptoms, ADHD education, parental support	demographics primary outcome: changes in ADHD symptoms via the Vanderbilt Parent Rating Scale Secondary outcome measured changes in goal attainment and PROs	Although care management combined with patient portal did not decrease symptoms Children with >/=2 care management sessions or Families with greater care management demonstrated greater reductions than those with less engagement
Khoshbakht, Y., Moghtaderi, F., Bidaki, R., Hosseinzadeh, M., & Salehi-Abargouei, A. (2021). The effect of dietary approaches to stop hypertension (DASH) diet on attention-deficit hyperactivitydisorder (ADHD) symptoms: A randomized controlled clinical trial. *European journal of nutrition, 60*(7), 3647–3658. https://doi.org/10.1007/s00394-021-02527-x nutrition, 60(7), 3647–3658. https://doi.org/10.1007/s00394-021-02527-x	Purpose was to investigate the DASH diet on ADHD children ages 6-12	RCT design Children ages 6-12 years n=80	2 groups randomly assigned to consume DASH diet or control Diet consisting of with a breakdown of CHO 50%, Fats 25-30%, Protein 15-20% for 12 weeks	Severity of ADHD symptoms were measured by Abbreviated 10 item Conner's Scale (ACS), 18-item Swanson, Nolan and Pelham (SNAP-IV) scale Strengths and difficulties questionnaire (SDQ) was measured every 4 weeks Estimated energy requirements were measured (EER)	Abbreviated 10 item Conner's Scale (ACS) scored improved Strengths and difficulties questionnaire (SDQ) scores were improved Adherence to the DASH diet might be effective in improving ADHD symptoms
Darabi, Z., Vasmehjani, A. A., Darand, M., Sangouni, A. A., & Hosseinzadeh, M. (2022). Adherence to mediterranean diet and attention-deficit/hyperactivity disorder in children: A case control study. *Clinical Nutrition ESPEN, 47*, 346-350. https://doi.org/10.1016/j.clnesp.2021.11.014	Investigate the association between adherence to Mediterranean diet and odds of ADHD in Iranian children	Case-control study, children ages 7-13 in Iran n=360	2 groups: newly diagnosed and control	Validated food frequency questionnaire to measure food intake Association of adherence to Mediterranean diet with odds ratios of ADHD were examined via logistic regression software	Children with higher adherence to Mediterranean diet had a lower OR 0.49 95% CI, 0.27-0.89 compared to children with a lower adherence to the Mediterranean diet. Mediterranean Diet consisting of vegetables, legumes, fruits, nuts, grains and fish could decreased the odds of ADHD in primary school children
Darzi, M., Abbasi, K., Ghiasvand, R., Akhavan, T., & Rouhani, MH. (2022). The Association between dietary polyphenol intake and attention deficit hyperactivity disorder: A case-control study. *BMC Pediatric 22(*1):700. doi: 10.1186/s12887-022-03768-3. PMID: 36474220; PMCID: PMC9724259	Purpose was to determine if there was a relationship between dietary polyphenol intake and	Case control design. Children ages 4-12 years old, n=400	Anthropometric measurements were taken, including BMI. Patients self-reported: dietary	General characteristics and BMI were measured Energy adjusted dietary intake of both groups were measured and reported in units	1 unit increase in polyphenols in dietary intake could reduce the risk of ADHD in children Increased dietary polyphenol intake was associated with reduced risk of ADHD symptom

	ADHD risk in pre-school and elementary kids	200 ADHD patients recruited from psychotherapy clinics were 200 non-ADHD patients recruited from preschool and elementary schools in Iran	intake was examined used a 168-item semiquantitative interviewer-administered food frequency questioner by a team of nutritionist	FFQ (self-reported dietary assessment tool) that was led by a semi-quantitative-interview	
Del-Ponte, B., Quinte, G. C., Cruz, S., Grellert, M., & Santos, I. S. (2019). Dietary patterns and attention deficit/hyperactivity disorder (ADHD): A systematic review and meta-analysis. *Journal of Affective Disorders*, *252*, 160–173. https://doi-org.ezproxy.valpo.edu/10.1016/j.jad.2019.04.061	Purpose was to systematically examine the evidence on the association between ADHD and dietary patterns	Systematic review/Meta-analysis n=14 Paired reviewers performed selected designs included: observational & cross sectional (5), cohort, (4) and case-control studies (5)	Like terms were searched, in multiple data bases Then, articles were reviewed, and inclusion articles were chosen	2 meta-analyses were performed The first assessed the effects of unhealthy food consumption on ADHD The second assessed the effects of healthy food consumption on ADHD	Provides an association between diet and ADHD 1. Diets high in refined sugar and saturated fat can increase the risk of ADHD symptoms compared to a diet with high vegetable and fruit consumption would protect against ADHD or hyperactivity
French, B., Sayal, K., & Daley, D. (2019). Barriers and facilitators to understanding of ADHD in primary care: A mixed-method systematic review. *European Child & Adolescent Psychiatry*, *28*(8), 1037–1064. https://doi-org.ezproxy.valpo.edu/10.1007/s00787-018-1256-3	Purpose was establish a synthesis of barriers and facilitators with regards to attitudes, beliefs and experiences with ADHD within primary care	Systematic review (Mixed method)of peer reviewed of both quantitative and qualitative studies	Electronic search of multiple databases with like terms n=48 Including cohort, case-control and RCTs	Articles quality was measured following Kmet, Lee and Cook's guidelines and scored 0-1 Scores were classified into low (0-0.44), moderate (0.45-0.69), high (.70-1.00) Assessed by 2 reviewers, 2 studies not used for lows quality rating scores.	Average quality scores showed variation with an average of 0.73 and 36/48 studies were high quality Four main themes identified: 2. Need for education, 3. misconception on stigma, 4. constraints with recognition, management and treatment 5. need for multidisciplinary approach
Goode, A. P., Coeytaux, R. R., Maslow, G. R., Davis, N., Hill, S., Namdari, B., Allen LaPointe, N. M., & Befus, D. (2018). Nonpharmacologic Treatments for Attention-Deficit/Hyperactivity Disorder: A systematic	To assess the comparative effectiveness of nonpharmacological	Meta-analysis of RCTs and observational studies N=54	Searched multiple databases with like terms from 2009-2016	Methodological quality was measured using Cochrane Risk of Bias tool for randomized studies and the New Castle Ottawa	Significant gaps in knowledge regarding the effectiveness of ADHD and nonpharmacological uses including use of neurofeedback, cognitive training, cognitive behavioral therapy, child or parent training,

review. *Pediatrics*, *141*(6), 1–12. https://doiorg.ezproxy.valpo.edu/10.1542/peds.2018-0094	treatments for ADHD in kids 17 years old or younger		Pairs of investigators screened titles and abstracts Two reviewers independently reviewed articles and disagreements were settled via third party involvement	Scale for observational studies	dietary omega fatty acid, herbal or dietary approaches
Odhiambo, Mercy Atieno. Attention Deficit Hyperactivity Disorder Diet Therapy. (2022). Retrieved from http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=jbi&NEWS=N&AN=JBI19631 .	Purpose was to examine the best evidence regarding dietary therapy for managing ADHD in children	Integrative review	Review of evidence from CPGs (1), Meta-analysis (14), Mixed designs (11), Longitudinal observational study (1), Case control (1), RCTs (244)	Dietary therapy for managing ADHD in children	Healthcare professionals should advise ADHD children and families that a balanced diet with high fruits and vegetables, low fat dairy and low amounts of simple sugars may decrease hyperactivity and emotional symptoms, but are not curative. A food diary may be a useful tool to monitor foods and drinks that trigger hyperactive symptoms If links are found between food and symptoms, children should be referred to a dietician and a multidisciplinary approach should be used
Fotoglou, A., Moraiti, I., Diamantis, A., Stergios, V., Gavriilidou, Z., & Drigas, A. (2022). Nutritious diet, physical activity and mobiles. The game changers of ADHD.*Technium BioChemMed 3(*2), 86-107	Purpose was to record data on the implementation of diet and exercise programs in the world on children with ADHD	Literature Review from Greece		Data surrounding ADHD, diet, exercise, and mobile APP was reviewed	Inclusion of nutrition and physical activity are often overlooked by parent, therapists, and educators and inclusion would be beneficial as part of holistic approach to care for children with ADHD Results showed dietary interventions and physical activity programs applied in many countries detail a positive result in a all aspects of behavior in children with ADHD Improving nutritional and physical conditions of children with ADHD will help to increase QOL and more positive emotional regulation
Jerome, D., & Jerome, L. (2020). Approach to diagnosis and management of childhood attention deficit hyperactivity disorder. *Canadian Family Physician*, *66*(10), 732–736	To provide primary care clinicians with means to diagnose and manage	Narrative Review of PubMed, CPS, American Academy of	PubMed search with MeSH terms attention deficit disorder and family practice in the last 15 years and		Diagnosed via DSM-5 criteria Stimulants are first line treatment in 6 years and older Behavioral treatment is first line management in all patients

	ADHD through summarizing CPGs and recent evidence	Pediatrics and CADDRA.	literature was reviewed		
Pinto S, Correia-de-Sá T, Sampaio-Maia B, Vasconcelos C, Moreira P, Ferreira-Gomes J. (2022). Eating patterns and dietary interventions in ADHD: A narrative review. *Nutrients*. 14(20):4332. doi: 10.3390/nu14204332. PMID: 36297016; PMCID: PMC9608000	Purpose was to examine which dietary patterns are most associated with ADHD and to summarize the existing evidence for the clinical use of dietary interventions on ADHD	The design is a Narrative Review of RCTs, systematic reviews and meta-analysis	Examination of the ADHD and dietary patterns	Provided description and critical reflection of the current knowledge of the highest levels of evidence (RCTs, systematic reviews and meta-analysis)	Non-healthy dietary patterns were positively associated with ADHD ("junk food, processed food, sweet and western food") Healthy eating patterns were negatively associated with ADHD (Mediterranean diet, DASH diet, diet high in fruits and vegetables)
Schroer, M., Haskell, B., & Rose, V. (2021). Treating child and adolescent Attention-Deficit/Hyperactivity Disorder and behavioral disorders in primary care. *The Journal for Nurse Practitioners, 17*(1), 70-75. https://doi.org/10.1016/j.nurpra.2020.08.007	Purpose was to provide guidance on treatment of children and adolescents with ADHD for primary care providers	Narrative Review			Stimulants are the gold standard for treatment Recommendations for referral to behavioral therapy

APPENDIX B

ADHD Office Protocol
Demographics Form
Valparaiso University

Part 1: Please fill in the blanks below. All information will be kept confidential.

Today's date: _____

Parent/ caregiver name: _____

Child's Name: _____

Best Phone number to be reached: _____

Child's Age: _____

Part 2: Please Circle Your Response Below

Child's Gender: (circle your response)

Male Female Other: _____ Prefer not to answer

Race (circle your response)

American Indian/ Alaskan Native Asian Black/African American

Native Hawaiian/ Pacific Islander Other Race White

Child's Current Living Situation (circle your response)

With Parents(s) With Grandparent(s) Other_____

Prefer Not to Answer

Does the Household Receive SNAP Benefits (circle your response)

Yes No Prefer Not to Answer

Thank you for your participating in the office protocol. If you have any questions, please feel free to contact the office.

APPENDIX C

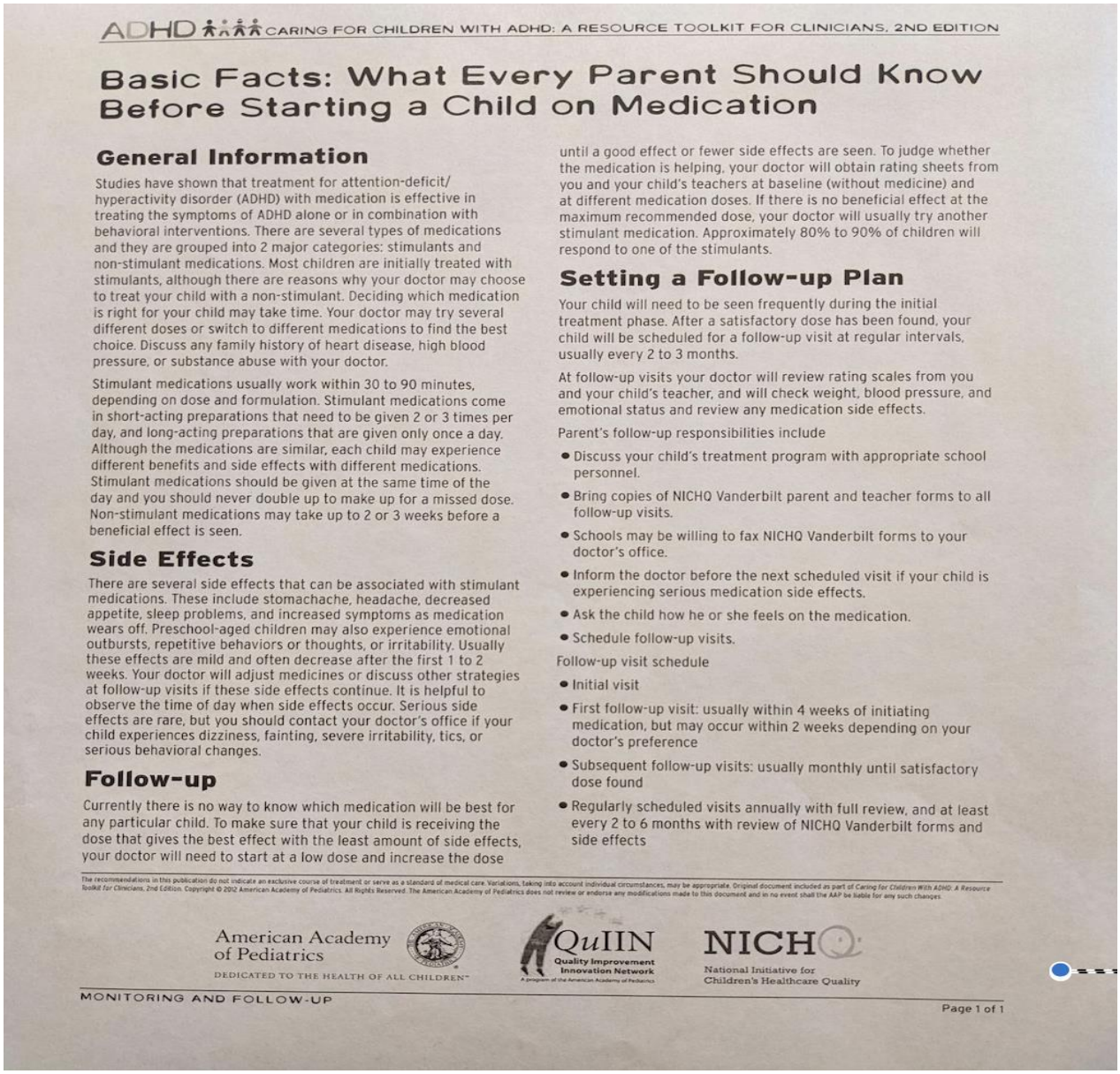
ADHD Office Protocol Checklist

Week of _____	**Did you take your ADHD medication?**	**Did you attend behavioral therapy this week?**	**Did you exercise 20-30 minutes today?**	**Did you notice any food that made ADHD symptoms worsen? ***	**If yes, then please list the foods eaten in the last 4 hours prior to symptoms worsening. ***	Please note any additional observations
Monday	yes or no	yes or no	yes or no	yes or no		
Tuesday	yes or no	yes or no	yes or no	yes or no		
Wednesday	yes or no	yes or no	yes or no	yes or no		
Thursday	yes or no	yes or no	yes or no	yes or no		
Friday	yes or no	yes or no	yes or no	yes or no		
Saturday	yes or no	yes or no	yes or no	yes or no		
Sunday	yes or no	yes or no	yes or no	yes or no		

*= more information needed

APPENDIX D

Medication Education (packet)



Basic Facts: What Every Parent Should Know Before Starting a Child on Medication

General Information

Studies have shown that treatment for attention-deficit/hyperactivity disorder (ADHD) with medication is effective in treating the symptoms of ADHD alone or in combination with behavioral interventions. There are several types of medications and they are grouped into 2 major categories: stimulants and non-stimulant medications. Most children are initially treated with stimulants, although there are reasons why your doctor may choose to treat your child with a non-stimulant. Deciding which medication is right for your child may take time. Your doctor may try several different doses or switch to different medications to find the best choice. Discuss any family history of heart disease, high blood pressure, or substance abuse with your doctor.

Stimulant medications usually work within 30 to 90 minutes, depending on dose and formulation. Stimulant medications come in short-acting preparations that need to be given 2 or 3 times per day, and long-acting preparations that are given only once a day. Although the medications are similar, each child may experience different benefits and side effects with different medications. Stimulant medications should be given at the same time of the day and you should never double up to make up for a missed dose. Non-stimulant medications may take up to 2 or 3 weeks before a beneficial effect is seen.

Side Effects

There are several side effects that can be associated with stimulant medications. These include stomachache, headache, decreased appetite, sleep problems, and increased symptoms as medication wears off. Preschool-aged children may also experience emotional outbursts, repetitive behaviors or thoughts, or irritability. Usually these effects are mild and often decrease after the first 1 to 2 weeks. Your doctor will adjust medicines or discuss other strategies at follow-up visits if these side effects continue. It is helpful to observe the time of day when side effects occur. Serious side effects are rare, but you should contact your doctor's office if your child experiences dizziness, fainting, severe irritability, tics, or serious behavioral changes.

Follow-up

Currently there is no way to know which medication will be best for any particular child. To make sure that your child is receiving the dose that gives the best effect with the least amount of side effects, your doctor will need to start at a low dose and increase the dose until a good effect or fewer side effects are seen. To judge whether the medication is helping, your doctor will obtain rating sheets from you and your child's teachers at baseline (without medicine) and at different medication doses. If there is no beneficial effect at the maximum recommended dose, your doctor will usually try another stimulant medication. Approximately 80% to 90% of children will respond to one of the stimulants.

Setting a Follow-up Plan

Your child will need to be seen frequently during the initial treatment phase. After a satisfactory dose has been found, your child will be scheduled for a follow-up visit at regular intervals, usually every 2 to 3 months.

At follow-up visits your doctor will review rating scales from you and your child's teacher, and will check weight, blood pressure, and emotional status and review any medication side effects.

Parent's follow-up responsibilities include

- Discuss your child's treatment program with appropriate school personnel.
- Bring copies of NICHQ Vanderbilt parent and teacher forms to all follow-up visits.
- Schools may be willing to fax NICHQ Vanderbilt forms to your doctor's office.
- Inform the doctor before the next scheduled visit if your child is experiencing serious medication side effects.
- Ask the child how he or she feels on the medication.
- Schedule follow-up visits.

Follow-up visit schedule

- Initial visit
- First follow-up visit: usually within 4 weeks of initiating medication, but may occur within 2 weeks depending on your doctor's preference
- Subsequent follow-up visits: usually monthly until satisfactory dose found
- Regularly scheduled visits annually with full review, and at least every 2 to 6 months with review of NICHQ Vanderbilt forms and side effects

American Academy of Pediatrics
DEDICATED TO THE HEALTH OF ALL CHILDREN™

QuIIN Quality Improvement Innovation Network
A program of the American Academy of Pediatrics

NICHQ National Initiative for Children's Healthcare Quality

APPENDIX E

Behavioral Therapy (packet)

Behavior Therapy for Children with ADHD
An Overview

Behavior therapy is an important part of treatment for children with ADHD.

Attention-deficit/hyperactivity disorder (ADHD) can affect a child's ability to pay attention or sit still at school, and it also can affect relationships with family and other children.

Children with ADHD often show behaviors that can be very disruptive to others. ***Behavior therapy is a treatment option that can help reduce these disruptive behaviors****. It is often helpful to start behavior therapy as soon as problems are diagnosed.*

Behavior Therapy for ADHD

For younger children

Teaches parents, teachers, and other caregivers how to give children the support and structure they need.

For older children

Helps children recognize their symptoms and better manage their own behavior. Often includes parents and teachers.

What is Behavior Therapy?

The goals of behavior therapy are to encourage positive behaviors and discourage unwanted or problem behaviors.

Good treatment plans will include monitoring improvement closely and adjusting the therapy as needed along the way.

Types of Behavior Therapy

- **Parent training in behavior therapy**: Parents learn to use skills to better manage their child's behavior. Parents learn ways to strengthen their relationship with their child.
- **Behavior therapy with children:** The therapist works with the child to learn new behaviors to replace behaviors that cause problems. The therapist may also help the child learn to handle feelings in ways that do not create problems for the child or other people.

Behavior therapy can be individual or in groups. Teachers can also use behavior therapy to help reduce problem behaviors in the classroom.

Choosing Behavior Therapy at Different Ages

- Behavior therapy training for parents is effective for managing disruptive behavior in young children through age 12.
- The age when children are ready for their own therapy varies, but usually by about 8-10 years of age.
- For school-age children, parent training and behavior therapy with children can be very effective when used in combination.

Finding a therapist

Psychologists, licensed counselors, and licensed social workers can provide behavior therapy.

- Check professional association directories or health insurance provider directories.
- Review the therapists' profile or call and ask about their approach to ADHD treatment.

American Academy of Pediatrics:
Treatment Recommendations for ADHD

Age 4-5 years	Age 6 and up
Behavior therapy first, before trying medication	Behavior therapy and medication, preferably together

For more information on ADHD, behavior therapy, and finding a provider, visit http://www.cdc.gov/ncbddd/adhd/behavior-therapy.html

National Center on Birth Defects and Developmental Disabilities
Division of Human Development and Disability

Behavior therapy for young children with ADHD

Finding a Therapist

Behavior therapy is an ef ective treatment for attention-def cit/hyperactivity disorder (ADHD) that can improve a child's behavior, self-control, and self-esteem. It is most ef ective in young children when it is delivered by parents. When parents become trained in behavior therapy, they learn strategies to help their child with ADHD succeed at school, at home, and in relationships. Families can use the following information to help f nd therapists who provide behavior therapy training for parents of young children with ADHD.

How do I f nd a therapist who trains parents in behavior therapy?

Psychologists, social workers, and licensed counselors can provide this kind of training for parents. Therapists may be found through online provider directories (such as the American Psychological Association Psychologist Locator*, the American Association of Marriage and Family Therapy Locator**, or other professional association directories), or through health insurance provider directories. Parents can review the therapist's online prof le or call and ask the therapist to describe their approach to ADHD treatment.

What should I look for?

Families should look for a therapist who focuses on training parents. Some therapists will have training or certif cation in a program that has been proven to work in young children with ADHD. Such programs include those listed in a 2011 Agency for Healthcare Research and Quality (AHRQ) report***:

- Parent-Child Interaction Therapy (PCIT)
- Incredible Years Parent Program
- Triple P – Positive Parenting Program
- New Forest Parenting Programme

While these may not be available in all areas, other programs have also been tested and found to work in children with ADHD. This list of questions can be used to f nd a therapist who uses a proven approach:

Does this therapist:

- ☐
- ☐
- ☐
- ☐
- ☐

* American Psychological Association Psychologist Locator, http://locator.apa.org

** American Association of Marriage and Family Psychologist Locator, https://www.aamft.org/Directories/Find_a_Therapist.aspx

*** Charach A, Dashti B, Carson P, Booker L, Lim CG, Lillie E, et al. Attention Def cit Hyperactivity Disorder: Ef ectiveness of Treatment in At-Risk Preschoolers; Long-Term Ef ectiveness in All Ages; and Variability in Prevalence, Diagnosis, and Treatment. Rockville, MD: Agency for Healthcare Research and Quality; 2011.

National Center on Birth Defects and Developmental Disabilities
Division of Human Development and Disability

APPENDIX F

Mediterranean Diet Education (packet)

MEDITERRANEAN DIET PYRAMID

Here's how to follow this visual guide to the Med Diet, from the bottom (most important!) on up. Base your meals mostly on a variety of foods nearest the base of the pyramid.

- Look for ways to be more active. Good food alone isn't enough to live a healthy life.
- Cooking and enjoying the pleasures of the table with family and friends contribute to good health.
- Every day, eat mostly whole grains, fruits, vegetables, beans, herbs, spices, nuts and peanuts, and healthy fats such as those found in olive oil. These are the core Med Diet foods you will shop for, prepare, and eat most often.
- At least twice a week, eat fish and seafood, the best sources of heart-and brain-healthy omega-3s.
- Yogurt, cheese, poultry, and eggs are also central to the Mediterranean Diet, in reasonable portion sizes.
- Red meat and sweets, at the top of the pyramid, are "sometimes" foods to eat less often.
- Wine and water are the typical beverages of the Med Diet. If you drink wine, enjoy moderate amounts: up to one glass per day for women, two for men. And, drink water throughout the day.

TO YOUR GOOD HEALTH!

There are many reasons to follow the Med Diet! Scientific evidence shows that it may help you:

- Achieve Weight Loss and Weight Management Goals
- Lower Your Risk of Heart Disease and Stroke
- Fight Certain Cancers and Chronic Diseases
- Maintain Brain Health During Aging
- Avoid Diabetes
- Resist Depression
- Nurture Healthier Babies
- Ward off Parkinson's Disease

EASY RECIPES TO FOLLOW THE MEDITERRANEAN DIET

Following the Med Diet's 8 simple steps for good health is easy, quick, and affordable with recipes such as:

- Greek Garden Pizza
- Pasta with Quick Marinara and Shrimp
- Spinach and Olive Pesto
- and dozens more

For detailed recipes and additional resources on the Mediterranean Diet, visit www.oldwayspt.org

rediscover goodness
OLDWAYS
266 Beacon Street, Suite 1 Boston, MA 02116 USA
617-421-5500

OLDWAYS
MEDITERRANEAN DIET
goodness rediscovered through the healthy and delicious cultural eating traditions of the Mediterranean

rediscover goodness
OLDWAYS
CULTURAL FOOD TRADITIONS

When you think of the Mediterranean, what comes to mind? Turquoise water? Sunny skies? Olive trees?

THE MEDITERRANEAN DIET

The Mediterranean Diet (or Med Diet) reflects a way of eating that is traditional in the countries that surround the Mediterranean, but you don't need to travel any further than to your local supermarket to discover its delicious flavors and fresh foods. It's easy to bring the remarkable health benefits and affordable Mediterranean style of eating to your kitchen cupboards, your refrigerator, your countertops, your stovetop, your oven, and your table every day. Embracing the Med Diet is all about making some simple but profound changes in the way you eat today, tomorrow, and for the rest of your life.

What to eat... how often... and how much. Oldways can help you get started with the Med Diet, in just a few easy steps.

FOLLOW 8 SIMPLE STEPS FOR GOOD HEALTH

1. Eat Lots of Vegetables.
There are so many choices! With fragrant mixed dishes typical of the Mediterranean, it is even easier to make half of your plate (or bowl) vegetables. Choose recipes like grain bowls, vegetable-based soups, and salads as a delicious strategy to incorporate more produce into your daily routine.

2. Change Your Outlook on Meat.
If you eat meat, have smaller amounts. For example, add small strips of sirloin to a vegetable sauté, or garnish a dish of pasta with diced prosciutto. As a main course, have smaller portions (3 ounces or less) of chicken or lean meat.

3. Enjoy Some Dairy Products.
Eat Greek or plain yogurt. Try smaller amounts of a variety of traditional, artisan cheeses.

4. Eat Seafood Twice a Week.
Fish such as tuna, herring, salmon, and sardines are rich in heart-healthy omega-3 fatty acids. Shellfish including mussels, oysters, and clams have similar benefits for brain and heart health.

5. Cook a Vegetarian Meal Weekly.
Build these meals around beans, whole grains, and vegetables, and heighten the flavor with fragrant herbs and spices. When one night feels comfortable, try two nights per week.

6. Use Healthy Fats.
Include sources of healthy fats in daily meals, especially extra-virgin olive oil, nuts, peanuts, sunflower seeds, olives, and avocados.

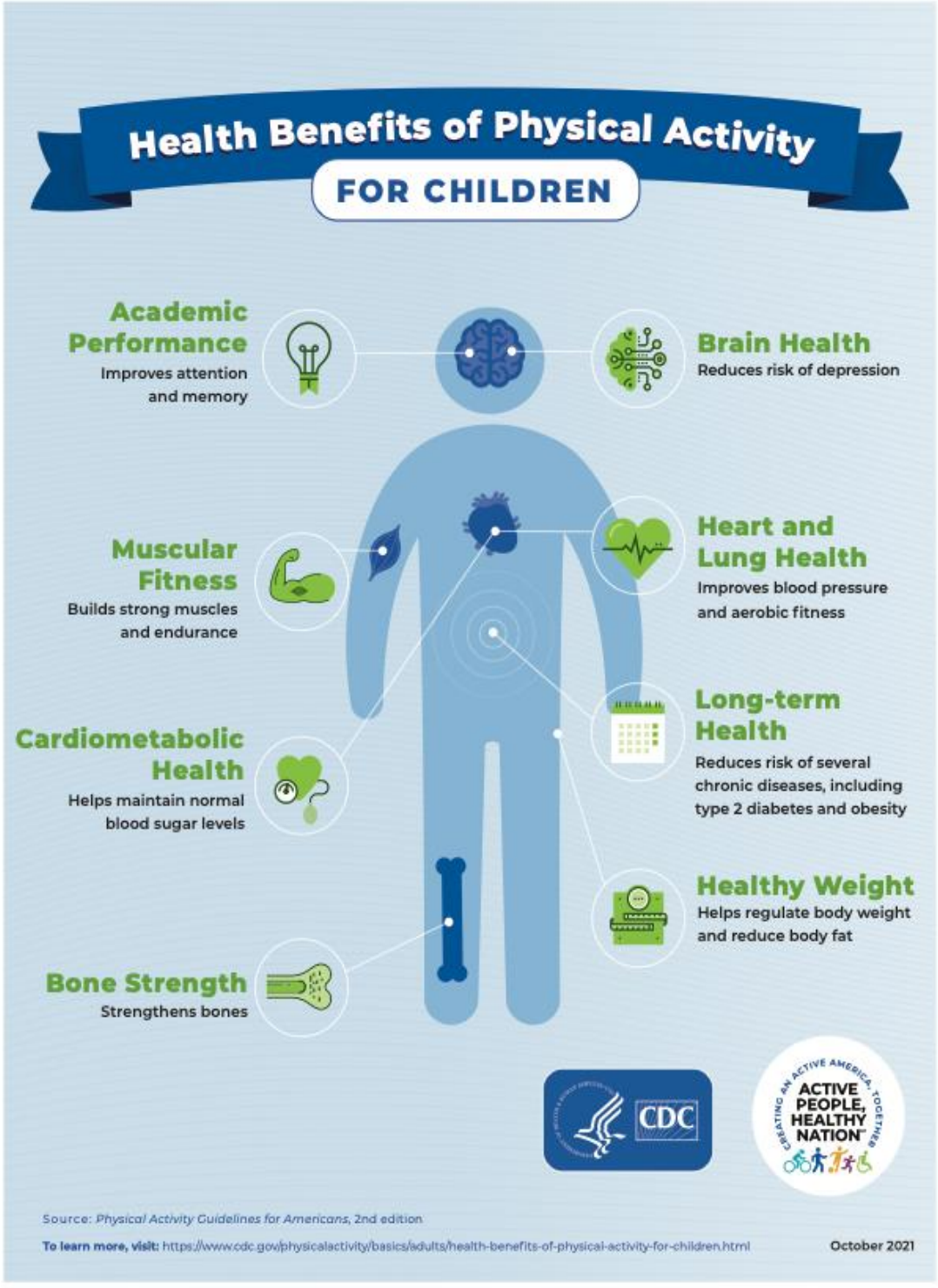
7. Switch to Whole Grains.
Whole grains are healthier, with more fiber, more protein, and higher levels of many essential nutrients. Cook traditional Mediterranean grains like bulgur, freekeh, barley, farro, and brown or black rice, and favor products made with whole grain flour. Even those on gluten-free diets can benefit from switching to whole grains like brown rice, quinoa, or sorghum. Gluten-free does not mean grain-free.

8. For Dessert, Eat Fruit.
Choose from a wide range of delicious fresh or dried fruits—from fresh figs and oranges to pomegranates, grapes, raisins, and apples.

For detailed recipes and additional resources on the Mediterranean Diet, visit www.oldwayspt.org

APPENDIX G

Exercise Education (packet)



APPENDIX H

Ethics Training

CITI PROGRAM

Completion Date 14-Apr-2022
Expiration Date N/A
Record ID 48440713

This is to certify that:

Kim Olmos

Has completed the following CITI Program course:

Not valid for renewal of certification through CME.

Group 1: Social Behavioral Educational Researchers
(Curriculum Group)
Group 1: Social Behavioral Educational Researchers
(Course Learner Group)
1 - Basic Course
(Stage)

Under requirements set by:

Valparaiso University

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?w23e0c891-17e2-45ec-b0e3-4631258b1483-48440713

APPENDIX I

Implementation Calendar

July-August 2023	Perform Literature Review and Dissemination of Evidence
September 2023	September 1, 2023: Project Launch September 6, 2023: Start of Data Collection
October 2023	Make every other week contact with patients/ caregivers to discuss patient specific medication, behavioral therapy reminders, diet, and exercise.
November 2023	Make every other week contact with patients/ caregivers to discuss patient specific medication, behavioral therapy reminders, diet, and exercise
December 2023	December 1, 2023, through December 15, 2023: Continue to make every other week contact with patients/ caregivers to discuss patient specific medication, behavioral therapy reminders, diet, and exercise December 16, 2023: Disseminate findings * time extended due to life happenings of participants and caregivers.