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Unplugging: An Evidence-Based Project to Reduce Screen Time and Improve Healthy Media Use in the Adolescent Population

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Final Manuscript

Unplugging: An Evidence-Based Project to Reduce Screen Time and Improve Healthy Media

Use in the Adolescent Population

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Abstract

Background: Excessive media use is an emerging health concern amongst the pediatric population. The American Academy of Pediatrics (AAP) recommends less than 2 hours per day of recreational screen time, yet the national average is between 7 to 9 hours per day for adolescents. A media-saturated lifestyle has consequences on a child's mental, physical, and emotional health. Despite guidelines stating media use should be assessed at annual well-visits, only 16% of providers are following this recommendation. This gap in care leaves many families with a limited understanding of the impact of media on their child's health and represents a missed opportunity to provide education on how to manage screen time at home.

Aims of Service Change: This project utilizes the Family Media Plan at the 13 to 18 year-old well-child visits to reduce daily recreational screen time, cultivate media awareness, and reduce lifetime risk of depression.

Details of Innovation: An educational presentation was held to review pertinent information and reinforce provider adherence to assess adolescent recreational screen time at all 13 to 18 year well-visits, educate on guidelines regarding healthy media habits, review risks and benefits associated with screen time, and assess readiness to change media related behavior. The Family Media Plan, an evidence-based toolkit created by the AAP to create sustainable media-related behavior changes, was offered to families at the well-visit in either a printed or online access card version. The provider reviewed the intent of this project with the family, added the pre-formatted template to the patient's chart, and received verbal consent for a follow-up phone call in 30 days to determine if the intervention was meaningful via a survey. Additionally, posters highlighting healthy behaviors were placed around the office to further support provider-led education.

Outcomes: The average baseline recreational screen time was 3.7 hours and the average post-intervention time was 3.0 hours for the 33 patients that responded at the 30 day follow-up. This demonstrates an 18% reduction in screen time correlated with implementing well-visit discussions on media use and utilizing the Family Media Plan. After conducting the follow-up survey, there was 93% family satisfaction with utilizing the Family Media Plan. Two providers agreed to participate in this project, and by October 30, 2019 both were assessing adolescent screen time and incorporating the Family Media Plan at all well-child visits as demonstrated through charting audits. Only 21 patients responded with post-intervention Patient Health Questionnaire-2 scores, which did not allow for a correlation between reduction in screen time and reduction in depression scores to be determined due to a small sample size. Notably, it was also found that there was an average of 1.3 less hours spent on media devices during the week than on weekends.

Implications to Practice: This reproducible and cost-effective intervention can help health care professionals, patients, and families respond to the growing problem of unhealthy media use. By assessing screen time, providers can connect families with resources, encourage open discussions, and gain a better understanding of their patients' health. Empowering youth to positively engage media can mitigate negative sequalae as patients grow into adulthood and reduce the burden of healthcare related costs.

Background and Significance

Televisions have become a staple in many American households and an estimated 75% of teenagers have their own smart phone (Council on Communications and Media, 2016). With media always just a finger-click away, there has been a notable rise in daily screen time (Felt & Robb, 2016). The American Academy of Pediatrics (AAP) recognizes media use as a health concern for the pediatric population, and in response, recommends that adolescents spend less than 2 hours per day on recreational screen time (Reid et al., 2016). Recreational time is defined as any screen time outside of school or learning purposes (Buchanan et al., 2016). Despite this less than 2 hour per day of recreational screen time guideline from the AAP, the national average for teenagers is estimated to be 7 to 9 hours per day (Rideout, VJR Consulting, Robb, & Common Sense Media, 2019). This media saturated lifestyle can have a detrimental impact on a child's overall physical, mental, and psychosocial health (Schurgin O'Keeffe, Clarke-Pearson, & Council on Communications and Media, 2011; Stiglic & Viner, 2019).

The literature to-date shows a dose-related-response with screen time (Stiglic & Viner, 2019). As the hours of media use increases, so do the rates of undesirable outcomes such as risk for obesity, cardiovascular disease, impaired sleep, depressive and anxiety symptoms, behavioral problems, incidence of cyberbullying, exposure to unsafe content, risk of a breach in privacy, lower academic performance, and reduced perceived quality of life (Reid et al., 2016; Stiglic & Viner, 2019). Yet, on the alternative side, when screen time is under 2 hours per day and media is utilized in a healthy manner, there can be a myriad of beneficial correlated outcomes such as a feeling of connectedness to others, the ability to find psychosocial support, access to common interest groups, and ways to cultivate creativity among users (Reid et al., 2016). Unfortunately, the trends indicate that most teens fall into the excessive-screen-use category (Rideout et al.,

2019). The negative impact from excess screen time to a teenager's self-esteem, mood, and increased exposure to unsafe content can also exponentially increase the risk for suicidality in this vulnerable population (Gunnell et al., 2016; Lin et al., 2016). Media-related behaviors developed in adolescence have been shown to persist, and often worsen, as the child grows into adulthood (Busschaert et al., 2015; Richards, Caldwell, & Go, 2015).

The negative sequalae associated with screen time may be mitigated by addressing media use now (Rideout, Foehr, & Roberts, 2010). Pediatric providers have a responsibility to their families and patients to educate on what healthy media use looks like (Council on Communications and Media, 2013). The AAP recommends that all providers discuss screen time at the annual well-child visit (Reid et al., 2016). Despite this guideline, only 16% of providers are following this recommendation of annually assessing media use (Council on Communications and Media, 2016).

In addition to a lack of care from providers, many parents report not knowing how to address, limit, or manage their child's media use (Rich, Bickham, & Shrier, 2015). This gap in care leaves many families with a limited understanding of the negative impact of excess media use on their teen's health and represents a missed opportunity for the health practitioner to provider education on how to manage screen time at home (Barry, Sidoti, Briggs, Reiter, & Lindsey, 2017).

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Evidence-Based Interventions

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A literature review was conducted to find interventions that reduced recreational screen time in the pediatric primary care setting. The following databases were searched: CINAHL, PubMed, Cochrane, PsycINFO, Sage Premier, Academic Search Premier, and Ovid. Keywords searched were media, screen time, social media AND adolescents, teenagers, children, youth, AND reducing, intervention, screening, family media plan. Clinical background keywords

searched were depression, anxiety, and mental health. Filters placed for articles were within the last 10 years, full-text, English language, age of 0-18 years. There were 216 articles reviewed, and 25 were kept based on the high-quality of evidence, relevance to the intervention, and population. The John Hopkins Nursing evidence-based practice (EBP) tool was used to grade articles for quality of evidence and resulted in five level I, five level II, seven level III, seven level IV, and one level V (Dearholt, Dang, & Sigma Theta Tau International, 2012).

The literature reviewed demonstrated that the AAP views increasing screen time within the pediatric population as a concern (Reid et al., 2016; Rideout et al., 2019). In response to the growing problem, the AAP created and recommends the use of the Family Media Plan (FMP) (Reid et al., 2016). The FMP is a media-awareness toolkit that offers evidence-based interventions to create healthy media habits (Council on Communications and Media, 2016; Reid et al., 2016). Families can review the FMP together online at www.healthychildren.org to determine which recommendations suit the specific needs of their household (Reid et al., 2016). Interventions in the FMP include general principles such as; increasing physical activity, discussing and monitoring screen time as a family, encouraging digital citizenship, creating screen-free zones in the home, watching shows together, and increasing face-to face family time (American Academy of Pediatrics, 2019). Teaching the next generation how to engage media in a creative and positive manner can be done by first addressing the media-related behaviors of the whole family unit (Babic et al., 2016).

Several studies, systematic reviews, and meta-analysis evaluated the effectiveness and quality of interventions to reduce screen time to less than 2 hours per day (Maniccia et al., 2011; Marsh, Foley, Wilks, & Maddison, 2014; Schmidt et al., 2012). Most studies were completed in a school or community center, but all outcomes with statistically meaningful results were

correlated with combining both parent and child involvement in the intervention (Maniccia et al., 2011; Marsh et al., 2014; Schmidt et al., 2012). Parent-reported screen time was shown to have good validity as a measurement for patient's media use (Wahi, Parkin, Beyene, Uleryk, & Birken, 2011). Additionally, setting screen goals for the family, discussing media openly, having the child track their own screen time and identify alternate activities, were successful interventions in reducing screen time (Hutson, Kelly, & Militello, 2018; Marsh et al., 2014). Caregiver involvement is a key principle to reducing screen time as the family acts as a social learning environment for the adolescent (Maniccia et al., 2011).

Low-income populations tend to have higher rates of screen time due to fewer resources and less opportunity for alternative activities (Ford, McDonald, Owens, & Robinson, 2002). The project site was a small pediatric primary care clinic that serves a diverse population of MediCal and WIC enrolled patients which may correlate to a higher incidence of overuse of devices based on this supporting evidence. A randomized control trial (RCT) was completed in a similar setting to the project site with three providers that aimed to reduce screen time. Both groups received 5 to 10 minutes of family counseling during well-child visits, and the intervention group added a TV time monitor (Ford et al., 2002). Families were evaluated at baseline and a four week follow up via phone survey. Both the intervention and control groups showed a measurable decrease in reported screen time furthering the notion that counseling during well-child-visits is a reasonable and effective intervention to reduce screen time (Ford et al., 2002).

Another large cluster RCT evaluated media use education at well-child-visits in 4,890 patients and families (Barkin et al., 2008). Baseline, 1 month and 6 month-follow-up data was retrieved via phone surveys. Provider-led counseling on media use took 3 to 4 minutes per 30 minute well-visit and focused on reducing screen time (Barkin et al., 2008). The post-

intervention data showed a statistically significant reduction in screen time associated with the provider education (Barkin et al., 2008).

Amongst these studies, the evidence supports provider-led discussions at well-visits as an effective intervention to reduce screen time in the pediatric population (Barkin et al., 2008; Ford et al., 2002). It also illuminates that providers gained a better understanding of their patient's overall health during discussions that center around media use (Barkin et al, 2008; Reid et al., 2016). Finally, these studies recognized that including families in the intervention is an important facet to reducing screen time (Maniccia et al., 2011; Reid et al., 2016). When health providers support the patient caregivers, cultivate open discussions about screen time, and equip families with the appropriate resources for how to make modifications at home, there can be sustainable behavior modifications related to media use.

<div align="center">**Project Purpose and Methods**</div>

This EBP project implemented provider-led discussions on

media use and utilized the FMP at the 13 to 18 year-old well-child visits to reduce daily recreational screen time, educate on the risks and benefits associated with media use, equip families with evidence-based interventions to make behavior changes, and reduce lifetime risk for depression. The FMP acted as the framework to guide provider-led education on the behavior modifications for healthy media use (Reid et al., 2016). Baseline data on screen time and depression scores were already being collected at the project site via the Staying Healthy Assessment and Patient Health Questionnaire-2 (PHQ-2) depression scores. Patients and families complete both forms via the I-pad as they are checked in for their appointment, and once completed, they are uploaded directly into the Electronic Medical Record (EMR) for provider

review. These documents are evaluated by the provider to determine patient's baseline screen time and PHQ-2 scores prior to entering the exam room and were entered the electronic chart.

During the well-visit, the provider discussed patient's screen time, educated on the AAP guideline of less than 2 hours per day of recreational screen time, and the risks associated with excessive screen time. Next, the health professional would elicit family beliefs and feelings regarding the patient's media use and determine willingness to change behavior. If the patient expressed a desire to improve healthy media use or have more resources regarding the matter, a paper or online access card version of the FMP was offered and reviewed by the provider. If the family received the FMP, the provider would additionally ask for consent to a 30 day follow-up phone call from the DNP student for feedback on use of the FMP. The time frame of 30 days was chosen based on King's Theory of Goal Attainment stating the average time it takes an individual to make behavior changes is 28 days (King, 1997). After this was completed, a pre-written template created by the DNP student was added to the EMR to streamline provider charting stating "Reviewed risks associated with excess screen time and how to incorporate healthy media behaviors. Gave Family Media Plan handout. Family consented to receive follow-up phone call in 30 days to review use of Family Media Plan." A simple click on the template inserted the script under the patient plan section in the well-visit template and allowed for easy identification of enrollment for the DNP student conducting weekly chart audits. To support the provider-education concerning screen time, educational posters were also placed around the office demonstrating the recommended education of 2 hours or less per day for recreational screen time. See Figure 4 for this poster.

The DNP student would finally add the patient to an anonymous Excel spreadsheet, void of any patient identifiers to notify of future-call date and use for later data analysis. After 30

days, a phone call was placed to administer a survey to determine post-intervention screen time, post-intervention PHQ-2 score, and general family feedback regarding provider-led discussions on screen time and family use of the FMP.

Stakeholder Identification and Sustainability Plan

This EBP project took place in a small, private community outpatient pediatric primary care clinic with two full-time providers. Due to the smaller size of the clinic, it made for an efficient collaboration process. An informal luncheon was held prior to initiation of the project to ensure all providers understood the rationale for assessing screen time, reviewed guidelines and patient education, and grasped the purpose of the EBP project. Monthly informal check-in discussions were held with the providers to review progress of the project, ensure providers compliance with the interventions, and give face-time to discuss any barriers they may be facing. The graduate student was at the project site clinic one to two times per week during office hours for follow-up phone calls and chart auditing. During these clinic visits, the student would also communicate project developments to staff. A synopsis of information gathered from the 30 day follow-up phone calls was shared during informal monthly face-time with the clinicians. These different check-ins aided the student in identifying barriers that clinicians were facing so that adjustments can be made to ensure the project's success.

The DNP student also individually assessed for barriers prior to the initiation of this project to identify areas that may be adapted to achieve successful implementation. One barrier identified was a lack of provider time during well-visits. With a total of 20 to 30 minutes to address parental concerns, complete the physical examination, provide anticipatory guidance, and create a tailored plan for the patient, it can be a challenge to add discussing media use. Some providers also may not have been aware of the negative implications of media use on

adolescent's health and thus have not prioritized it as a discussion point. To mitigate this barrier, the DNP student reviewed the evidence regarding the importance of discussing media use at well-visits and the correlated negative outcomes associated with excessive screen time to ensure provider understanding and buy-in with this project.

Perhaps the greatest threat to the project was patient or family resistance to change. Assessing readiness to modify media-related behavior, educating on risks of excessive screen time, and offering the FMP to families are all strategies to avoid creating stress on the provider-patient relationship and encourage future discussions when families feel ready for change. Not everyone will feel ready to make these adaptations to their daily routine at the initial discussion, but by creating an open, non-judgmental dialogue at well-visits it can create the framework for alerting families to the importance of this facet of their child's health and hopefully plant a seed for future changes. For successful outcomes, it was imperative that the DNP student recognize and collaborate with stakeholders throughout the duration of this project.

In maintaining communication with the project site, a dissemination of results took place at a luncheon stakeholder presentation on April 09, 2020 to offer gratitude for continued support, share the project outcomes, and disseminate clinical implications for continued use of the FMP. This luncheon also acted as a time to evaluate the strengths and weaknesses of the project so that the DNP student can integrate those changes for future clinical practice. This final presentation and discussion revealed that the clinic has fostered sustainable practice change in response to this EBP project. The project site mentor assisted the DNP student in acting as a champion for the project by ensuring other providers were implementing the FMP at well-visits.

Open communication was maintained with interested parties to ensure continued involvement, completion, and sustainability of the project. To assist in receiving and providing

updates regarding the graduate student's project, bi-monthly meetings were held with the faculty advisor, and email correspondence was utilized at other times for further project guidance. Process stakeholders for this project were identified as being the DNP student's faculty advisor from the University of San Diego (USD) and the clinical site mentor at the project site. Additionally, all pediatric clinicians were process stakeholders as they were responsible for handing out a copy of the FMP and educating on risks associated with screen time during the adolescent well-visit. The outcome stakeholders for this project included the clinic's medical assistants, the practice owner and lead physician, clinical site mentor, and the DNP student's faculty advisor.

Even though the project has concluded, the processes implemented have been integrated into all well-visits by the project site. Sharing feedback from families related to the intervention, with the providers at the project site was an important piece to encourage continued prioritization of media use discussions during well-child visits as there was very positive feedback from families related to these discussions and using the FMP. The DNP student previously educated clinicians on the rationale for why assessing screen time is important, but family's responses to the intervention held great relevance and importance to reinforcing the education. Additionally, the FMP handout materials are free and easily accessible on the AAP's Healthy Children website (i.e. www.healthychildren.org) thus ensuring no difficulty for providers continued use and recommendation. The low associated costs with printing copies of the FMP also assists in reducing the aversion to incorporate this patient handout for all adolescents. The office manager now has access to the handout-card template that the DNP student created if the patients wish to utilize the electronic version of the FMP, so that those can also be printed. Finally, the pre-formatted template added to the patient's plan in the EHR charting system continues to ensure

ease-of-access for providers to incorporate the anticipatory guidance and documentation that the FMP handout was given during the well-child visit as an indicator that this concern was addressed by the provider. A simple click of the mouse includes all the education and relieves the provider from having to type in additional information.

EBP Model

The John Hopkins model is a user-friendly, efficient project implementation model (Newhouse et al., 2014). It offers a streamlined method to answer a practice question and build and translate evidence into real-world use (Dearholt, Dang, & Sigma Theta Tau, 2012). This model was utilized for this EBP project and aided in the roll-out of this project through a structured step-by-step approach (Newhouse et al., 2014).

The John Hopkins model considers internal and external factors related to implementing EBP such as; understanding the culture, environment, resources, and organization (Dearholt et al., 2012). This model reflects the importance of patient preference (Dearholt et al., 2012). If families do not view screen time as a problem, there was limited success in offering and applying the FMP. Utilizing this model helped the DNP student recognize patient preference as a barrier so adaptions could be made. Understanding these variables with the help of the John Hopkins Model, helped better prepare this project to withstand adversity.

Project Timeline

An educational stakeholder presentation took place April 18, 2019 at the project site to review the purpose of this DNP project with the following individuals; the lead medical doctor and owner of the practice, the project site mentor, and the clinic's nurse manager who also acts as the insurance and chart auditor. The information was disseminated and agreed upon by

members in attendance and finalized by a signed letter of approval by the owner and lead clinician of the office.

After obtaining this letter of approval, an application was submitted for IRB approval at USD on April 30, 2019. The USD IRB approved the project for initiation on May 7, 2020 and the project commenced on May 14, 2020. Weekly chart audits were completed over the next few months, and follow-up phone calls concluded October 30, 2019. After the conclusion of the phone calls, data synthesis began in November and was completed in December of 2019. The project site mentor had vested interest in the success of this project. The project faculty chair also helped guide the DNP project process. An illustration of the project timeline can be found in Table 1 for further details.

Process Indicators

For this project, the pre-intervention data collected from weekly chart audits included patients'; age, gender, ethnicity, insurance, zip code of home address, baseline average screen time in hours per day, and baseline PHQ-2 scores. All this information was available in the demographic portion of the EMR charts and via the intake forms filled out by families and patients on iPads as they check-in. No new processes were added to the check-in or intake form process, but information from these processes was captured in this project. This data had importance to the data analysis to determine if there were patterns amongst increased screen time and demographic features. Gathering this information did not add additional workload to the clinic or associated costs for the DNP student to gather.

At the initial stakeholder meeting on April 18, 2019 the graduate student educated clinicians on the risks associated with increased screen time and reviewed evidence-based interventions to mitigate unhealthy media behaviors. The DNP utilized teach-back methods and

discussions to demonstrate provider understanding of the information (Melnyk & Fineout-Overholt, 2015). Next, the clinicians agreed to the processes of the project to assess screen time, review risks and benefits associated with media use, and offer tailored anticipatory guidance on home-based interventions to encourage healthy media use during the well-child visit of all 13 to 18 year-olds. After completing well-visit education, the provider reviewed and gave the FMP paper handout or online access card to be completed at home. Finally, the provider asked for verbal consent from the families to receive a 30 day follow-up phone call from the DNP student regarding their experience using the FMP. If the families agreed, the provider would enter the above mentioned pre-scripted template into the patient chart under plan to alert the DNP student during chart audits that this patient had agreed to review the FMP and receive a phone-call for follow-up.

On average, the clinician spent 3 to 5 minutes discussing screen time with the family, which is an increase time of 2 minutes spent additionally from previous care. Weekly chart audits were conducted by the DNP student to determine provider adherence with the project for all well-child 13 to 18 year old visits and a process indicator goal was to have 75% of providers participating by July 2019. After May 1, 2019, the clinic lost a provider, so the project was completed by two providers for the duration of the project, changing the goal to reflect 50% provider participation by July 2019. This goal was met and by October 2019, 100% of providers were participating in the project.

Post-intervention process indicators collected during the 30-day follow-up phone call included; average screen time in hours per day reported by both the caregiver and the patient, a post-intervention PHQ-2, qualitative feedback via a questionnaire regarding the use of the FMP, and overall satisfaction scores with the FMP and clinician-led education during the well-child

visit. A total of three phone calls were placed to the family to elicit this information and if no response, the patient was added to a category of "not responsive." In total there were 11 patients that were in the non-responsive category as due to failure to answer phone-calls. Previous studies utilizing follow-up phone calls to determine the efficacy of an intervention determined that an average of 28 days is needed for behavior modification, and this timeframe was additionally supported by King's Theory of Goal Attainment (Ford et al., 2002; King, 1997). As information was gathered via the follow-up questionnaire, patient identifiers were removed, and remaining data was placed into an Excel spreadsheet to track responses for data analysis. No new patients were added to the 30 day follow-up call list after September 30, 2019 as the project was time limited, but clinicians did continue to offer the media education and the FMP handouts to sustain this project's integration into the clinic.

The initial goal was to achieve a 25% reduction in screen time with this intervention. After the data was synthesized, there was an 18% reduction from baseline reported daily average screen time at the well-visit as compared to the post-intervention screen time collected during the 30 day follow-up phone call. A goal of a 75% family questionnaire completion rate to yield meaningful results was placed at onset of project, and there was a 75% response rate with 33 out of the 44 patients responding to the 30 day follow-up phone call.

Qualitative data regarding overall family satisfaction and feedback with the intervention was another important aspect of this project and determined via the questionnaire. Families were asked if the health care provider helped them understand the risks associated with increased screen time at the well-visit and if they used the FMP. If they answered no, they were asked if they could respond why this was the case. If the answered yes to utilizing the FMP, the questionnaire asked additional questions regarding the FMP's usefulness in generating new ideas

to improve healthy media use and if they would continue to implement it at home. The survey consisted of 4-point Likert scale style questions. The targeted outcome was to have an overall 80% reported family satisfaction with the FMP, and after disseminating the results, there was a 93% overall family satisfaction amongst those that utilized the FMP.

Finally, the PHQ-2 was also re-administered during the follow-up phone call to determine if there was a reduction in depression scores associated with the intervention to reduce screen time. Although depression is a multi-faceted problem affecting adolescents, the literature does show a dose-dependent response to an increase in depressive symptoms with excessive media use (Lin et al., 2016). This data did not yield meaningful results pertaining to PHQ-2 scores as the DNP student only received post-intervention PHQ-2 scores on 21 patients at follow-up. This small sample size did not show any positive correlation when trying to isolate the variables between reducing screen time and improving depression scores.

Dissemination of Outcomes

The DNP student's EBP project was accepted to share via a poster presentation format at the National Association of Pediatric Nurse Practitioners (NAPNAP) Conference set to take place on March 25-28th 2020 in Long Beach, California. The conference and poster presentation were cancelled due to restrictions placed on group gatherings due to COVID-19 outbreak. Additionally, the project abstract was accepted for a poster presentation at the California Association of Nurse Practitioners Conference that was set to take place in Riverside, California on March 19-22. 2020. Both conferences have a focus on clinical information that was pertinent to the information gathered in this project, support accepting student EBP and are nurse practitioner based organizations.

The DNP student hopes to submit this manuscript for publication to the *Journal of the American Medical Association Pediatrics*. This journal distributes peer-reviewed, professional, and pediatric-specific articles to primary care pediatric providers all around the world. This journal has a variety of specifications regarding EBP project submissions but will accept a manuscript once adjusted to the required format.

Cost Benefit Analysis

This project aimed to create cost-avoidance for the American health care system by mitigating risks such as depression as the adolescent patient grows into adulthood. For instance, reducing the risk of a child needing one inpatient hospital admission related to depressive symptoms would save an average of $7,000 per one visit lasting 8.4 days (Stensland, Watson, & Grazier, 2012). Major Depression Disorder is one of the most common mental health disorders impacting Americans, and there has been a continued rise amongst the adolescent population in recent years (Lin et al., 2016). As of 2015, the American Psychiatric Association & Center for Workplace Mental Health determined that the average annual spending for costs associated with Major Depression Disorder was 210.5 billion dollars in the United States, and with a continued increase in reported depression cases, there will be a correlated increase in costs. While depression is a multi-faceted disease process that can have many triggers and influences impacting its presentation, it is important that providers recognize media use as a potential contributing factor (Kelly, Zilanawala, Booker, & Sacker, 2018). It is important that providers offer anticipatory guidance and risk reduction education regarding media use to reduce the burden of costs associated with depression (Lin et al., 2016; Reid et al., 2016).

As previously discussed, no additional screening tools were needed for this project and providers are already discussing screen time during well-visits based on patient reported screen

time from the Staying Healthy intake form. The cost of time was the largest variable measured for this project's overall abstract cost. An additional 3 to 5 minutes of clinician time was needed to provide risk reducing education, illicit parental concerns related to patient media use, and review the FMP handout with the family. There is a perceived financial cost from those 3 additional minutes of provider time to go towards discussions, but it is difficult to determine since the provider already is scheduling the patient for a 25 minute appointment that this education falls within. Follow-up phone calls to gather feedback on use of the FMP 30 days post-well visit to determine successful outcomes were conducted by the DNP student and each phone call took an average of 15 minutes.

The financial costs associated with this project are from the printed copies of the FMP and electronic address cards. The DNP student provided copies of the FMP to be given to families during the well-visit and each packet required 5 pages of printing. The student also printed cards with the website address listed and directions of how to access the FMP online if the family wished to complete it electronically. An estimate of the potential costs and savings associated with this project are provided in Table 2.

While the financial benefits associated with this project may be less tangible and focus on cost-avoidance, there are many non-financial benefits for the patients, providers, and practice. By incorporating 3 additional minutes to discuss pertinent patient or caregiver concerns, there will be improved patient satisfaction, communication, and better provider understanding of patients' overall health. This communication can help build trust between the family and provider (Reid et al., 2016). By creating a non-judgmental environment for dialogue with patients, trust can be built and act as the foundation for a beneficial provider-patient relationship.

Recreational screen time greater than 2 hours per day has detrimental effects on adolescent physical and mental health (Stiglic & Viner, 2019). Looking at Major Depression Disorder alone, there is an estimated $210.5 billion financial burden upon U.S. healthcare (American Psychiatric Association, 2015). By reducing the associated health risks that are correlated with detrimental screen time use, there could be a reduction in health care costs as adolescents grow into adulthood (Lin et al., 2016).

Data Analysis and Results

After the completion of this project, data was aggregated to create meaningful and measurable results. As previously discussed, the patients' daily reported screen time was evaluated to determine if there was a reduction in response to implementing the FMP and well-visit media use discussion. With the assistance of Dr. Donna Agan, the DNP student ran a paired T-test comparing the mean, standard deviation, and standard error of the mean of the 33 patients' pre and post-intervention screen times. The results of this test demonstrated that at the 30 day follow-up there was an 18% reduction in average daily recreational screen time. The pre-intervention screen time average was 3.742 hours per day, and the post-intervention screen time was 3.045 hours per day. Using the total mean of both groups was a relevant way to determine if the well-visit discussions and the utilization of the FMP created a quantifiable impact. It is difficult to ascertain whether this 18% reduction in daily recreational screen time was a direct correlation with the implementation of the FMP, the well-visit discussion, or a combination of both since they were completed simultaneously. It may be of interest to future projects to try to isolate the variables and determine the effectiveness of one intervention over the other, or if the intervention is most successful with them used in combination as was done in this project.

The mean screen time of adolescents, both pre-and post-intervention, were then grouped into age-based categories to determine if there was a consequential difference in screen time per age group. Figure 3's bar graph chart visually demonstrates this information and points to the largest reduction in screen time amongst the 16-year-old population with this intervention. Utilizing the average screen time per age group, both before and after the intervention, was a helpful result to provide clinicians with understanding of the ages most affected by excess screen time and those most impacted by this intervention.

Another paired t-test was initiated to determine if there was a difference in adolescent media use between the weekdays and weekends. Patients and caregivers were asked about their average estimate of weekday recreational screen time versus their average weekend screen time during the follow-up survey. Notably, the responses revealed that of the 33 teenagers, they spent an average of 1.3 hours more on devices on weekends as compared to weekdays. This information helps guide provider understanding for future interventions on discussing total average screen time with families, and recognition that with more flexible free-time on the weekends, patients have increased their screen time.

Demographic information was also collected during weekly chart audits. This data was statistically compared using frequency and percent rates to determine if patterns existed amongst media use and gender, age, ethnicity, insurance carrier, or zip code. The figures from the frequency and percentages of the demographics revealed no distinct variable as being associated with increased or decreased screen time. The project had equitable division between gender, insurance carriers, and zip code distribution but had higher frequency of patients aged 13 and 15 as demonstrated by the graph in Figure 2. The frequency results also showed that most patients that participated, 42%, identified as Caucasian. The demographic breakdown of the clinic and the

patients seen at the annual well-visits between May and September 2019 did not demonstrate any correlation with increased screen time based on this sample.

Another outcome in this project, was looking at family response-rates at the 30 day follow-up phone call. This information was evaluated using a percentage. Out of the total 44 patients, there were 33 patients that responded and 11 that did not after 3 phone call attempts, making it a 75% response rate. A 75% response rate was the projected outcome goal for this measurement.

In addition to the percentage of responses, the follow-up questionnaire was intrinsic to the qualitative data gathered for this project regarding family satisfaction scores and use of the FMP. Out of the 33 patients that answered the follow-up phone call, 19 stated they had used the FMP while the other 14 individuals did not use the FMP. A pie chart, Figure 1, was created demonstrating the percentage breakdown of answers. To determine most commonly cited reasons for why the FMP was not used, the DNP utilized the highlight feature in Excel for searchable terms to extract themes. Of the 14 families that did not use the FMP, the most common listed reason for why was that they had "forgot to use" it. Most families stated after leaving their child's well-visit, they had returned to their busy lives and did not remember to utilize the FMP. The 19 patients and families that did review and implement the FMP were asked a further question regarding if they felt satisfied with this resource, and an overall 93% of families reported satisfaction with the FMP as a resource via the survey.

The percentage rates analyzed from the survey data helped the DNP student gain a better understanding of the challenges of capturing data through utilizing follow-up phone calls, but despite this, it did meet the projected outcome goal of a 75% response rate so can be considered a successful modality for reaching families after this intervention. The responses of those that

did not use the FMP helped also guide future provider expectations, that while the FMP is a helpful resource for providers and an anecdotally favorable resource amongst families that utilized it, there are many families that will forget to implement due the demands of daily life. These findings can be the basis for future projects to try to find new ways to encourage adherence to home behavior modification. Finally, the 93% reported satisfaction with the FMP was a very meaningful result to the project stakeholders and DNP student as it reaffirmed the FMP as a favorable evidence-based resource that providers can offer to families.

The responses from families via the 30 day follow-up survey were once again evaluated to identify qualitative themes using the highlight feature for frequently used words amongst comments from the survey on questions pertaining to provider-led discussions on media use at the well-visit. The first question asked, "did the healthcare provider help you understand the risks associated with increased screen time at the last well child appointment." All family responses were either "strongly agree" or "somewhat agree." The second question was whether the family enjoyed the provider-led discussions concerning media use at the well-visit. Again, the primary response from families was either "strongly agree" or "somewhat agree," with only one family reporting "somewhat disagree." This questionnaire information was helpful for providers to recognize the impact of well-visit education on family understanding of risks of excessive screen time and recognize that these families are open to having media use discussions with their pediatric provider.

Other survey feedback themes amongst those that utilized the FMP was evaluated to determine common trends for understanding the FMP as a resource. Questions were framed to evaluate if the families found the FMP helpful, if family communication about media use improved after using the FMP, and if this resource made them feel better prepared to manage

screen time at home. The overwhelming consensus was "strongly agree" or "somewhat agree" to all questions about the FMP. When asked what the most utilized interventions from the FMP were, the most common responses were: "No-phone-zones", watching television shows together as a family, turning off devices 1 hour before bedtime, and plugging in their child's phones overnight to charge outside the bedroom. The most frequently used "no-phone-zones" were eliminating phones during mealtimes and out of the patient's bedroom overnight. Several families also offered additional feedback stating it helped them realize the importance of reviewing their child's social media accounts and safety settings, that this tool helped give them more face-time with their children, and the child had more time for alternate activities after reducing screen time. Of the 19 that responded to using the FMP, 18 stated "strongly agree" that the FMP is something their family will continue to use. These themes illuminated by the survey can encourage providers that this intervention can be sustained at home long-after the well-visit and had favorable behavior modifications to improve healthy media use.

The short term outcome goal for this project was to have 50% of providers discussing screen time at adolescent well visits and offering the FMP to all patients by July 2019, and this goal was met with one of two providers actively participating in the project at that time. A long term outcome was for 100% provider adherence to education on media use and offering the FMP to patients by October 2019, and this goal was also met as both providers were adhering to this project at that time. At the project stakeholder meeting held on April 09, 2020, both providers that participated in this project have continued to sustain assessing screen time at all annual well-visits, and when identifying a family that needs additional guidance, are offering the FMP.

Finally, the data was analyzed to determine if there was correlation between reducing screen time and improving PHQ-2 scores. As previously discussed, baseline PHQ-2 scores were

already being compiled at the well-visits for the 13 and older population at this clinic. During the 30 day follow-up phone call, the DNP student attempted to re-administer the PHQ-2 but was only able to speak with 21 patients out of the total of 33 caregiver responses. From this ordinal data, a spearman rho test with a paired t-test was completed to isolate the variables of screen time and PHQ-2 scores, but due to the smaller sample size the statistical analysis showed no correlation between decreased screen time and decreased PHQ-2 score. It should also be discussed that depression is a multi-faceted disorder, so as an outcome measurement, can be very challenging to isolate screen time as a contributing variable to the larger mental health concern overall. Additionally, 17 out of the 21 patients reported PHQ-2 scores of 0 at both the pre and post-intervention, leaving only 4 patients to try to glean information pertaining to correlation in the intervention and depression scores. Overall, this result did not contain any statistical meaning or correlation but can be considered for future projects as a potential variable that plays as a facet into adolescent mental health.

Implications to Clinical Practice

Excess media use is on the rise despite the AAP's recommendation that adolescents have less than 2 hours per day of recreational screen time (Reid et al., 2016). The literature shows there are negative impacts to a child's physical, mental, and psychosocial health correlated with a constantly connected lifestyle (Stiglic & Viner, 2019). It is imperative that providers recognize screen time as an important facet of adolescent health and begin to assess and address media use at annual well-visits per AAP guidelines (Reid et al., 2016).

As demonstrated by this project and the evidence gathered, provider-led discussions regarding the risks associated with unhealthy media use and integrating the FMP, can create sustainable behavior modifications (Council on Communications and Media, 2016). By

integrating these discussions into the well-visit, it can also help providers gain a better understanding of their patient's health status (Reid et al., 2016). As screen time increases, it displaces time for things such as physical activity, time with family and friends, and pursuing other activities and hobbies (Stiglic & Viner, 2019). As the provider addresses screen time at the well-visit, it also notifies caregivers that this is an important area of concern worth analyzing (Rideout et al., 2019).

After concluding this project, barriers were illuminated that should be considered for future integration of provider discussions and utilization of the FMP into clinical practice. This project successfully incorporated provider-led education at well-visits and utilization of the FMP by October 2019; however, adding additional discussion points to the providers work-load to try to squeeze into a 30 minute appointment was as a challenge and might cause some providers to resist clinical practice change. On average the media-related assessment and discussions took between 2 to 5 minutes during the well-visits, so while it is an addition, at the longest it did not exceed more than 17% of the appointment time but did yield great input into the patient's overall health. The success of sustaining this practice change was accomplished by ensuring provider-buy-in with the educational luncheon about the importance of assessing for media use held prior to initiation of the project, offering monthly check-ins, and reviewing the successful results of reducing screen time with this intervention. The two providers voiced their approval of this project at the stakeholder meeting and feel that assessing screen time is a worthwhile investment into their patients' health.

Discussions with the patient and the families about screen time was helpful for providers to determine if there was a problem that needed to be addressed. However, even in the realm of excessive media use some families did not find issue with their child's media habits. Due to the

lack of concern, these families were not ready to make behavior modifications and thus refused the FMP. Assessing readiness to change is a primary principal when looking to change a habit, so until families are ready it is important for providers to offer discussions in a non-judgmental format that can hopefully plant the seed for future openness regarding changes (Melnyk & Fineout-Overholt, 2015).

The follow-up modality of utilizing phone calls worked well for most patients; yet, there was still a 25% of families lost to follow-up due to this. Additionally, the DNP student was only able to speak with 21 out of the 33 adolescent patients rather than just the caregivers which made it challenging to determine the impact of the intervention on the patients themselves. This barrier for following up with patients via phone call can be considered for future projects as something to modify in hopes to yield a better return on patient experiences with the FMP and screen time reduction strategies.

Finally, the barrier of families forgetting to use the FMP after the well-visit was an anticipated challenge. Many families enjoyed the well-visit discussion on media use, but after returning to the business of their daily lives, forgot to use the FMP. Understandably, there are many things pulling at the attention of families, so it is important for providers to continue to cultivate discussions at the annual well-visit as a reminder of the importance of addressing screen time. Many families are open to the idea of change but integrating those behavior modifications can take time and repetition of hearing the provider address it.

Conclusions

Through this educational intervention, families gained an understanding of the risks associated with disproportionate screen time and made adaptations to their lifestyle accordingly through utilizing the FMP. The FMP is a useful, easily accessible resource that encourages open

communication within the family about health issues and acts as the framework for families to address media use together. By including the family in this intervention, realistic and tailored expectations for media use can be established and these changes can be supported by caregiver role modeling. Through the provision of this patient and family education tool, adolescents can lead healthier lives and learn better strategies for working with the current screen addicted culture.

       This reproducible and cost-effective intervention can help providers, patients, and families respond to the growing problem of media use and improve the health of this population as they grow into adulthood. The FMP equips families with evidence-based suggestions that address ways to integrate changes practically and realistically into their homes. Training families and patients how to address media use now can mitigate the development of negative habits and behaviors that are associated with unhealthy media use and hopefully reduce the burden of associated health care costs. Pediatric providers have a responsibility to follow the latest evidence and educate families on how to engage a technology laden world in a healthy manner.

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List of Tables

Table 1

Family Media Plan EBP Timeline

Task	Intended Date of Completion
Project Proposal Meeting	April 18, 2019
Letter of Approval	April 18, 2019
Creation of EMR Charting Plan Template	April 25, 2019
USD IRB Approval	April 26, 2019
Chart Audits for Well Adolescent Visits	May 1, 2019
Project Roll-out	May 1, 2019
Weekly Chart Audits	May 2019-September 30, 2019
Address barriers/process changes	June 2019
Follow-up phone calls	June 2019-October 31, 2019
Data Synthesis	November 2019-December 2019

Note: This table represents the timeline for which this project was carried out.

Table 2

Cost Benefit Analysis

| Cost-Benefit Analysis		
Resource	**Cost**	**Rationale**
Copies of Family Media Plan (15 patients)	$0.20/page 5 pages = 1 packet= $1.00/packet 15 packets=$15.00	Have providers review the physical copy of the Family Media Plan and explain the interventions recommended by it. Give to families to fill out at home.
Copies of Electronic Access Directions	$0.50/page 8 cards/page 2 pages printed=$1.00	Give families a card educating on how to access electronic version of Family Media Plan as alternative option.
Provider Training	$0 Time: 30 minutes	No cost, completed during a one-time 30-minute stakeholder/staff meeting during office hours
Follow-Up Phone calls	$0 Time: 15 minutes/call x 15 calls= 3hr 45 min	During regularly scheduled business hours, no additional provider time required as it is conducted by DNP student
*** Provider Time during Well Child Visit	Average San Diego Pediatric Provider cost/ 3 minutes of well visit: $ 3.35 X 15 patients= $50.25	Average San Diego Pediatrician: $179,835/year Average San Diego NP: $135,393/year Average 18 patients seen per day at this clinic 261working days Each patient encounter: $28.82-$38.27=$0.96-$1.27/minute
Total	**$16.00** *** with provider time cost: **$66.25**	
Benefit	**Reimbursement**	**Rationale**
Cost of 1 Adolescent Depression-Associated Inpatient Admission	$6,990 for 8.4 days (Stensland, Watson, & Grazier, 2012))	Cost prevention of mitigating inpatient stay related to depression by utilizing the Family Media Plan and provider-led education to prevent associated depression
***Cost of Major Depression Disorder annually	$2,105,000,000/year	Annual direct and indirect costs to U.S. Health Care due to Major Depression Disorder could be reduced by providing preventative education and interventions to reduce the risk of depression.
Intangible benefits	*Improved family satisfaction and communication* *Improved patient-provider relationship* *Improved understanding of overall patient health* *Decreased risk of adolescent depression and unhealthy media use*	
Cost Benefit Analysis Return on Investment	**For every dollar spent on this project, MediCal is saving $105.59 from preventing an inpatient admission** **ROI: ($6,990-$66.25= $6923.75) / $66.25= $104.51 x100%= 10,451 % return on investment for Medical**	

Figure 1

Reported Use of Family Media Plan
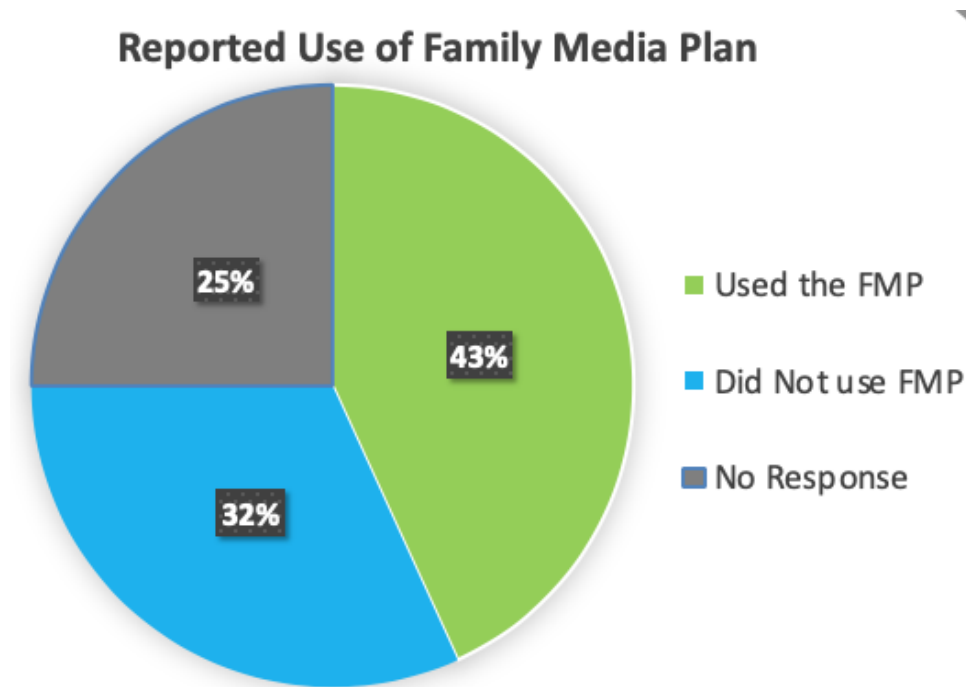
Note: Out of the 44 patients that said yes to participating in the project, 33 responded at the follow-up phone call and 11 did not respond (25%). Of the 33 that responded, 19 families stated using the Family Media Plan (43%) and 14 families did not use the Family Media Plan (32%). This pie graph represents the data in percentages.
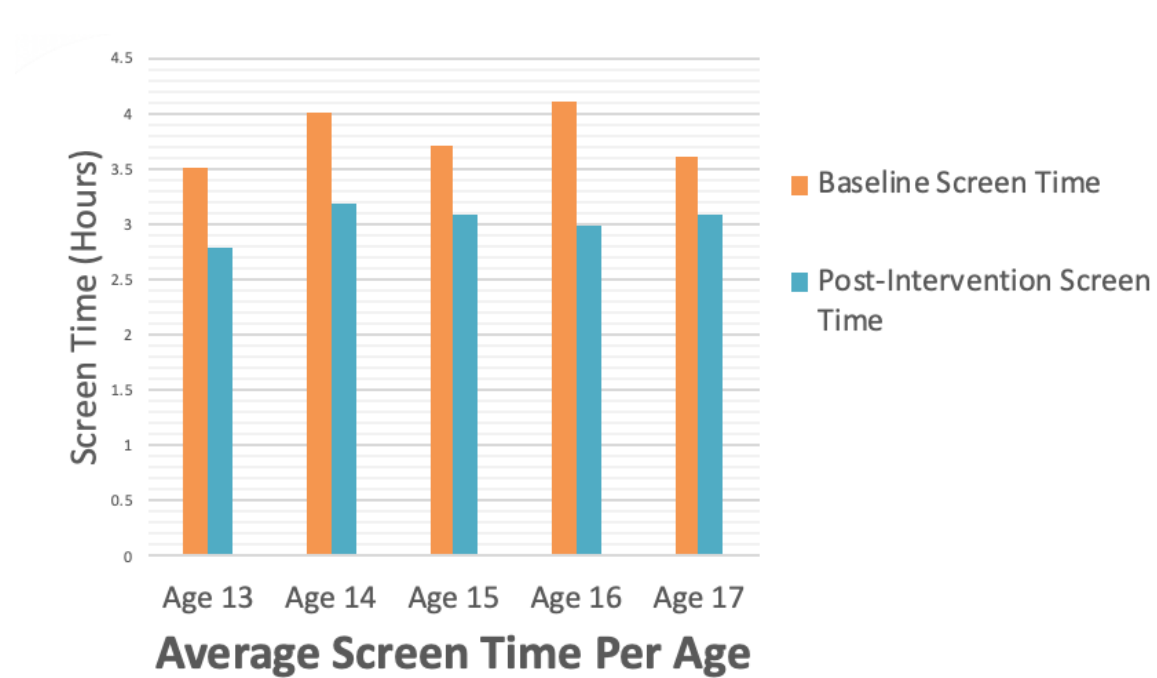
Figure 2

Age Frequency
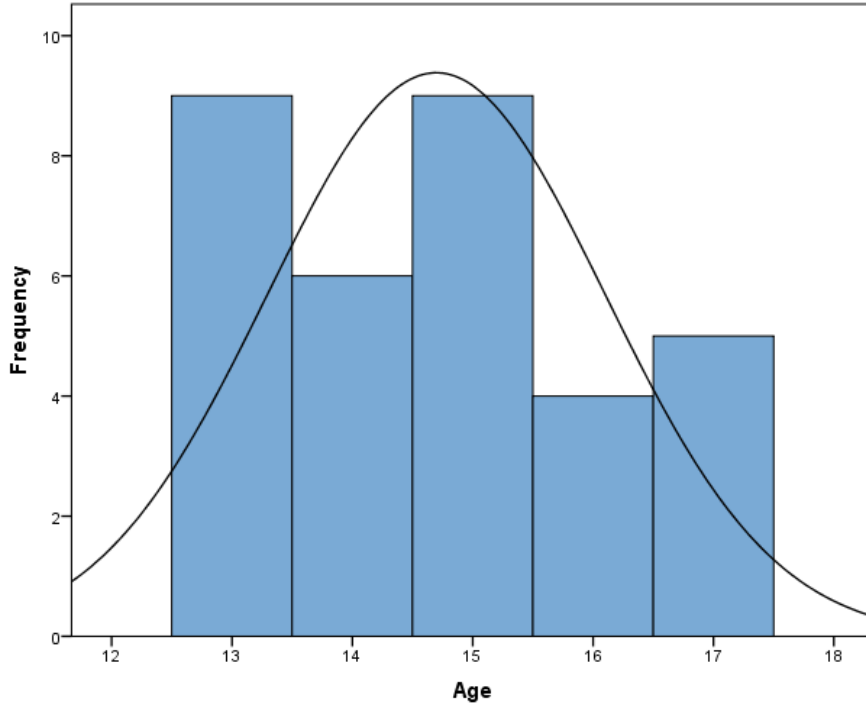
Note: The bar graph represents frequency of ages seen at annual-well visits that agreed to participate in the evidence-based project. The most frequently seen ages by the providers were 13 and 15.

Figure 3

Baseline and Post-Intervention Screen Time by Age

Note: Daily recreational screen time average was assessed at the annual well-visit and then again after 30 days via a follow-up phone call. The bar graph represents the average screen time grouped by age and demonstrates pre and post-intervention results.

Figure 4

Healthy Behaviors Educational Poster

Note: This educational poster was placed around the project site office by the DNP student at the end of May 2019 and remains posted as of April 2020 to support provider-led education strategies.