

Optimizing Patient Education on Orthotic Bracing

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Notes from the Author

This project is dedicated to my brilliant daughters: Both of you have sacrificed so much to allow me to follow my dream. Know that you are capable of anything you set your mind to, and never give up on your passion. You are intelligent, creative, and important. There is no dream too big, no goal too outrageous. I hope you follow your dreams relentlessly and achieve more than you ever thought possible.

Special appreciation is due to the people who supported me throughout this journey. My husband: thank you for your endless support. Thank you for putting up with the marathon study sessions, the mental break-downs, and my stubborn perfectionism. My parents: you believed in me from day one. You have sacrificed so much of yourselves to make my dream a reality. I would never be where I am in life without your selflessness and I am so grateful for you both. My ECU project faculty coaches, Doctors Tomika Williams, and Jan Tillman: Thank you for your guidance and consultation. Even through my untimely panic parties and scatter-brainedness, you calmed and encouraged me. I have never questioned your desire to see me succeed. Having you on my team has been a blessing.

Abstract

The partnering organization was a durable medical equipment company specializing in orthotic back bracing. The Coronavirus pandemic of 2020 forced the company to halt in-person delivery, thus eliminating in-person brace instruction for patients. The DNP project was developed to improve patient education practices in the midst of a pandemic, and to facilitate informed consent. The project team agreed that a web-based patient education portal had potential to fill the education gap created by the pandemic. The project intervention included creation of a website and web-based patient education video library for patients served by the partnering organization. The DNP project implementation period ran from February 1, 2021 through April 29, 2021 and included patients who lived in North Carolina and had received an order for a new back brace from the partnering organization. During the implementation period, each patient who received a new back brace was instructed to view the website and video library. Surveys were sent to each participant. Results showed that 75% of patients viewed the website and video portal as instructed. All patients who watched the educational videos reported improvement in their understanding of proper back brace use. The project results support the efficacy and utility of web-based patient education programs.

Keywords: patient education, web-based patient education, facilitating informed consent, patient education during a pandemic

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Section I. Introduction

Healthy People 2020 presented a goal to increase self-management of chronic pain (Office of Disease Prevention and Health Promotion [ODPHP], 2020a, line 25). Chronic pain is a prevalent problem affecting 13.1% of US adults ages 20-69 (Shmagel et al., 2016). Appropriate orthopedic back bracing may be component of a personalized treatment plan that facilitates self-management of chronic pain. A properly fitting back brace offers a safe, non-pharmaceutical treatment option for chronic pain sufferers. Bracing outcomes are optimal when patients are educated on how and when to wear their brace. Comprehensive patient education is essential to realizing the benefits of brace wearing.

Background

The partnering organization was a small, privately-owned durable medical equipment (DME) company providing orthotic bracing services and products. The organization collaborates with healthcare providers and patients to deliver medically indicated back braces for individuals with chronic pain. The organization aims to provide braces to patients in a timely, efficient, personal manner.

Since the formation of the DME Company in 2018, there has been an undesirable number of brace refusals and returns from patients (C. Hargrave, personal communication, June 5, 2020). The coronavirus pandemic beginning in March 2020 compounded this problem. Social distancing guidelines resulted in reduced time spent with each patient and eliminated face-to-face interaction between patients and the Brace-Fitting Specialists from this organization.

Prior to this project, this organization did not have a website and did not provide written supplemental patient education upon brace delivery. Following brace delivery, the patient received one follow-up telephone call from a Brace Fitting Specialist. Aside from the telephone

contact and manufacturer instructions included with the brace, patients did not have access to supplemental educational materials. The owner of the partnering organization was interested in creating a website dedicated to patient education. He hoped patients would understand their prescribed therapy and comply with brace wear recommendations.

Organizational Needs Statement

The partnering organization needed an expanded patient education system to increase patient's knowledge and ability to make informed decisions about care. There were no benchmarks or Accountable Care Organization (ACO) metrics specifically pertaining to this problem. However, unnecessary refusals and returns were frustrating and financially stressful for the organization (C. Hargrave, personal communication, June 5, 2021). Brace refusals forced the organization to forfeit the financial benefit of delivery fulfillment. Brace returns created unnecessary and undesired work for staff. Improvements to patient education methods were essential to facilitating informed consent for bracing therapy.

Healthy People 2020 developmental objective AOCBC-15 aims to, "Increase self-management of high impact chronic pain" (ODPHP, 2020a, line 25). Appropriate use of orthotic back braces may be an important component of self-management of chronic pain (Hekmatfard et al., 2017; Paniagua-Collado & Cauli, 2018). Implementation of a program that educated patients on appropriate use of orthotic braces contributed to the achievement of this Healthy People 2020 objective.

Healthy People 2020 objective HC/HIT-8.1 aims to, "increase the portion of health-related websites that meet three or more evaluation criteria for disclosing information that can be used to access information reliability" (ODPHP, 2020b, paragraph 1). A website was created for this project. Although the website was not the primary focus of the project, creation of the site

was a positive byproduct of the project. In addition to providing a platform for patient education, the mere existence of a company website may increase public trust in the organization.

A project to improve patient education modalities aligned with all aspects of the Triple Aim. The patient experience of care was improved by providing comprehensive information before, during, and after brace delivery. Patients had access to educational materials anytime and could refer back to the educational videos long after initial brace delivery. The use of videos, rather than written information, may have helped circumvent any health literacy deficits. Ongoing access to patient education on bracing facilitated informed consent for bracing, and increased confidence that braces were being worn appropriately.

The project contributed to the improvement of health of populations by increasing patient knowledge of non-pharmaceutical modalities for pain management. Proper use of a brace may decrease opioid use, thus decreasing opioid-related side effects and overdose. Appropriate brace utilization stands to improve self-management of chronic pain and decrease unnecessary use of pharmaceutical pain therapies.

The cost per capita of healthcare was reduced by implementation of this project by decreasing overuse of pain-relieving pharmaceuticals and reducing the need for costly pain-management interventions. When a patient abandons recommended brace therapy, any benefit of brace wearing is forfeited, and the financial cost of the brace is wasted. Brace refusal may contribute to overutilization of pharmaceuticals or medical interventions for pain management, such as surgery or steroid injections. Improving patient education on back brace therapy may improve compliance with provider recommendations and stands to eliminate the need for unnecessary and costly interventions for management of chronic pain.

Problem Statement

The DME company did not have a reliable platform for patient education on orthotic bracing to reinforce the potential benefits of brace therapy. Patient education methods required improvement to facilitate informed consent for bracing.

Purpose Statement

The purpose of the DNP project was to optimize patient education methods to improve patient knowledge and facilitate informed consent for prescribed bracing therapy.

Section II. Evidence

Literature review is an integral aspect of creating a successful quality improvement project. This necessary step can guide interventions by revealing evidence-based recommendations for improvement. The literature review is essential because it reveals interventions that have been successful or unsuccessful in the past and allows experts to avoid spending time on disproven methods.

Literature Review

Databases utilized included ProQuest Central, East Carolina University's One-Search tool, and MedLine Via PubMed. MESH terms included "back bracing chronic pain compliance", "epidemiology of chronic low back pain in US", "patient education AND informed consent AND treatment outcomes", "informed consent OR informed decision making", "web-based patient education", and "motivational interviewing compliance". All results were required to provide full-text documents published in English within the past five years. The inclusion and exclusion criteria for each search are detailed in Appendix A. In total, the initial literature search revealed 756 potentially relevant results. Titles were reviewed for applicability to the DNP project based on relevance to chronic pain, informed consent, and web-based patient education systems. Eighteen articles were retained for further review. Abstracts and conclusions of the remaining 18 articles were assessed, and 13 were deemed applicable and valuable to the DNP project. Articles pertaining to back brace compliance, non-pharmaceutical pain management, patient education in chronic pain management, informed consent process improvement, web-based patient education systems, and analysis of motivation interviewing impacts were included. Additionally, two articles discussing unrelated diagnoses were retained for further review because of their focus on correlations between motivational interviewing, patient education, adherence to treatment plans,

and treatment outcomes. Excluded literature included articles pertaining to cancer treatment, pelvic supports, assessment, posture, strength training, employee health, return to work, return to sport, PTSD, psychology, studies of specific types of braces, and those with level five-seven evidence. Additionally, titles involving exercise therapy without a bracing component were excluded. Items retained in the literature review were required to have specific applicability to the concepts of back bracing, patient education, web-based patient education, informed consent process improvement, and impacts of motivational interviewing on patient adherence and treatment outcomes. A summary of findings from each retained article is provided in Appendix B, and specific inclusion/exclusion criteria are detailed in Appendix A.

Current State of Knowledge

Current literature did not confront problems with informed consent for back bracing. Data regarding general informed consent existed and recommended that providers not assume patients possess baseline medical knowledge (Weckbach et al., 2016). One retrospective study assessed patient experience with informed consent for previous surgical procedures. This study evaluated experience with *surgical* consent. However, conclusions from this study could be applied to the general concept of informed consent. Providers should provide basic medical education for patients when obtaining informed consent. Informed consent demands providers discuss the reason for the planned procedure and alternative treatment options (Weckbach et al., 2016). Additionally, patients should be allowed at least one day for consideration before providing consent for a medical procedure or therapy (James et al., 2019).

Web-based patient education programs have shown promise to increase patient knowledge and satisfaction (Alperstein et al., 2016; Dekkers et al., 2018; Dressler et al., 2019; Zomahoun et al., 2017). Further research is needed, but current data are optimistic for the future

of web-based patient education programs. Motivational interviewing shows short-term benefits but must be ongoing or paired with other interventions for maximum benefit.

Current Approaches to Solving Population Problem(s)

Literature identifying appropriate interventions to improve the process of informed consent for back bracing did not exist at the time of the literature review. Several studies have assessed the impact of web-based patient education programs on overall medical knowledge. Web-based patient education programs have shown to improve patient knowledge and satisfaction with treatment (Dekkers et al., 2018; Dressler et al., 2019). Web-based patient education programs have been a cost-effective alternative to traditional patient education methods, but further research is needed to determine the appropriate structure and content of these web-based programs (Dekkers et al., 2018).

Evidence to Support the Intervention

Overall, literature provided that patient educational methods required improvement to facilitate informed consent for medical therapies and procedures (Weckbach et al., 2016). Web-based patient education programs have proven beneficial to improving patient knowledge and satisfaction (Alperstein et al., 2016; Conn et al., 2015; Dekkers et al., 2018; Dressler et al., 2019; Zomahoun et al., 2017). For this project, a web-based system utilized promising findings from various meta-analyses to facilitate positive outcomes.

A web-based patient education portal allowed for standardization of the patient education process within The DME Company. This organization serves patients in several states across the country, and the employee training on patient education is minimal. In the social state of pandemic, a web-based patient education system allowed patients to utilize two types of learning

(auditory and visual) using videos, despite the inability to meet with an organizational representative in person.

Evidence-Based Practice Framework

Identification of the Framework

The model used to guide this project was The Planned Change Model by Ronald Lippitt, Jeanne Watson, and Bruce Westley. The Planned Change Model is a seven-step model focused on creating sustainable change within an organization. The steps in The Planned Change Model are as follows: (1) Diagnose the problem; (2) Assess the motivation and capacity for change in the system; (3) Assess the resources and motivation of the change agent; (4) Establish change objectives and strategies; (5) Determine the role of the change agent; (6) Maintain the change; and (7) Gradually terminate the helping relationship as the change becomes part of the organizational culture (Lippitt et al., 1958). This change model was appropriate for the DNP project because the desired change occurred within the organization at the process level. The Planned Change Model allowed for an external agent (the DNP student) to assist an organization in creating sustainable quality improvement. The Planned Change Model required the external agent to identify a problem within an organization, and work with organizational leadership using available resources to accomplish a realistic, predetermined goal. This model required a working relationship between the partnering organization and an external agent to facilitate quality improvement. Concerning the partnering organization, a long-term change was necessary to optimize patient education. Improved patient education facilitated informed consent for bracing therapy. The Planned Change Model required that the changes made within the organization be sustainable after completion of the project. After the project, the external agent

(DNP student) was required to gradually terminate the project-related relationship with the organization and allow the organization to assume control of the implemented change.

Ethical Consideration & Protection of Human Subjects

The DNP project was conducted within the partnering organization. There were no identified ethical concerns associated with the project. The project intervention posed equity concerns for persons who did not have Internet access. To address this issue, patients who lacked Internet access were encouraged to access the web-based patient education program using a computer at a public library. Another equity concern was for non-English speaking patients, as the web-based patient education program was published exclusively in English. Videos on the web-based program were published with subtitles, allowing non-English speaking persons to utilize translating services to facilitate widespread understanding of content. There was no potential harm or exploitation concern identified for the DNP project.

The partnering organization was a privately owned business and did not have an institutional review board (IRB). Approval for the project was obtained by the owners of the organization, and by East Carolina University DNP faculty. In preparation for implementation, the project lead completed compliance-training modules through the Collaborative Institutional Training Program (CITI). A preliminary IRB review was performed through East Carolina University. This preliminary IRB review ensured the project was focused on program development and quality improvement, rather than research. No additional approval was required for project implementation.

Section III. Project Design

The DNP project filled a gap for the partnering organization. The benefits of this project were vast. The project benefited the partnering organization, patients, and providers served by the organization. Due to the virtual nature of the intervention, individuals outside of the project's target population may also benefit.

Project Site and Population

The project site was a durable medical equipment (DME) company specializing in orthotic bracing. The organization operates in three states including North Carolina, Tennessee, and Alabama. The home office for the partnering organization is located in Memphis, Tennessee. Patients and providers served by the partnering organization come from varying locations ranging from very rural, to very urban. The population served by this organization includes adult patients living with chronic pain whose medical providers have ordered an orthotic back brace. For the purpose of the project, only patients who lived in North Carolina were included in the implementation phase.

There were several potential barriers to the project. The first challenge that was overcome was the absence of an organizational website. Building a website was one of the first tasks involved in project development, as the website served as the platform for the electronic patient education video library. Additionally, many of the patients served by The DME Company were elderly and had difficulty using a computer or mobile device to access the educational material. Insufficient Internet access was also a potential concern for some patients.

Videos were published in English with subtitles. Non-English-speaking patients may have had difficulty understanding the video content due to the language barrier. The use of

subtitles in the videos allowed patients to utilize internet-based translating services to facilitate understanding.

Facilitators for the project included a project site champion who was enthusiastic about the project concept. The project was affordable and did not put a financial strain on the project leader or the partnering organization. The pandemic and social-distancing guidelines did not impact the project, as there was no in-person contact required for project development, implantation, or evaluation. Additionally, website development resources were vast and made website development and video hosting simple.

Description of the Setting

The project was completely virtual in nature. There were no aspects of project design, development, implementation, or evaluation that required in-person contact with patients or the partnering organization. All meetings with the project coach and project site champion took place over telephone, email, or a video conference medium. Project implementation included publication of the website, and a patient education video library.

Description of the Population

The target population for the DNP project included patients living in North Carolina who were prescribed back-braces through the partnering organization. Historically, the patients served by this company are age 55 and older (C. Hargrave, personal communication, June 5, 2020). These patients are under the care of a pain management provider, and have been prescribed a back brace. The DME Company serves patients of all genders, races, and ethnicities. Patients within the target population had a chronic pain diagnosis and were in various stages of tertiary pain management.

Project Team

The project team included the DNP student, an East Carolina University project faculty member, and the project site champion. The DNP student served as the “change agent” for the purposes of the project theoretical framework. The DNP student, henceforth known as the “Project Lead”, designed, developed, implemented, and evaluated the project. The Project Lead collaborated with the Project Faculty Coach and Project Site Champion to ensure all project deliverables were of high quality, and appropriate for the target population and partnering organization.

The East Carolina University project faculty members, Dr. Tomika Williams, and Dr. Jan Tillman, henceforth known as the “Project Coach(es)”, served as the project coaches and advisors. The Project Coaches supervised the progress of the project and made suggestions for project improvement. The Project Coaches worked with the Project Lead to develop meaningful deliverables, realistic outcomes, and appropriate evaluation criteria.

The Project Site Champion is referred to as the “Project Site Champion”. The Project Site Champion is the owner of the partnering organization. This person collaborated with the Project Lead to ensure all project deliverables complied with organizational standards and were appropriately integrated into the organizational operations. The Project Site Champion served as an expert consultant to the Project Lead, and acted as the liaison between the Project Lead and the partnering organization.

Project Goals and Outcome Measures

The primary goal of the DNP project was to improve patient education on back bracing. This outcome was measured by employing a brief survey (see Appendix C) that assessed the utility of the project intervention. Project success would be defined as at least 75% of patients

reporting improved understanding of back bracing (question number four on patient survey, see Appendix C).

Description of the Methods and Measurement

When a pain management provider prescribed a brace through the partnering organization, the provider gave the patient a pre-delivery flyer (see appendix D). The pre-delivery flyer provided the patient with realistic expectations for brace delivery, website address, and instructions to view the patient education videos. The pre-delivery flyer was developed in collaboration with the Project Site Champion and included information requested by the Site Champion. The pre-delivery flyer was reviewed and approved by the Project Site Champion during a video conference on September 14, 2020.

When the brace-fitting specialist made initial contact with the patient, the fitting specialist asked the patient if they viewed the patient education videos. If the patient had not viewed the videos, the fitting specialist instructed the patient to do so. Upon delivery of the brace, the fitter also sent the patient survey, along with a pre-posted envelope. Each patient was instructed by the fitter to complete the survey and return it in the pre-posted envelope. The patient survey was developed in collaboration with the Project Site Champion. The Project Site Champion reviewed and approved the patient survey during a video conference on September 14, 2020.

Discussion of the Data Collection Process

The Brace-Fitting Specialist recorded the number of surveys sent, and the dates in which they were sent on the project-tracking tool (see Appendix E). Once returned, the Project Lead analyzed, recorded, and evaluated patient survey responses. Survey responses were recorded on the project-tracking tool (see Appendix E). Survey response rate was also be calculated and

recorded. Survey responses were relayed to the project site champion through bi-weekly phone meetings throughout the implementation period.

Implementation Plan

A project implementation plan was developed based on the project's theoretical framework, The Planned Change Model by Ronald Lippitt, Jeanne Watson, and Bruce Westley (See Appendix F). Each step from The Planned Change Model was listed, along with coinciding project-related tasks for each step. The implementation tool included expected dates for each task to be completed.

Once completed and approved by the Project Site Champion, the Project Lead published the website and patient education videos, and delivered pre-delivery flyers to ordering physician's offices. Staff at the ordering physician's office were instructed to discard their old pre-delivery flyers and to begin distributing the new flyer to patients who were prescribed a brace. At that time, implementation officially began.

During the implementation period, the Project Lead created a PowerPoint Presentation that was distributed to the Brace-Fitting Specialists. The Brace-Fitting specialists were instructed on how to access the new website and educational videos, and how to present this information to patients. The fitting specialists were instructed to wait until the initial project implementation period was over to begin using the website and videos with their patients. At the completion of the project implementation period, the project was disseminated throughout the entire DME Company. After organization-wide project dissemination, the website and educational videos will be recommended to all patients served by the partnering organization.

The PDSA model was used throughout the implementation period. PDSA cycles each lasted two weeks and were reviewed during bi-weekly meetings between the Project Lead and

Project Site Champion. Updates and improvements to the project were documented on PDSA charts (Appendix G). Survey results and project-specific data were recorded in an Excel spreadsheet created by the DNP student (Appendix E).

Timeline

Steps one through three of the implementation plan (see Appendix F) were completed as part of the project development stage. Step one was to diagnose the problem, step two was to assess the motivation and capacity for change within the system, and step three was to assess the resources and motivation of the change agent (Lippitt et al., 1958). As established, the change agent was the Project Lead.

Step four of the implementation plan was to establish change objectives and strategies (Lippitt et al., 1958). Step five was to determine the role of the change agent (Project Lead). These steps were completed during the project development stage. Tasks involved with these steps included creating a website, patient education videos, patient survey, pre-delivery flyer, project tracking tool, and project implementation tool. These tasks were completed on November 13, 2020. A meeting with the Project Site Champion occurred on November 13, 2020 to discuss and review the completed project deliverables. The Project Site Champion approved all project deliverables during this meeting.

Step six in the implementation plan was to maintain the change (Lippitt et al., 1958). The steps identified to complete step six of the implementation plan included publication of project deliverables, and monitoring of project progress to ensure there were no technical barriers to success. Project implementation began on February 1, 2021 and ran through April 26, 2021. The Plan, Do, Study, Act (PDSA) implementation methodology was used to guide project implementation. The PDSA cycles ran for two weeks at a time, and the Project Lead and Project

Site Champion formally evaluated the project status every two weeks during scheduled bi-weekly meetings. Summaries of PDSA cycles are located in Appendix G.

Step seven in the implementation plan was to gradually terminate the helping relationship between the change agent (Project Lead) and the partnering organization (Lippitt et al., 1958). During this step, the Project Lead was allowed to maintain a professional relationship with the partnering organization, but no longer served as the project facilitator. Step seven required all project management tasks be transferred to the organization for long-term maintenance. Step seven was completed on April 27, 2021, when all project-related tasks and maintenance duties were transferred to a staff member at the partnering organization. A visual representation of the project timeline can be found in Appendix H.

Section IV. Results and Findings

Project specific data included survey responses from patients in North Carolina who received a back brace during the project implementation period. There were no new orders for knee braces during the implementation period. Over the course of the twelve-week implementation period, eight patient surveys were sent and returned to the Project Lead. Feedback on the project from the partnering organization was given during bi-weekly meetings between the Project Site Champion and the Project Lead.

Results

Overall, survey responses were positive. Throughout the implementation period, eight patients received a new back-brace from the partnering organization. All eight patients were advised to view the website and educational video library. Each participant was given a survey (Appendix C) to provide feedback on his or her experience with the project intervention. All eight participants completed and returned their survey.

The survey included five questions to evaluate the impact of the organizational website and patient education video library. The first question required participants to report whether they were aware of the existence of the patient education videos, and if so, how they learned about this resource. All eight participants indicated that they were aware of this resource and that they learned about the educational videos through their brace-fitting specialist.

The second survey question required participants to indicate whether they had watched the educational videos. Six out of eight participants (75%) indicated that they viewed the videos, and that the videos were helpful to increase their confidence in wearing their brace appropriately. Two of the survey participants (25%) indicated they had not viewed the videos.

The third survey question inquired about any further questions that patients had after reviewing the educational videos. Two survey participants (25%) failed to answer this question. Six participants (75%) answered “no”, they did not have any unanswered questions after viewing the videos.

The fourth survey question asked participants to indicate whether the videos were helpful overall, and whether the videos helped them understand how to use their brace properly. Two participants (25%) did not answer this question. Six participants (75%) indicated, “yes”, that the videos were helpful in understanding proper brace-wear.

The final survey question requested that the survey participants list any suggestions to improve customer service. None of the survey participants gave suggestions to improve customer service. Seven participants left this question blank, and one wrote “none” as the response. Detailed responses to survey questions are included in Appendix E.

Additionally, the number of website and video views were tracked throughout the implementation period. The website received 223 views throughout the implementation period. There is no way to determine if the website views were from patients, staff members, or simply from an uninvolved person who happened to find the website from a search engine. The first video (Unboxing Your Brace) received nine views during project implementation. The second video (Wearing and Adjusting Your Back Brace) received nine views, and the third video (Wearing and Adjusting your Knee Brace) received four views.

Discussion of Major Findings

Overall, the project was successful. The majority of participants indicated that the website and videos were helpful. The patients who participated in project implementation, the

Project Site Champion, and the partnering organization reported satisfaction with the project and feedback received.

All project participants reported learning about the website and educational videos from their Brace Fitting Specialist. One piece of project implementation included distribution of a flyer to all patients for whom a brace had been ordered. This flyer gave instructions to visit the website and view the educational videos. The partnering physician confirmed that the new flyer was being distributed when brace orders were initiated. Interestingly, all patients reported learning about the website and video library from their Brace Fitting Specialist, despite the information that was provided on the flyer they received at the time their device was ordered. Twenty-five percent of project participants did not view the website or educational video library.

Findings from this project are reflective of current literature concerning web-based patient education. Current evidence supports web-based patient education as a means to improve patient satisfaction and knowledge of healthcare practices (Dekkers et al., 2018). Further study is needed to fully assess the impact and potential consequences of web-based education systems. However, this project is a small-scale example of how web-based patient education can enhance healthcare.

Section V. Interpretation and Implications

Costs and Resource Management

Monetary costs of the DNP project are detailed in Appendix I. Costs of project included website hosting and creation, and DocuSign subscription to facilitate course-required signatures. Costs were covered in full by the Project Site Champion.

Project-related labor was completed by the Project Lead. Project-related labor included creation, publication, and maintenance of the website and patient education video library. The Brace-Fitting Specialist instructed patients to view the website and educational video library and sent each patient a survey about their experience. Surveys were sent with the new brace through a parcel delivery service. The Project Lead evaluated survey responses. The DNP student (Project Lead) spent 121 hours on project development, implementation, and management. The Project Site Champion spent eight hours on project-related meetings and reviewing project materials.

As the project intervention is adopted by the entire organization, and sustained for the long-term, the costs will remain constant. Ongoing expenses for project maintenance will include annual web-hosting fees and several hours of labor for website maintenance. DocuSign will no longer be an expense, as this subscription was required for satisfaction of University requirements for the DNP project course.

Implications of the Findings

According to project data, 75% of patients were happy with the new website and educational videos. Six out of eight patients reported improved confidence with brace-wearing after watching videos. Of the six patients that watched the educational videos, 100% confirmed that the videos were helpful and denied having any unanswered questions after viewing the

project materials. The project intervention stands to alleviate brace-wearing uncertainty, as many questions will be answered by the website and video library. Ultimately, the project was mutually beneficial to the staff and patients served by the partnering organization.

Implications for Patients

The nature of a back brace requires visual, hands-on education for proper application. In the midst of the Coronavirus pandemic, social distancing requirements created a barrier to customized, in-person education. The web-based patient education system proved to be beneficial in providing education even when safe in-person contact was not possible. After viewing the educational video library, patients can feel at ease knowing they are wearing their brace appropriately.

Web-based patient education systems stand to improve patient satisfaction (Dekkers et al., 2018). Online education offers a cost-effective alternative to traditional patient-teaching methods. Research shows that patients who used a combined education method including in-person and web-based education were more satisfied with their healthcare experience than those patients who did not utilize online education interventions (Dekkers et al., 2018).

Implications for Nursing Practice

Patient education is a major nursing function. This function can be enhanced with the use of web-based systems that allow for continual access even after initial education is given. The concept of web-based education, particularly in the form of videos, could theoretically translate to other important healthcare topics, like diabetes or post-operative care.

The concept of web-based patient education is still in its infancy. Expansion of web-based patient education to other realms of healthcare could create jobs for nurses. Online education portals will require maintenance and continual quality improvement, and nurses are

ideally suited to fill these future job openings because of their training and experience in patient education (Bastable, 2019).

Impact for Healthcare System(s)

One limitation of in-person patient education is its time-limited nature. Traditionally, patient education is given in one or more short sessions. Web-based patient education offers the advantage of continual accessibility, which can aid in reinforcement and reiteration of important concepts. The future of patient education can be improved by creating web-based educational portals that allow for ongoing access by patients. The web-based educational portal allows patients to review information at anytime during their treatment, even after the conclusion of in-person contact.

Sustainability

The DNP project intervention is sustainable. Ongoing requirements for future success of the project includes labor for website and video portal maintenance, and payment of web-hosting fees. The Project Site Champion assumed responsibility for the monetary expenses of this project at the time of project development. The partnering organization plans to continue using the project intervention indefinitely and is prepared to maintain the technical and monetary burden of the new website and video portal. A DME Company staff member was tasked with reviewing the website and videos periodically for potential updates. Development of new videos will be required as new orthotic devices or new research become available.

Dissemination Plan

The DME Company brace fitters are already trained on the project intervention. One aspect of project implementation included creation of fitter-training materials and delivery of these materials. Fitter training materials are shown in Appendix J. All Brace-Fitting Specialists

confirmed receipt and understanding of educational materials. At completion of the implementation period, the Project Site Champion instructed all Brace-Fitting Specialists to begin using the website and video portal. Staff members have been trained on how to present the project intervention to patients, and fitting specialists have been instructed to begin informing patients of the intervention and how to access the project materials.

The capstone of the project included a formal presentation at East Carolina University. The DNP student, DNP faculty, and DNP student colleagues attended the presentation. A poster was displayed during a ten-minute presentation and five-minute question and answer period. The poster and presentation summarized the DNP project and provided an overview of the project results and implications. The poster is included in Appendix K.

Section VI. Conclusion

Limitations and Facilitators

The Coronavirus pandemic limited the number of patients seen in the partnering providers office during the implementation period. Consequently, the number of back-brace orders was also decreased. Only eight back-brace orders were received during the implementation period, which limited the amount of project-related feedback received.

Of the eight project participants, one was unable to access the website and video portal because of lack of Internet access. The Brace Fitting Specialist encouraged the patient to access the videos through a neighbor's device or a public library, but the patient declined. Lack of Internet access will likely be a persistent problem for a small portion of patients served by the partnering organization. However, the majority of project participants were able to access the new website and video portal with ease. Internet accessibility prevented one patient from accessing the project materials but enabled eight patients to access educational materials that would not have been available without this project.

The enthusiasm and support of the Project Site Champion was a major facilitator to success of the DNP project. The Project Site Champion was passionate about the project from the beginning and displayed his commitment to success by assuming responsibility for the monetary costs of the project. Support of the Project Site Champion assisted to keep the flow of the project going, and to keep spirits of the Project Team high. The Project Site Champion's willingness to provide monetary support for the project will facilitate project dissemination and continuation.

Recommendations for Others

The results of this project support the benefits of creating web-based education portals to facilitate patient education, improve informed consent processes, and improve patient

satisfaction. Successful adoption of this project concept would require thorough identification of educational needs, and creation of a simplistic system that is easily navigated by internet-novices.

The concept of this project has potential to be broadened in scale. The COVID-19 pandemic has changed the way medical professionals provide patient care and education. Web-based systems can fill the gap in health education that has been created by pandemic-related social distancing guidelines.

Although the website and video portal are advertised on the pre-delivery flyer (Appendix D), the importance of verbal instructions to visit the website and video portal are paramount. All patients from the implementation period reported learning about the website and video portal through their Brace Fitting Specialist. This project demonstrated the importance of thorough education for staff members on presenting the web-portal to patients.

Recommendations Further Study

Similar projects could include other web-based educational programs to fill gaps in care created by the COVID-19 pandemic. This project stands to benefit other DME companies that offer similar services. The idea of web-based education stands to benefit all other areas of healthcare. A system that allows for continued access for reeducation and reinforcement has potential to improve the informed consent process, patient satisfaction, and healthcare outcomes. Surgical practices may utilize this technology to increase patient/family understanding of surgical procedures, expected outcomes, and surgical recovery.

A web-based patient education system is a beneficial tool, but does not replace personalized care from a qualified healthcare provider. Future projects should bear in mind that the web-based education system is merely a tool to enhance current practices. Further research

on the impact and utility of web-based portals is recommended. However, current data on web-based patient education are promising.

Final Thoughts

The primary objective of the DNP project was to increase patient education on orthotic bracing to facilitate informed consent. Informed consent for orthotic bracing requires that patients have a thorough and realistic understanding of how and when to wear their brace. The concept of a web-based patient education system mitigates the gap in education created by pandemic-related social distancing guidelines.

The project intervention included a newly developed website and educational video portal to be used as a supplement for in-person education. Overall response to the web-based patient education portal was positive. During the implementation period, 75% of brace recipients utilized the project intervention. Of those patients, 100% reported that the website and videos were beneficial to their knowledge and understanding of their new device. The Project Site Champion (owner of the partnering organization) was thrilled with the success of the project and is anxious to disseminate the intervention throughout the entire company.

The idea of expanding web-based patient education to other arenas of healthcare is exciting. Web-based healthcare education has a place in the modern world, particularly in the current state of pandemic. In an ever-evolving, technically savvy world, healthcare organizations must adapt to maintain patient satisfaction and positive outcomes. Creation of web-based patient education portals will modernize the way patients receive information and enhance the experience of patients and providers alike.

Completion of this project satisfies the American Association of Colleges of Nursing's requirements for graduates of Doctor of Nursing Practice programs. A list of each DNP essentials and the activities that correspond with each essential is detailed in Appendix L.

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<https://10.1093/ije/dyw273>

Appendix A

Literature Search Log

DNP Project

| Student: Jordan R. Wattenburger | | | Date of Submission: | | |
|-------------------------------------------------------------------------------------------------------------|---------------------------|-----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Project Title: Improving Patient Education on Orthotic Bracing to Facilitate Informed Consent for Treatment | | | | | |
| Date of Search | Database | Key Word Searches | Limits | # of Citations Found / Kept | Rationale for Inclusion / Exclusion (include rationale for excluding articles as well as for inclusion) |
| 6/27/20 | Laupus Library One-Search | "Back Bracing Chronic Pain Compliance" | Inclusion Criteria: 5 year publication period, English language, medicine and public health disciplines, Journal articles, Full-text available. Exclusions: child, children, Endocrine & Metabolism, psychology, religion, denistry, engineering, languages and literatures, social welfare & Social work, drama, education, knee, return to sport, ultrasound, adolescent, 1506, anterior cruciate ligament. | 69 found, 2 kept | Kept articles directly related to project topic based on review of titles. Reviewed abstract, results, and conclusion sections to determine applicability to the project topic. Two relavent articles were identified and retained for further review. |
| 6/27/20 | Laupus Library One-Search | "Epidemiology of chronic low back pain in US" | Inclusion Criteria: Full text, 5 year publication limit, English language, scholarly journals, Location: United States, Discipline: Medicine. Exclusions: 1506, anxiety, child, children, depression, diabetes, female, male, pediatrics, prevention, psychiatry, women, abridged index medicus, adolescent, association, clinical trials, health aspects, index medicus, medical research, medicine (experimental), mental depression, mental disorders, mental health, obesity, prospective studies, research, research articles, biology and life sciences, womens health, mortality, hospitals. | 468 articles found, 1 kept. | I was specifically looking for an article identifying the prevalence of chronic pain in the US. The first article in my search provided the necessary data. |

| Date of Search | Database | Key Word Searches | Limits | # of Citations Found / Kept | Rationale for Inclusion / Exclusion (include rationale for excluding articles as well as for inclusion) |
|----------------|--------------------|-----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 7/12/20 | ProQuest Central | "Patient education AND informed consent AND treatment outcomes" | Advanced Search: Patient Education AND Informed Consent AND treatment outcomes. Inclusion Criteria: Limit to full-text, peer-reviewed. Publication date: After July 12, 2015. Source Type: Evidence Based Healthcare. SUBJECT: Systematic review. EXCLUDED subjects: clinical trials, mental disorders, mental health, womens health, mortality, medical research, pregnancy, children & youth, research, teenagers, researchers, cancer therapies, mental healthcare, randomization, pediatrics, human immunodeficiency virus (HIV), psychiatry, acquired immunodeficiency syndrome, | 182 articles found, 1 kept. | Screened titles of each article for applicability to the DNP project. Three relevant articles identified. Abstracts of these 3 articles were reviewed, and one article was kept for further review. |
| 7/12/20 | ProQuest Central | "Informed consent OR informed decision making" | Advanced search: Informed consent OR informed decision making. Inclusion Criteria: Limited to articles whose titles contained MESH terms, full-text, peer-reviewed. Published after July 12, 2015. | 8 articles found, 3 kept. | Abstract of 8 articles were reviewed. Four articles deemed applicable to project topic. One of these articles was subsequently excluded due to the low level of evidence it contained. Total number kept after review: 3. |
| 7/15/20 | Medline Via PubMed | "Web-based patient education" | Advanced search: "Web based patient education". Inclusion Criteria: Limited to full-text articles published in English within the past five years. Desired language of publication: English. Desired species of results: Humans. Desired subject of results: Systematic reviews. | 14 articles found, 2 kept | Titles were reviewed for project applicability. Four articles identified as appropriate. Abstracts and conclusions for each of these four articles and three were reviewed and deemed applicable to the DNP project. One article contained level seven evidence and was excluded. Final number of articles kept from this search was two. |
| 7/15/20 | Medline Via PubMed | "Motivational interviewing compliance" | Advanced search: "Motivational interviewing compliance". Inclusion Criteria: Limited to full-text articles published in English within the past five years. Desired species of results: Humans. Desired subject of results: Systematic reviews. | 15 articles found, 3 kept | Titles were reviewed for project applicability. Four articles identified as appropriate. Abstracts and conclusions for each of these four articles. Three were deemed applicable to the DNP project. |

Appendix B

Literature Matrix

| Authors | Year Pub | Article Title | Journal | Level of Evidence | Sample method | Comments/critique of the article/methods GAPS |
|---------------------------------------------------------------------------------|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Hekmatfard, M., Sanjari, M., Maroufi, N., Saeedi, H., Ebrahimi, E., Behtash, H. | 2017 | A Preliminary Study of The Objective Measurement of Compliance Rates for Semirigid Lumbar-Support Use in Patients with Chronic Nonspecific Low Back Pain: How Important is Compliance rate? | <i>Asian Spine Journal</i> | <u>Level 3 Evidence.</u> | This study followed 12 patients who were prescribed lumbar support devices for six weeks. | The authors found that compliance with back-brace wear-time recommendations varies from 58.82%-100%, and degree of pain and disability did not correlate with brace wearing compliance. Limitations: small sample size (only 12 participants). Specific diagnosis for each patient was not identified. Usefulness: Somewhat useful in speculating the efficacy and general compliance trends for back-brace wearers. Synthesis: Many patients are compliant with brace-wearing recommendations. In this study, there was no significant correlation between brace-wearing compliance and pain/disability improvement. |
| Paniagua-Collado, M., Cauli, O | 2018 | Non-pharmacological Interventions in Patients with Spinal Cord Compression: A Systematic Review. | <i>Journal of Neuro-Oncology</i> | <u>Level 1 Evidence.</u> | Literature search for topics of interest. 2401 articles were found. Duplicate and irrelevant articles were eliminated and the remaining articles were screened for appropriate data inclusion. After screening process, 11 articles remained and were included in the systematic review. | Current evidence supports the efficacy of back-bracing for treatment of spinal compression fractures. Bracing was most effective when combined with another therapeutic option, like kyphoplasty. Further studies on efficacy of back bracing as an alternative to surgical intervention are recommended. |
| Shmagel A., Foley, R., & Ibrahim, H. | 2016 | Epidemiology of Chronic Low Back Pain in US Adults: Data from the 2009-2010 National Health and Nutrition Examination Survey | <i>Arthritis Care & Research</i> | <u>Level 3 Evidence</u> | NHANES methodology for sampling: National Health and Nutrition Examination Survey - utilizes interviews and examinations performed in a mobile examination center. | The purpose of saving this article was for statistical data on the prevalence of chronic pain among US adults. According to this article, 13.1% of US adults ages 20-69 years suffer from chronic pain. |
| James, J. T., Eakins, D.J., & Scully, R.R. | 2019 | Informed Consent, Shared-Decision Making and a Reasonable Patient's Wishes based on a cross-sectional, National Survey in the USA Using a Hypothetical Scenario. | <i>BMJ Open</i> | <u>Level 3 Evidence</u> | 76 nursing students, 63 healthcare educators, and 1067 US adults were "recruited". The article does not claim to have randomized the sample, and recruitment methods are not disclosed. | Sampling methods not identified. Demographic data for the largest sample group not provided. Survey was conducted online, so sampling bias exists because people without internet access could not participate. Additionally, the survey was only available in English, therefore opinions of non-english-speaking individuals is not represented. |
| Weckbach, S., Kocak, T., Reichel, H., & Lattig, F. | 2016 | A Survey on Patients Knowledge and Expectations During Informed Consent for Spinal Surgery: Can We Improve the Shared Decision-Making Process? | <i>Patient Safety in Surgery</i> | <u>Level 3 Evidence</u> | Former surgical patients were contacted and queried about their willingness to participate in the retrospective study. | Patient consent to surgery has less to do with medical knowledge and more with lack of knowledge of alternative treatment options. Providers should be diligent to inquire about patients medical knowledge and educate patients on the planned procedure, along with expected recovery duration, and potential complications. Providing more indepth patient education will improve patient satisfaction. |

| | | | | | | |
|-----------------------------------------------------------------------------------------------------------------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Dekkers, T., Melles, M., Groeneweld, B.S., de Ridder, H. | 2018 | Web-Based Patient Education in Orthopedics: Systematic Review | <i>Journal of Medical Internet Research</i> | Level 1 Evidence | Thorough literature search was conducted for studies evaluating patient satisfaction and knowledge after participating in web-based patient education. Only full-text, peer-reviewed articles published in English were included. | 9/10 Studies reported increased patient knowledge after participation in web-based patient education programs. 7/10 Reported increased patient satisfaction with care. |
| Dressler, C., Lambert, J., Grine, L., Galdas, P., Paul, C., Zidane, M., Nast, A. | 2019 | Therapeutic Patient Education and Self-Management Support for Patients with Psoriasis - A Systematic Review | <i>Journal of Der Deutschen Dermatologischen Gesellschaft</i> | Level 1 Evidence | Literature search utilizing the Living Systemic Reviews system and the PRISMA checklist, and AMSTAR II. Every three months, the authors searched for newly published studies to include. | The article was focused on motivational interviewing in the treatment of psoriasis; however - this concept may be applicable to other diagnoses, such as chronic pain. |
| Alperstein, D., & Sharpe, L. | 2016 | The Efficacy of Motivational Interviewing in Adults with Chronic Pain: A Meta-Analysis and Systematic Review. | <i>Journal of Pain</i> | Level 1 evidence | Literature review utilizing the ancestry method (by handsearching the reference lists of empirical articles and relevant review articles) - Initial search resulted in 1180 studies. After duplicates were removed, the remaining studies were evaluated by titles and abstracts. Full-text of 73 articles were reviewed. Seven were deemed appropriate for this systematic review. | Significant short-term improvements were noted in medical compliance after motivational interviewing techniques were implemented. However, compliance rates reverted back to pre-motivational interviewing status at the 6-month interval. |
| Conn, V.S., Ruppap, T.M., Chase, J.D., Enriquez, M., & Cooper, P.S. | 2017 | Interventions to Improve Medication Adherence in Hypertensive Patients: Systematic Review and Meta-Analysis | <i>Current Hypertension Reports</i> | Level 1 Evidence | Literature search for studies involving medication adherence. Articles were reviewed for applicability and appropriateness to the systematic review. | Motivational interviewing had the greatest positive impact on improving patient compliance with antihypertensive therapies. Although this study focuses on antihypertensive therapy, the results could potentially be applied to other diagnoses, such as chronic pain. |
| Zomahoun, H.T.V., Guenette, L., Gregoire, J., Lauzier, S., Lawani, A.M., Ferdynus, C., Huiart, L., & Moisan, J. | 2017 | Effectiveness of Motivational Interviewing Interventions on Medication Adherence in Adults with Chronic Diseases: A Systematic Review and Meta-Analysis | <i>International Journal of Epidemiology</i> | Level 1 Evidence | Literature search for studies of the desired topic. Duplicate studies were removed. Titles and abstracts of remaining studies were screened. Full-text of remaining articles were reviewed for applicability. Nineteen studies were deemed applicable to the meta-analysis topic, and 16 were included in the final assessment. | Motivational interviewing shows positive, yet modest effect on improving medication adherence in individuals with chronic illness. |

Appendix C
Project Evaluation Survey



Please take a moment to complete this brief survey to help us improve our services.

1. Are you aware of the patient education videos available on our website?
YES NO

• If so, how did you find out about this resource?

My doctor told me about it.

My brace-fitting consultant told me about it.

I searched the Internet for your website and found it myself.

Other: _____

2. Did you visit the website and view the educational videos?
YES NO

○ If so, did you find the videos helpful?
YES NO

○ Do you feel more confident about wearing your brace after viewing the videos?
YES NO

3. Do you have questions about your brace that were not addressed in the patient education videos?
YES NO

○ If so, how can we help you? _____

4. Overall, do you feel that our website and educational videos helped you understand how to use your brace?

YES NO

5. What other suggestions do you have to improve our customer service?

Appendix D

Pre-Delivery Flyer



Welcome to the [redacted] family.
We look forward to serving you.

At [redacted], Customer service is our highest priority. In keeping with this core value, we are dedicated to providing high-quality bracing products and a personal level of service that fits your needs.

Your medical provider has ordered a brace for you today.

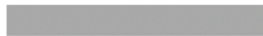
Here's what happens next:

1. Our staff will contact your insurance company for prior-authorization.
 - If your insurance approves your brace, we will proceed to step number two.
 - If there is a problem obtaining authorization from your insurance, you will receive a phone call from our office to discuss other options.
2. Once insurance is approved (or other arrangements have been made), you will be contacted by one of our certified brace fitting specialists.
 - Our specialists will guide you through the delivery and fitting process.

If you do not hear from our office within 72 hours of your doctors visit, please feel free to call us at [redacted].

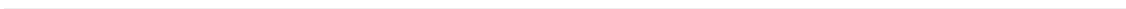
In the meantime, please visit our website and familiarize yourself with your new brace. Our website is dedicated to enhancing your bracing experience.

- Our FAQ page is a great place to start.
- The Patient Education videos will help you understand how to wear your brace appropriately.



Thank you for the opportunity to serve you!

In Good Health,
Your [redacted] *Team*



Appendix E

Project Tracking Tool

| Project Tracking Tool | | | | | | | | | |
|-----------------------|------------------|----------------------|--------------------------------------------------------|--------------------------------------------------------|------------------------------------------|------------------------------------------------------------------------------------|----------------------------------------------------|--------------------------------------------------------|-----------------------------------------------|
| Patient number | Date Survey Sent | Date Survey Returned | Was the patient aware of the patient education videos? | Did the patient visit the website and view the videos? | Did the patient find the videos helpful? | Does the patient feel more confident about brace-wearing after viewing the videos? | Overall, did the videos improve patient education? | Other questions not answered by the website and videos | Other suggestions to improve customer service |
| 1 | 2/1/21 | 2/5/21 | yes | no | no answer | no answer | no answer | no answer | no answer |
| 2 | 2/1/21 | 2/7/21 | yes | yes | yes | yes | yes | no | none |
| 3 | 2/1/21 | 2/7/21 | yes | no | no answer | no answer | no answer | no answer | no answer |
| 4 | 2/4/21 | 2/10/21 | yes | yes | yes | yes | yes | no answer | no answer |
| 5 | 2/22/21 | 2/26/21 | yes | yes | yes | yes | yes | no | none |
| 6 | 2/22/21 | 2/26/21 | yes | yes | yes | yes | yes | no | none |
| 7 | 2/22/21 | 2/27/21 | yes | yes | yes | yes | yes | no | none |
| 8 | 2/29/21 | 3/4/21 | yes | yes | yes | yes | yes | no | none |

Website views within the past 30 days:

| | |
|----------|----|
| 2/25/21: | 56 |
| 3/27/21: | 55 |
| 4/27/21: | 50 |
| 5/26/21: | 62 |

Video Views (total since publication):

| | |
|----------------------------------|---|
| Opening the brace: | 9 |
| Wearing and adjusting back brace | 9 |
| Wearing and adjusting knee brace | 4 |

Appendix F

Project Implementation Tool

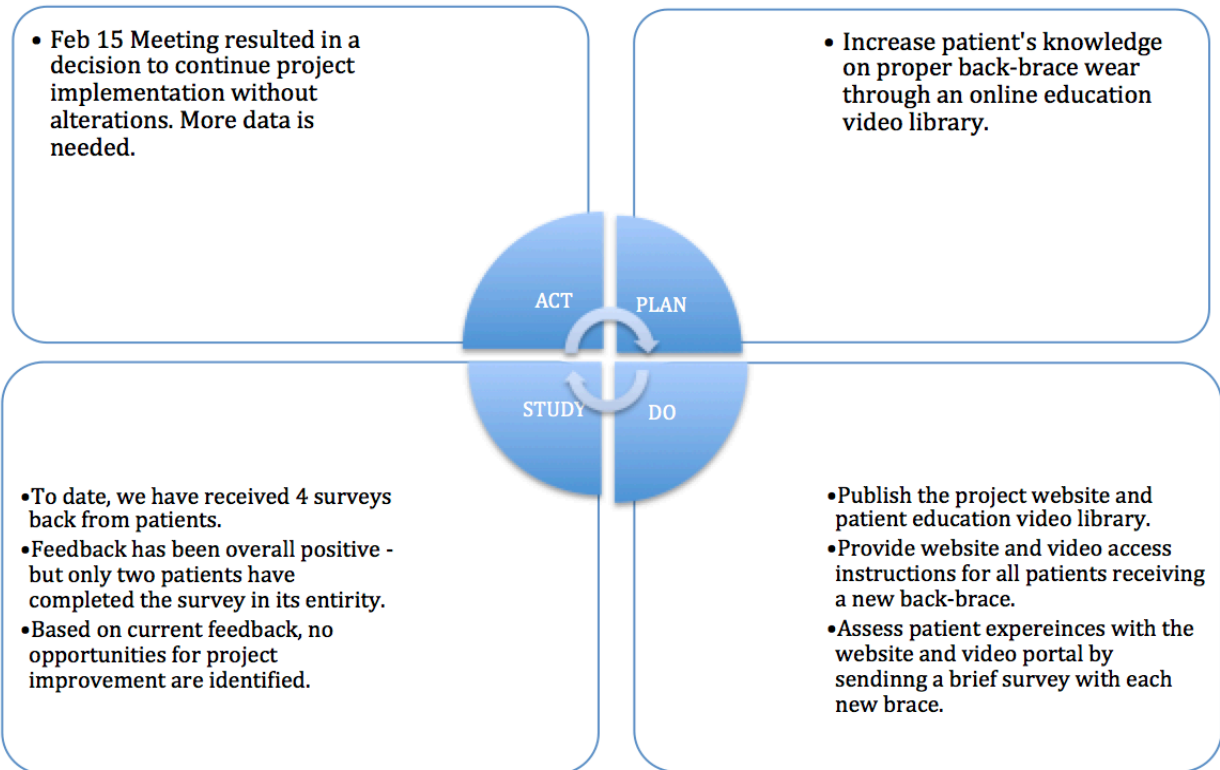
| | | |
|-----------------------------------------------------------------------|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Phase 1: Diagnose the problem | Completed in DNP1 | Problem: Since the onset of the COVID-19 pandemic, patient education modalities within the partnering organization have been limited due to social distancing restrictions and inability to meet with patients in person. |
| Phase 2: Assess the motivation and capacity for change in the system. | Completed in DNP1 | Owner of The DME Company is very excited about the idea of creating a web-based patient education system. The project idea was well received and supported by the organizational staff. |
| Phase 3: Assess the resources and motivation of the change agent. | Completed in DNP1 | <p>The DNP student is the change agent. Building a website is an integral part of this project because it will provide a platform for project implementation. Website hosts were reviewed for cost-benefit purposes, and ideal fit for the partnering organization. Cost of the project should easily remain below \$500, which is reasonable and feasible for the change agent.</p> <p>The change agent is quite motivated to complete this project, as it is an integral piece of the graduation requirements for the change agent's academic endeavor.</p> <p>The change agent is also motivated because of the obvious benefit this project will provide to the partnering organization and to the patients served by this organization.</p> |
| Phase 4: Establish Change objectives and strategies. | Completed November 13, 2020. | <p>Change Objectives:</p> <ol style="list-style-type: none"> 1. Create a website for the partnering organization that is mutually agreeable to the change agent and the partnering organization. 2. Create patient education videos that will be posted to the website. Video topics include (a) wearing and adjusting the brace; (b) Unboxing the brace; and (c) Wearing the knee brace safely and appropriately. 3. The goal is to improve patient education. Patients will be surveyed to determine if the intervention was successful in improving patient education. 4. Flyers will be created for patients. Ordering providers will provide patients with the flyer, which includes the website address and instructions to view the patient education videos. |
| Phase 5: Determine the role of the change | Completed November 13, 2020. | <p>Role of the change agent:</p> <ol style="list-style-type: none"> 1. Design and create all project deliverables, including the organization's website, patient education videos, flyer, |

| | | |
|-----------------------------------------------------------------------------------------------------------------|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| agent | | <p>and patient survey.</p> <ol style="list-style-type: none"> 2. Implement the project by delivering the flyers to organizational partners (medical offices that order braces through the partnering organization). Send surveys with each brace. Publish the website and patient education video library. 3. Present all project deliverables to the project site champion to ensure all items are mutually satisfactory. |
| Phase 6: Maintain the change. | February 1, 2021 – April 26, 2021. | <ol style="list-style-type: none"> 1. Project implementation will begin on February 1, 2021. 2. Project will be monitored for appropriate accessibility and effective implementation. |
| Phase 7: Gradually terminate the helping relationship between the change agent and the partnering organization. | July 14, 2021 | <ol style="list-style-type: none"> 1. Ensure the website upkeep instructions and fees are transferred to the project site champion at completion of the project. 2. Assess organizational satisfaction with the project and make applicable modifications to ensure project sustainability. 3. Transfer all project deliverables (website management log-in information, Original copies of flyer) to project site champion for future use. <p>The change agent will resign the position of project-leader by July 14, 2021. The change agent may still associate with the project site partner in a professional manner, but will no longer manage the project intervention. All aspects of the quality improvement project will be handed over to organizational staff for future management and maintenance.</p> |

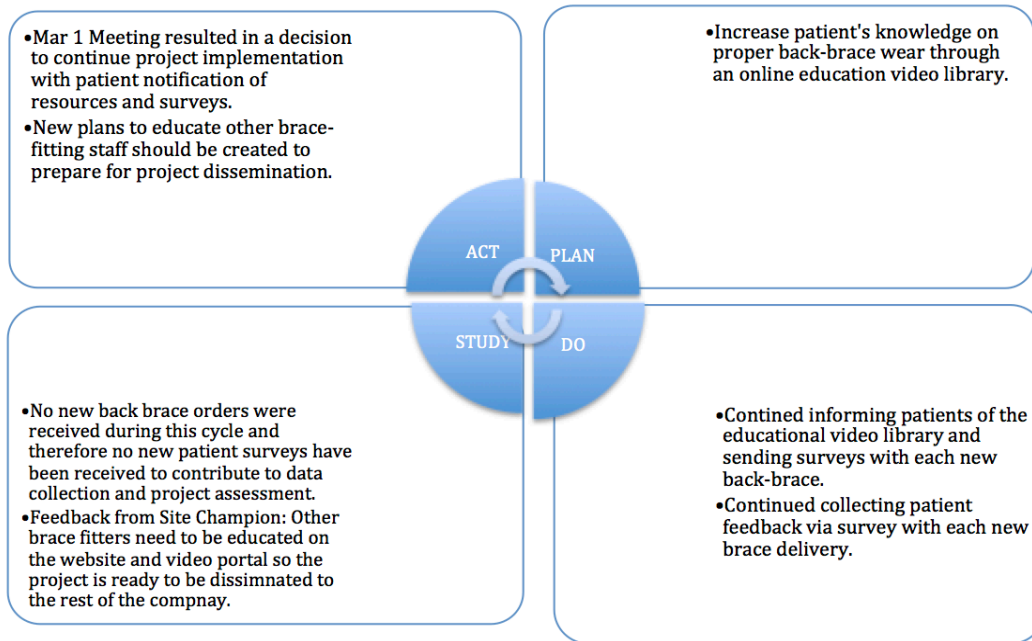
Appendix G

PDSA Cycle Charts

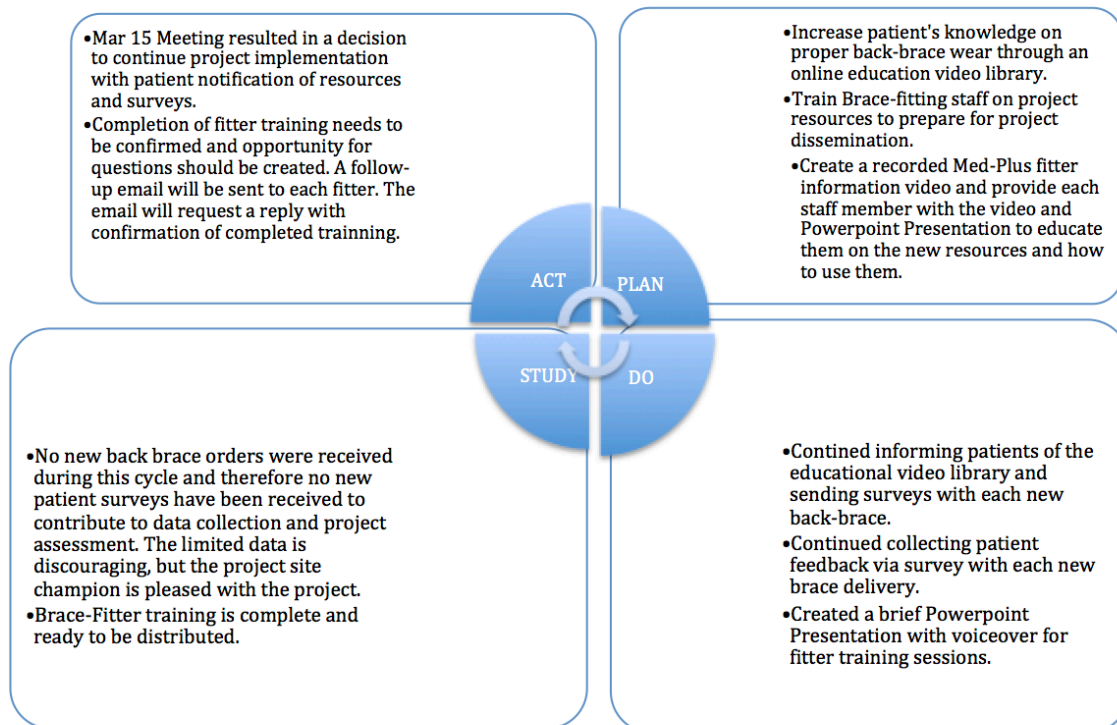
PDSA Cycle #1 (February 1 - 15, 2021)



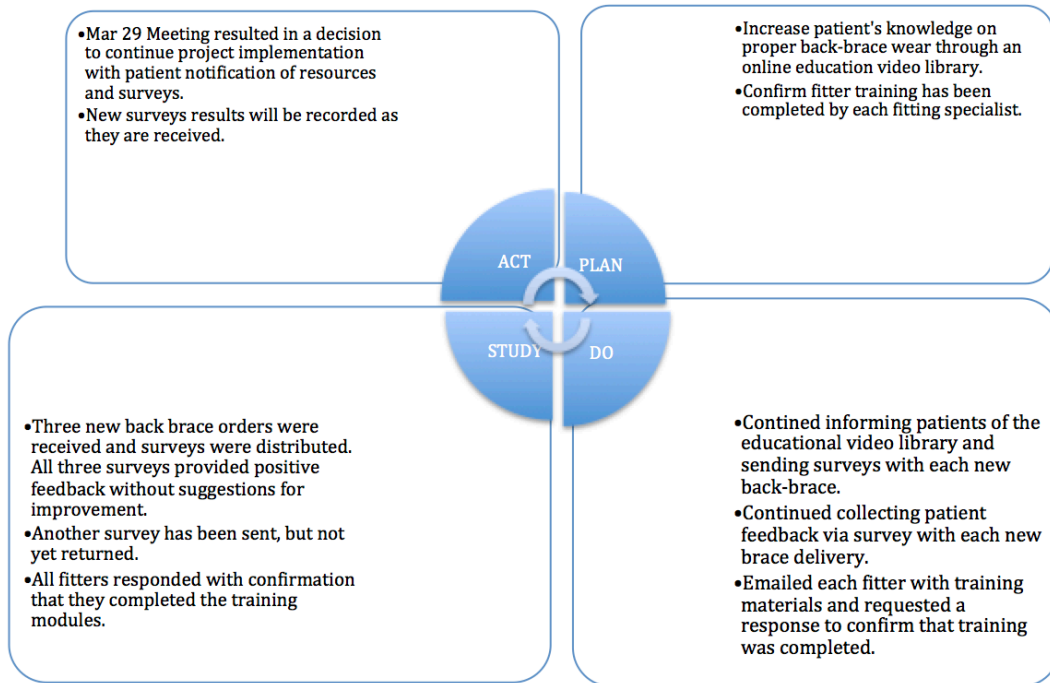
PDSA Cycle #2 (Feb 16 – March 1, 2021)



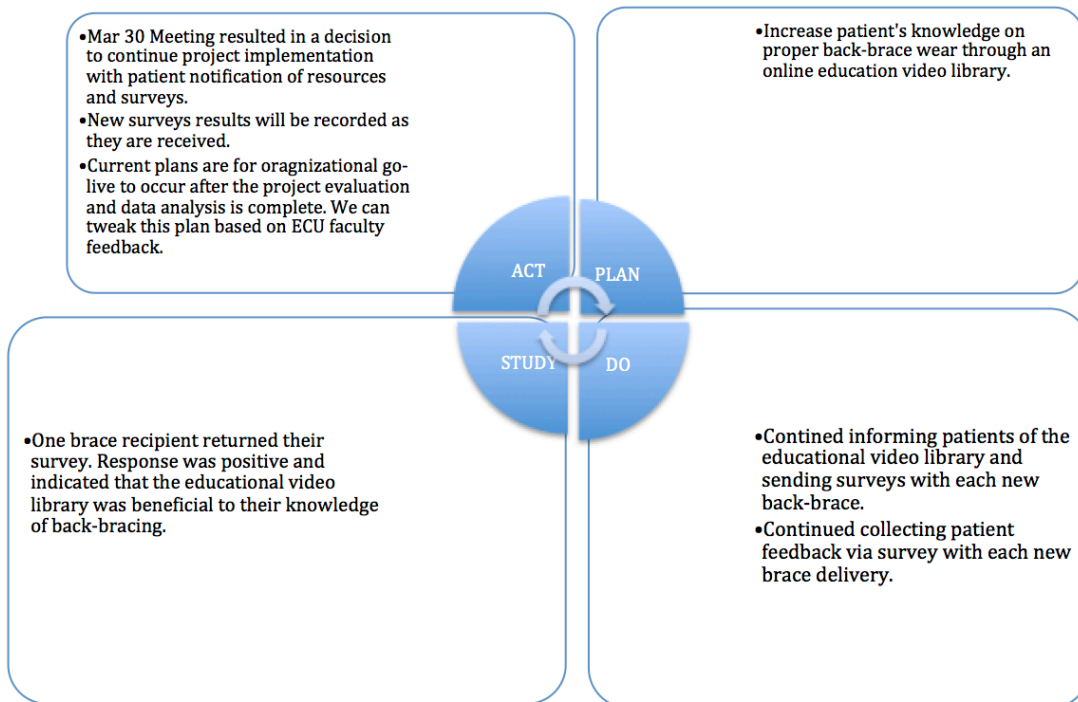
PDSA Cycle #3 (March 2-March 15)



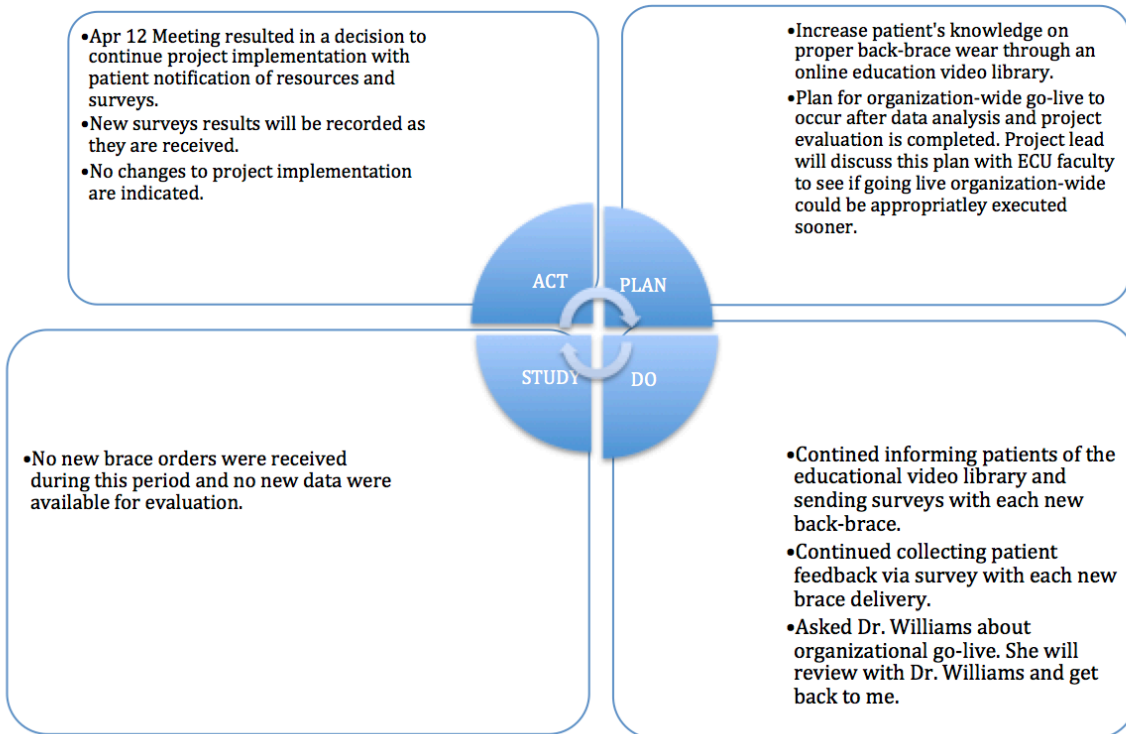
PDSA Cycle #4 (March 16-29)



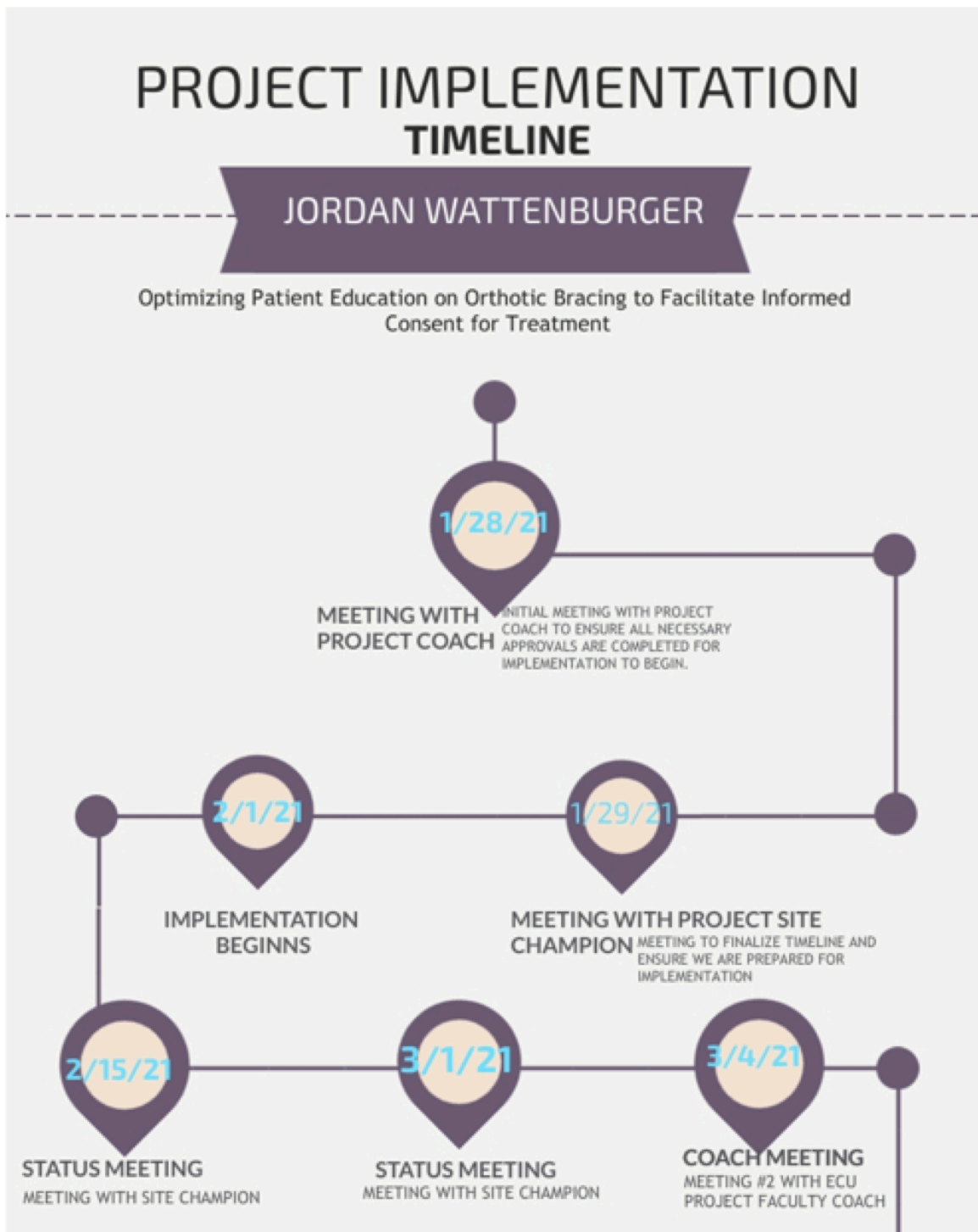
PDSA Cycle #5 (March 30-Apr 12)

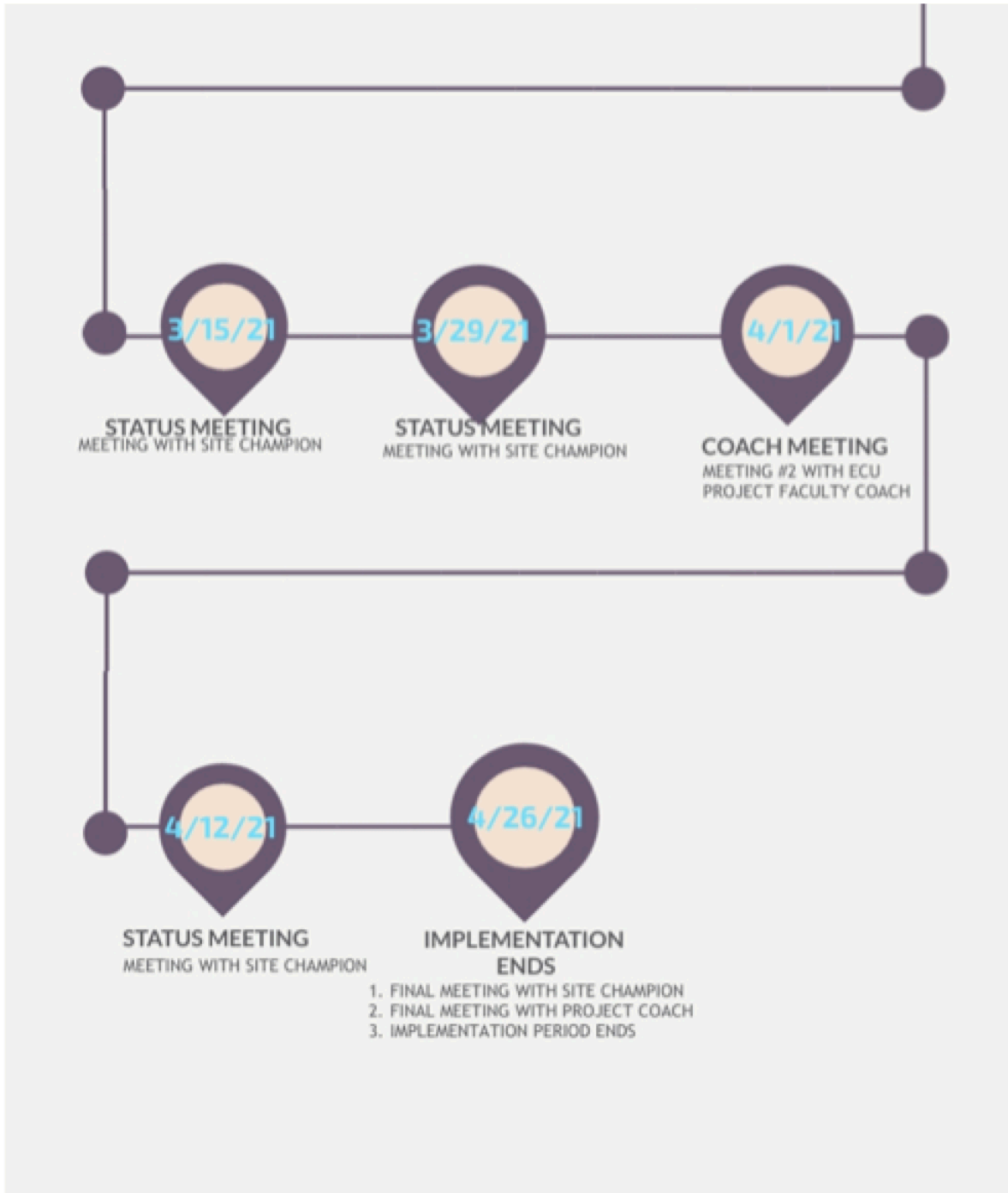


PDSA Cycle #6 (Apr 13-Apr 26)



Appendix H Project Timeline




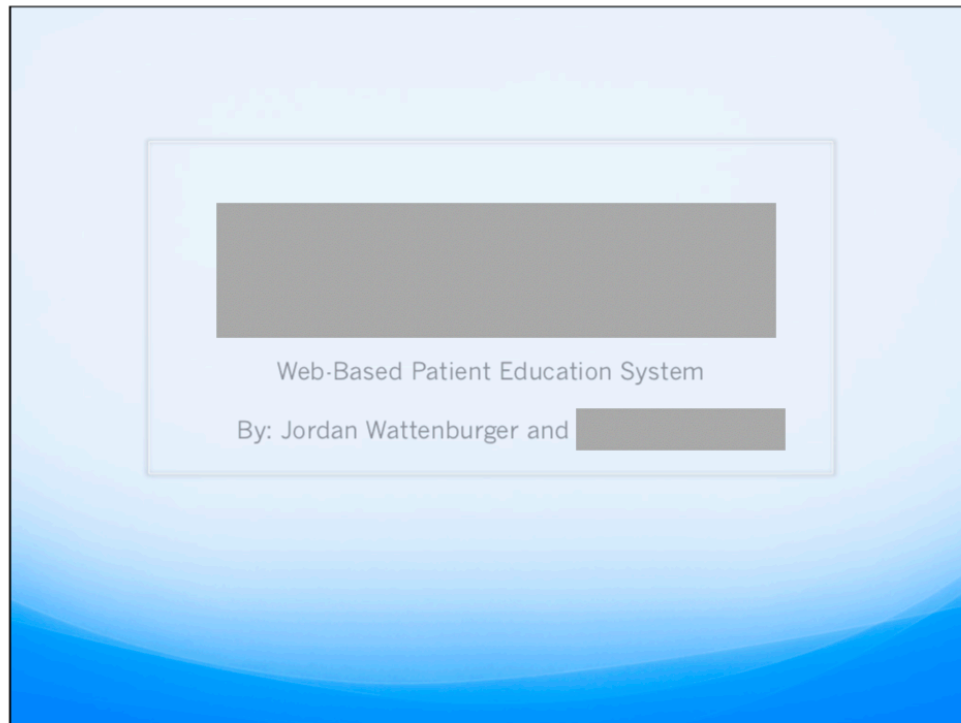


Appendix I
Budget

| <u>Line Item</u> | <u>Unit Cost</u> | <u>Quantity</u> | <u>Total</u> |
|---------------------------------------|-------------------------|------------------------|---------------------|
| 1-Year DocuSign Membership | \$120.00 | 1 | \$120.00 |
| 1-year Domain and Website Hosting Fee | \$123.15 | 1 | \$123.15 |
| | | | \$243.15 |

Appendix J

Brace-Fitting Specialist Training Presentation




PANDEMIC

- The Coronavirus pandemic has severely limited our in-person interactions with patients.
- The pandemic has created a barrier to patient education.
- Brace refusals and returns have become more frequent since the COVID-19 pandemic began.
- Patient education is key in successful bracing.
- Informed consent requires appropriate and thorough patient education.



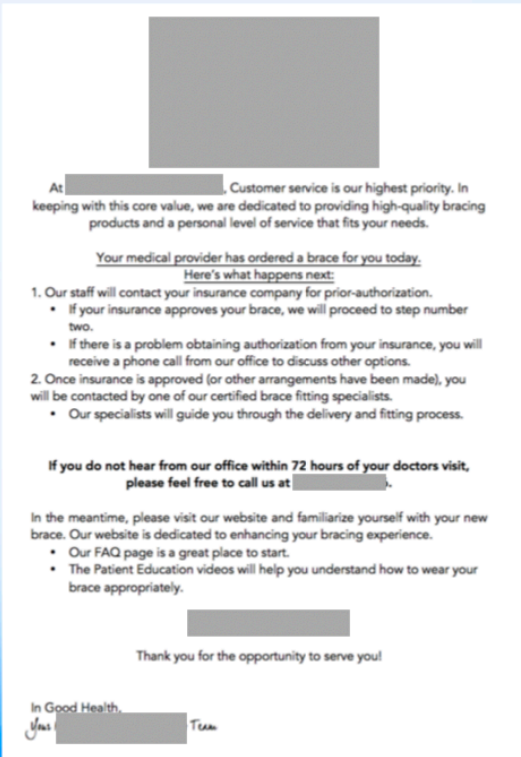
Web-Based Patient Education System


- Proper utilization of a web-based patient education system will increase our ability to provide appropriate patient education.

Presenting the Website to Patients



- Partnering providers will give this flyer to the patient when a new brace order is placed.
- The flyer provides contact information, timeline, and web address.
 - Patients are encouraged to visit the website and view the educational videos while they wait to hear from our fitters.





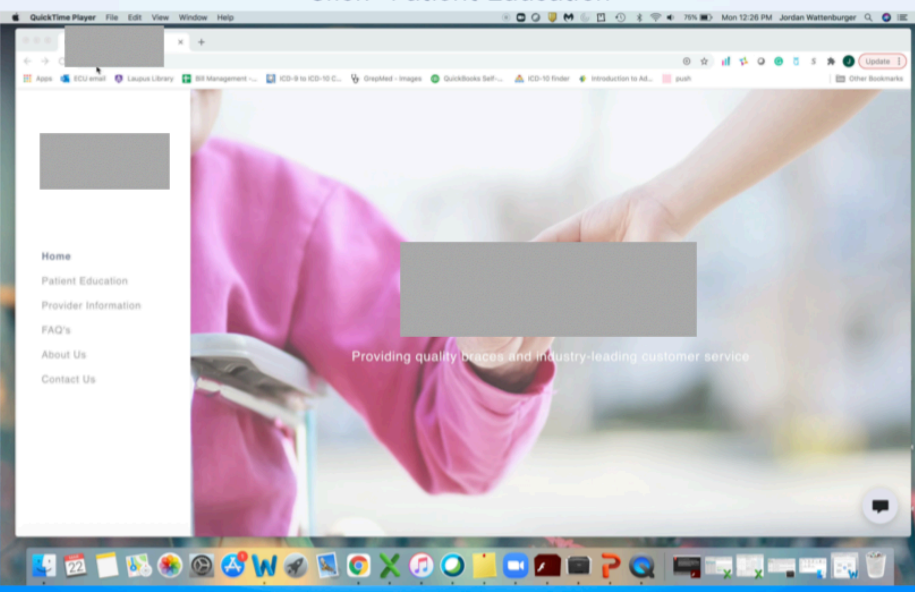
Initial Contact

- When a fitter contacts a patient to set up delivery, the fitter will reinforce the benefit of visiting the website and viewing the educational videos.
- Remind the patient about the website and encourage them to view the educational videos.



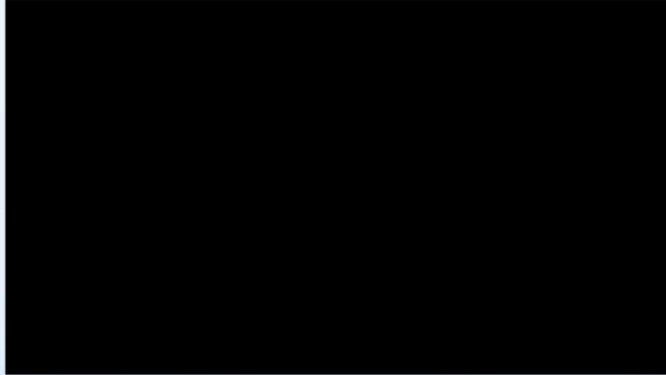
Accessing the videos

- [Redacted]
- Click "Patient Education"

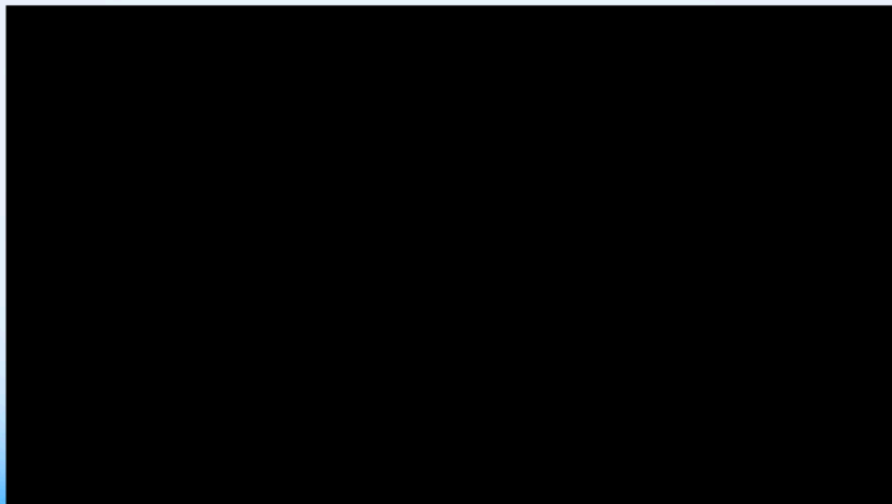


Video Content

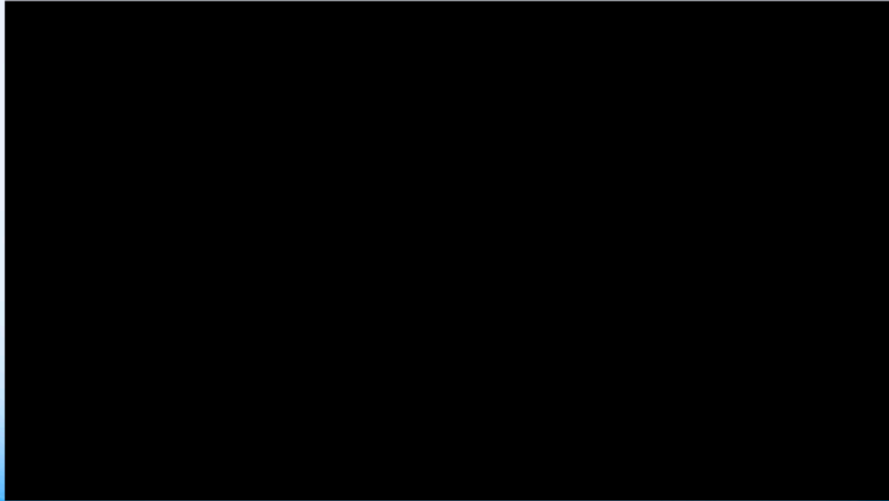
- There are 3 educational videos:
- Unboxing Your Brace (COVID-19)
- Wearing and Adjusting Your Back Brace
- Wearing Your Knee Brace



Wearing And Adjusting Your Back Brace



Wearing Your Knee Brace



Filling A Gap

The Website and Videos are a Tool

- We are still accountable for patient education.
- Encourage the patient to call you if they have questions.
- Viewing the videos prior to brace delivery helps the patient know what to expect.

Follow Up with The Patient

- Call the patient about a week after brace delivery.
- Remind the patient that the website and videos are continually available to them even after delivery.

Questions or Suggestions for Improvement



- The Website and Educational Video Library were created as part of a Quality Improvement Initiative.
- If you have questions or suggestions for improvement, please contact

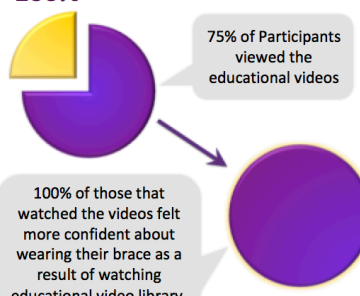
[Redacted contact information]

- [Redacted text]

- [Redacted text]

Appendix K DNP Project Poster

Improving Patient Education on Orthotic Back Bracing

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| <p style="text-align: center; background-color: #4a4a8a; color: white; padding: 2px;">PROBLEM</p> <ul style="list-style-type: none"> ✦ The COVID-19 Pandemic prompted the partnering organization to end in-person delivery of new back-braces ✦ Patient education was limited to telephone communication and manufacturer’s instructions ✦ The organization did not have a website or video library to supplement patient education | <p style="text-align: center; background-color: #4a4a8a; color: white; padding: 2px;">RESULTS</p> <p>8 New brace orders were received during the implementation period</p> <p>100% All participants returned their survey</p> <div style="text-align: center;">  </div> | <p style="text-align: center; background-color: #4a4a8a; color: white; padding: 2px;">BARRIERS</p> <ul style="list-style-type: none"> ✦ COVID-19 limited the number of new brace orders and ultimately the sample size for the project ✦ One patient lacked internet access and was not able to view the website or video library |
| <p style="text-align: center; background-color: #4a4a8a; color: white; padding: 2px;">PURPOSE</p> <ul style="list-style-type: none"> ✦ To optimize patient education methods within the partnering organization to increase patient knowledge of proper back-brace wear and potential benefits of brace wearing | <p style="text-align: center; background-color: #4a4a8a; color: white; padding: 2px;">SECONDARY BENEFITS</p> <ul style="list-style-type: none"> ☑ New website met criteria for Healthy People 2020 goal HC/HIT-8.1 ☑ Improved communication with patients | <p style="text-align: center; background-color: #4a4a8a; color: white; padding: 2px;">IMPLICATIONS</p> <ul style="list-style-type: none"> ✦ Web-based patient education tools are beneficial, particularly when traditional patient education is limited ✦ The concept of web-based patient education could translate to other realms of healthcare ✦ Web-based patient education offers ongoing education for reinforcement of important concepts |
| <p style="text-align: center; background-color: #4a4a8a; color: white; padding: 2px;">METHODOLOGY</p> <ul style="list-style-type: none"> ✦ Created an organizational website and patient education video library ✦ NC Brace-Fitting Specialist instructed all new patients to visit the website and view the educational videos ✦ Survey sent to all participants to evaluate the impact of the project intervention ✦ Planned Change Model guided project development; PDSA methodology guided implementation | <p style="text-align: center; background-color: #4a4a8a; color: white; padding: 2px;">SUSTAINABILITY</p> <ul style="list-style-type: none"> ✦ All staff received training on project intervention and how to incorporate the web-based education into practice ✦ All costs of project continuation were transferred to the organization ✦ The Partnering organization has already expanded the intervention to the entirety of the company ✦ A staff member has assumed responsibility for website and video portal maintenance | |



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Appendix L

Doctor of Nursing Practice Essentials

| Essentials | Competency/Description | Demonstration of Knowledge |
|---------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Essential I <i>Scientific Underpinning for Practice</i> | <p>Competency – Analyzes and uses information to develop practice</p> <p>Competency -Integrates knowledge from humanities and science into context of nursing</p> <p>Competency -Translates research to improve practice</p> <p>Competency -Integrates research, theory, and practice to develop new approaches toward improved practice and outcomes</p> | <p>Conducted a literature review to develop a quality improvement project to increase patient education on orthotic bracing.</p> <p>Utilized evidence-based methods to developed a web-based educational program that included a video library that was easily accessible to patients. The videos included subtitles to facilitate widespread understanding of video content.</p> <p>Utilized the Planned Change Model to guide project development, implementation, and dissemination.</p> |
| Essential II <i>Organizational & Systems Leadership for Quality Improvement & Systems Thinking</i> | <p>Competency –Develops and evaluates practice based on science and integrates policy and humanities</p> <p>Competency –Assumes and ensures accountability for quality care and patient safety</p> <p>Competency -Demonstrates critical and reflective thinking</p> <p>Competency -Advocates for improved quality, access, and cost of health care; monitors costs and budgets</p> <p>Competency -Develops and implements innovations incorporating principles of change</p> <p>Competency - Effectively communicates practice knowledge in writing and orally to improve quality</p> <p>Competency - Develops and evaluates strategies to manage ethical dilemmas in patient care and within health care delivery systems</p> | <p>Developed a new program where one did not exist.</p> <p>Conducted bi-weekly meetings with members of the project team to assess for potential improvements to the project.</p> <p>Tracked project progress using the PDSA methodology.</p> <p>Analyzed patient feedback to assess project progress and success, and to monitor for potential concerns or areas needing improvement.</p> <p>Developed a poster to summarize the project intervention and outcomes. Conducted an oral presentation about the project for the faculty and colleagues at the University.</p> |

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| <p>Essential III <i>Clinical Scholarship & Analytical Methods for Evidence-Based Practice</i></p> | <p>Competency - Critically analyzes literature to determine best practices Competency - Implements evaluation processes to measure process and patient outcomes Competency - Designs and implements quality improvement strategies to promote safety, efficiency, and equitable quality care for patients Competency - Applies knowledge to develop practice guidelines Competency - Uses informatics to identify, analyze, and predict best practice and patient outcomes Competency - Collaborate in research and disseminate findings</p> | <p>Performed an extensive literature review to determine the utility of a web-based education system in healthcare.</p> <p>Created a survey to evaluate the impact of the project intervention.</p> <p>Published and presented findings to the faculty and DNP students at ECU.</p> |
| <p>Essential IV <i>Information Systems – Technology & Patient Care Technology for the Improvement & Transformation of Health Care</i></p> | <p>Competency - Design/select and utilize software to analyze practice and consumer information systems that can improve the delivery & quality of care Competency - Analyze and operationalize patient care technologies Competency - Evaluate technology regarding ethics, efficiency and accuracy Competency - Evaluates systems of care using health information technologies</p> | <p>Created a website and web-based patient education portal for the partnering organization. Developed a flyer to inform patients about the new resources. The organizational website met the criteria from Healthy People 2020’s objective HC/HIT-8.1.</p> <p>Analyzed survey results to evaluate for gaps in the project intervention.</p> <p>Tracked survey results using an Excel spreadsheet. Communicated survey results with the Project Site Champion during bi-weekly meetings.</p> |

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| <p>Essential V <i>Health Care Policy of Advocacy in Health Care</i></p> | <p>Competency- Analyzes health policy from the perspective of patients, nursing and other stakeholders Competency – Provides leadership in developing and implementing health policy Competency –Influences policymakers, formally and informally, in local and global settings Competency – Educates stakeholders regarding policy Competency – Advocates for nursing within the policy arena Competency- Participates in policy agendas that assist with finance, regulation and health care delivery Competency – Advocates for equitable and ethical health care</p> | <p>Collaborated with executives from the partnering organization during project development, implementation, and evaluation.</p> <p>Created and disseminated training materials to employees of the partnering organization. These materials assisted with dissemination of the project intervention throughout the partnering organization.</p> |
| <p>Essential VI <i>Interprofessional Collaboration for Improving Patient & Population Health Outcomes</i></p> | <p>Competency- Uses effective collaboration and communication to develop and implement practice, policy, standards of care, and scholarship Competency – Provide leadership to interprofessional care teams Competency – Consult intraprofessionally and interprofessionally to develop systems of care in complex settings</p> | <p>Utilized the PDSA methodology to guide bi-weekly meetings with Project Site Champion.</p> <p>Conducted periodic meetings with ECU project faculty regarding project status.</p> <p>Adapted recommendations from a study performed in a surgical clinic to suit the project population.</p> |

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| <p>Essential VII <i>Clinical Prevention & Population Health for Improving the Nation's Health</i></p> | <p>Competency- Integrates epidemiology, biostatistics, and data to facilitate individual and population health care delivery Competency – Synthesizes information & cultural competency to develop & use health promotion/disease prevention strategies to address gaps in care Competency – Evaluates and implements change strategies of models of health care delivery to improve quality and address diversity</p> | <p>Evaluated current statistics on chronic pain in the United States.</p> <p>Collaborated with Project Site Champion to identify a gap in care. Brainstormed with him on how to fill this gap using evidence-based modalities.</p> <p>Implemented a program to increase patient education during a pandemic when in-person education was not possible.</p> |
| <p>Essential VIII <i>Advanced Nursing Practice</i></p> | <p>Competency- Melds diversity & cultural sensitivity to conduct systematic assessment of health parameters in varied settings Competency – Design, implement & evaluate nursing interventions to promote quality Competency – Develop & maintain patient relationships Competency –Demonstrate advanced clinical judgment and systematic thoughts to improve patient outcomes Competency – Mentor and support fellow nurses Competency- Provide support for individuals and systems experiencing change and transitions Competency –Use systems analysis to evaluate practice efficiency, care delivery, fiscal responsibility, ethical responsibility, and quality outcomes measures</p> | <p>Identified potential disparities involving lack of access to the project intervention. Made recommendations for patients to access the intervention through a public computer.</p> <p>Participated in two rounds of peer-evaluation of the project. Provided feedback for a colleague on a different DNP project.</p> <p>Supported the partnering organization throughout the implementation period by maintaining appropriate communication, relaying results, and educating the organization's employees.</p> <p>Maintained a project budget and ensured costs of sustaining the project were transferred to the partnering organization.</p> |