A Quality Improvement Project for Post-COVID-19 Patients through Reminder Phone Calls

Danielle Sweeney and Abrielle Wildman

Michigan State University

College of Nursing

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Acknowledgements

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Abstract

Background and Review of Literature: COVID-19 is a devastating illness that has detrimental health, financial and emotional consequences. Healthcare providers are utilizing questionnaires such as the PROMIS-29 form to help guide management of long term symptoms. Calling patients prior to their appointment as a reminder to complete their forms has proven to increase patient compliance with form completion.

Purpose: The purpose of this quality improvement project was to increase the PROMIS-29 form response rate prior to the COVID-19 recovery care appointment, in hopes of improving care for patients living with post-COVID-19 conditions.

Methods: This project was implemented at a large Midwest healthcare organization's primary care clinics. The Doctor of Nursing Practice (DNP) students called patients within 72 hours prior to their appointment, to remind them to complete the PROMIS-29 form on their MyChart portal.

Implementation Plan/Procedure: The DNP students completed HIPAA training and utilized a script provided by the large Midwest healthcare organization when calling patients. A weekly report was provided by the community partner that includes a list of patients who needed to be called, according to the "post COVID follow up" visit type. The DNP students traveled to the large Midwest healthcare organization's administration building to conduct phone calls. Pre-intervention and post-intervention surveys were sent to the providers to determine the success of the intervention.

Implications/Conclusion: Various project limitations impeded the ability to determine the success of the intervention however, the project proved helpful in determining that other reminder modalities may be of benefit to explore in the future.

   Keywords*:* Patient, Remind, Phone, Text, Email, Call, Form, Paperwork

A Quality Improvement Project for Post-COVID-19 Patients through Reminder Phone Calls

Coronavirus 2019 (COVID-19) is a devastating disease that was first discovered in December 2019, and continues to affect millions of people worldwide (Centers for Disease Control and Prevention [CDC], 2021a; CDC, 2022). The people of the United States (U.S.) have been severely burdened by this disease with over 80 million diagnosed, with Michigan ranking tenth highest in the country (CDC, 2022). The metro Detroit area accounts for the majority of Michigan's COVID-19 cases (Suleyman et al., 2020). There is an increase in patients experiencing symptoms of COVID-19 for months after initial diagnosis (Greenhalgh, Knight, A'Court, Buxton, & Husain, 2020). These are considered long term effects of COVID-19 (Greenhalgh et al., 2020). Treatment for these patients can be difficult for providers to manage due to extensive and diverse symptoms (Greenhalgh et al., 2020). Healthcare providers are utilizing symptom assessment forms to help navigate and provide care for patients experiencing the long term effects of COVID-19. Increasing the utilization of these symptom assessment forms is beneficial for improving the care of patients suffering from post-COVID-19 symptoms.

Background and Significance

COVID-19 is a contagious respiratory illness caused by the virus, SAR-CoV-2 (CDC, 2021a). The first case emerged in China, December 2019 (CDC, 2021a). Not long after, the first U.S. case was discovered in the State of Washington in January 2020 (CDC, 2020). At the time of this writing, there have been 492,189,439 total confirmed cases worldwide with 6,159,474 deaths (World Health Organization [WHO], 2022). There have been 80,066,744 confirmed cases of COVID-19 in the U.S. and 980,220 confirmed deaths (CDC, 2022).

Examining the COVID-19 pandemic on a local or state-wide scale, Michigan had the highest case fatality rate in the U.S. (Suleyman et al., 2020). More specifically, the city of Detroit

and surrounding counties accounted for 80% of COVID-19 cases and 86% of deaths due to

COVID-19 in the State of Michigan in 2020 (Suleyman et al., 2020).

A cross sectional study from Angulo, Finelli, and Swerdlow (2021) suggested a gross

underreporting of cases, increasing the potential long term effects of COVID-19 illness. COVID-

19 not only negatively impacts a patient's health in the acute phase of the disease but has the

potential to cause long term effects (Greenhalgh et al., 2020). About 10% of COVID-19 patients

experience symptoms such as cough, fatigue, shortness of breath and brain fog beyond three

weeks and some even suffer for months (Greenhalgh et al., 2020).

Health Disparities

As the rate of infection continues to rise in certain areas of the world and decrease in

others, it is certain that COVID-19 has undoubtedly contributed to health inequities on both a

global and local scale (Shadmi et al., 2020). This pandemic has disproportionately impacted

individuals of lower socioeconomic, migrant and minority status (Shadmi et al., 2020). This

population often has a history of chronic conditions, live in densely populated areas, experience

food insecurities, and have lower paying jobs (Shadmi et al., 2020). Additionally, the areas in

which these individuals work are often in the public sector, working in transportation or in

grocery stores (Shadmi et al., 2020). Those who have migrated to the U.S. may face cultural and

language barriers that pose a hurdle to understanding the preventative measures related to

COVID-19 (Shadmi et al., 2020). All of these factors place vulnerable populations at an

increased risk of contracting COVID-19 infection (Shadmi et al., 2020).

One study conducted at the a hospital in Detroit, examined the characteristics and

comorbidities of COVID-19 patients from March 9, 2020 until March 27, 2020 and found that

72.1% of COVID-19 patients were African American (Suleyman et al., 2020). These results are

particularly concerning considering African Americans make up 14% of Michigan's population, but still accounted for 32% of COVID-19 cases and 41% of deaths due to COVID-19 as of May 2020 (Suleyman et al., 2020). Social determinants of health that impact this population in Detroit include poverty, lack of health insurance coverage, and overcrowded housing which makes social distancing near impossible (Suleyman et al., 2020). Historically, a patient's comorbidities or genetics have been used to explain health inequities in minority populations (Burton, Bennett, & Burton, 2020). However, it is imperative we examine how systemic racism and social determinants of health lead to chronic stress and ultimately comorbid conditions that place patients at an increased risk of COVID-19 complications (Burton et al., 2020).

Long-Term Side Effects of COVID-19

Studies have shown that only 65% of COVID-19 patients have returned to their baseline health status 14-21 days after the diagnosis was confirmed (Greenhalgh et al., 2020). Various theories regarding why certain individuals are impacted more than others point to a weak antibody response, autoimmune conditions, and poor conditioning (Greenhalgh et al., 2020). It is equally concerning that providers may not yet know how best to manage this population or how to properly refer patients experiencing these symptoms (Greenhalgh et al., 2020). Unfortunately, evidence is limited and there is still much to learn regarding the long-term effects of COVID-19 (Greenhalgh et al., 2020).

Until long term studies are completed and more is known about the long-term effects of COVID-19, this condition will continuously be evaluated in the primary care setting (Greenhalgh et al., 2020). This will require interdisciplinary support, reliance on patient provider communication, managing comorbidities and the treatment of symptoms (Greenhalgh et al., 2020). With there being such a large variation in symptoms experienced by these patients post-

acute illness, it is clear that there is an increased need to assess their symptoms more frequently, to create an effective treatment plan (CDC, 2021b).

Symptom Assessment of Post-Acute COVID-19 Symptoms

As more patients are experiencing post-COVID-19 symptoms, providers have relied on tools such as the Patient Reported Outcomes Measurement Information System (PROMIS-29) form in order to assess patient symptoms and severity (see Appendix A for PROMIS-29 form). This form provides primary care providers information regarding the symptoms patients may be experiencing, mental or physical, while also providing information regarding the effect these symptoms have on patients' everyday lives (Hays, Spritzer, Schalet, & Cella, 2018).

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Problem Statement/Clinical Question

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With the discovery of individuals experiencing post-COVID-19 conditions, there is an increased need for care of this population in the primary care setting. Patients are experiencing a multitude of symptoms with varying severity (CDC, 2021c). One form of assessment that can be better utilized by patients and providers for the evaluation of symptoms, treatment, and the progression of illness is the PROMIS-29 form (Hays et al., 2018). Using the PROMIS-29 form to assess the impact of patient's symptoms is essential for providers in order to create a successful treatment plan and evaluate its impact (CDC, 2021b). The objective of this project is to focus on increasing patient provider communication, correctly assessing and managing post-COVID-19 symptoms, and ultimately improving quality of life. Increasing PROMIS-29 form adherence and utilization will help bridge the gap between an individuals' manifestations of post-COVID-19 symptoms and communication needed for providers to create a mutually agreed upon care plan, in the hopes of recovery.

Organizational Assessment "Gap" Analysis" of Project Site

The large Midwest healthcare organization launched their COVID-19 recovery care program in April, 2021 (R. Eis, personal communication, June 13, 2021). When the program was launched the PROMIS-29 form was selected as a way to accurately assess symptoms while encouraging patient participation for better symptom management. One problem that has been a barrier for the providers and patients is the inconsistent utilization of the PROMIS-29 form. A fishbone gap analysis showed that the main issue is a low response rate of form completion prior to the patient appointment. The gap analysis also showed a lack of knowledge regarding the form. Finally, the gap analysis showed that there is no standardized policy regarding reminding patients of completing this form or education on its importance (see Appendix B for fishbone diagram).

Improved response rates of completion of the PROMIS-29 form could likely benefit the COVID-19 recovery care program by improving patient-provider communications and care for patients suffering with long term symptoms of COVID-19. A standardized approach regarding the implementation of interventions to ensure patient completion and auditing of the PROMIS-29 form would improve response rates at the large Midwest healthcare organization.

Purpose of the Project

The purpose of this quality improvement project was to increase the response rate at which adult patients complete the PROMIS-29 form prior to their large Midwest healthcare organization COVID-19 recovery care appointment. This was accomplished through an evidenced based reminder modality such as calling patients prior to their appointment. Pre-intervention and post-intervention provider surveys responses were reviewed after the implementation phase. This intervention would allow providers time to review the patient's

results prior to their appointment, thus creating an effective treatment plan and reducing time

associated costs. Ultimately, the aim of this project was to improve care for patients suffering

from post-COVID-19 conditions in the primary care setting.

Evidence Based Practice Model/QI Model

Plan-Do-Study-Act

The Plan-Do-Study-Act (PDSA) model created by the Institute for Healthcare

Improvement (IHI) is a tool that can be utilized to test an intervention for change (Institute for

Healthcare Improvement [IHI], 2021). The PDSA model is a vital component of quality

improvement projects, as it can be used to determine how much change can be expected from the

intervention, if the intervention will work in the environment it is designed for, and to evaluate

the impact of the change (IHI, 2021). PDSA cycles should be continuously monitored and

adjusted as needed, until the change is implemented on a larger scale (IHI, 2021).

The PDSA model was utilized to guide this DNP project (see Appendix C for PDSA

diagram). The components of the PDSA cycle provided the DNP students with the steps required

to plan, implement and evaluate an intervention for post-COVID-19 patients. For the purposes of

this project, the PDSA steps were followed with the goal of increasing the percentage of patients

who fill out the PROMIS-29 form prior to their post-COVID-19 appointment. During the first

planning phase, DNP students met with the community partner, physicians, various stakeholders,

conducted a literature review and gathered demographic information about the patient

population. During the second step of the PDSA cycle, DNP students called patients to remind

them to fill out the PROMIS-29 form. The third step of this process involved assessing the

effectiveness of the intervention and evaluating the pre and post-intervention provider survey

responses. Finally, the fourth step involved discussing modifications to the intervention and

developing a sustainability plan for the future. The methods section provides a comprehensive

discussion regarding how the PDSA cycle was utilized to guide this project.

Review of the Literature

Search Strategy

A comprehensive literature search was conducted on June 24th, 2021 using the

Cumulative Index to Nursing and Allied Health Literature (CINAHL) database and the PubMed

database (see Appendix D for PRISMA diagram). A variety of search terms and combinations

were attempted before deciding on the most comprehensive search strategy. Search terms used

included "(patient) AND (remind*) AND (phone OR text OR email OR call) AND (form OR

paperwork)". This combination of search terms provided 68 results from CINAHL and 137

results from PubMed. After filtering the search for articles written between 2016 and 2021, there

were 37 from CINAHL and 77 from PubMed. After including only those articles written in

English, 76 articles remained from PubMed and 37 remained from CINAHL. Of the combined

113 articles from both databases, 18 duplicates were removed, with 95 articles remaining. Of

those 95 articles, 32 remained after reading through the title and abstract for appropriateness.

Each article was read in its entirety to determine whether it would be applicable to the project.

Eight articles then remained to be included and considered for the development of the

intervention (see Appendix E for literature table).

Inclusion criteria included those articles written between the years 2016 and 2021,

written in English. Studies performed in all countries regardless of origin were also included.

The search strategy included all levels of evidence including single qualitative studies up to

systematic reviews and meta-analysis. Exclusion criteria included pediatric studies or those that

focused primarily on female or male populations only.

There was extremely limited literature regarding patient reminders and the PROMIS-29 form. Therefore, the literature search was focused on the impact of various patient reminder modalities to improve patient adherence to treatment plans, medication regimens and form completion. It is reasonable to infer that if a reminder strategy improved patient compliance with treatment adherence, then it can be used to increase the completion of the PROMIS-29 form by post-COVID-19 patients prior to their appointment. Following a full text review of the final eight articles, various themes were identified and synthesized into a table (see Appendix F for themes table). Those themes include the use of text message, email, phone call, and mailed letters as a reminder for patients, either alone or in combination with one another.

Interventions

Text message.

Four of the articles (Amankwaa, Boateng, Quansah, Akuoko, & Evans, 2018; Brandzel et al., 2017; Coronado et al., 2018; Robotham, Satkunanathan, Reynolds, Stahl, & Wykes, 2016) utilized text messaging as an intervention to improve patient adherence and participation in their plan of care. Amankwaa et al. (2018) and Robotham et al. (2016) both evaluated the use of text messages as the sole intervention, while Coronada et al. (2018) and Brandzel et al. (2017) used text messages in combination with other interventions. Amankwaa et al. (2018) evaluated the use of mobile phone technologies in order to improve antiretroviral therapy (ART) adherence. The results of the study concluded scheduled text messages improved ART compliance among 18 years or older individuals who are human immunodeficiency virus (HIV) positive. The study concluded that mobile voice calls and triggered text messages did not represent a significant increase in adherence (Amankwaa et al., 2018). Similarly, Robotham et al. (2016) evaluated the use of text message reminders and patient appointment attendance. The study concluded adult

patients who received reminder text messages are 23% more likely to attend their clinic appointments compared to patients who did not and were 25% less likely to miss appointments (Robotham et al., 2016).

In contrast to the other studies, Coronado et al. (2018) evaluated the use of text messages in addition to email, phone call and mailed letters as interventions to improve patience compliance with fecal immunochemical testing (FIT). The study concluded 10% of patients who received a mailed letter returned their FIT sample within three weeks, 25.5% of the remaining patients returned the FIT after receiving a reminder. The reminder type varied and included a patient portal email reminder, automated phone call, live phone call, text message or a combination of a reminder letter with live call, automated and live call, and text message with live call (Coronado et al., 2018). Results revealed that live calls had better results when compared with written communication such as a letter or text (Coronado et al., 2018).

There are several gaps in the literature identified within these articles. Although it was concluded that text messaging can be successful in improving patient adherence and participation, in articles Robotham et al. (2016) and Amankwaa et al. (2018), the frequency and quantity of messages is still uncertain. Robotham et al. (2016) concluded multiple text notifications increased the rate of patients attending appointments but did not decrease the number of missed appointments. Amankwaa et al. (2018) had differing results regarding text messaging frequency and quantity. Lastly, Coronado et al. (2018) identified a barrier to the text message intervention being that there is no way to ensure patients are receiving their reminders in text message form.

Email.

The use of email as a method of patient reminder was assessed by three of the articles

(Pugh et al., 2021; Brandzel et al., 2017; Triplet et al., 2017). Pugh et al. (2021) and Triplet et al.

(2017) both examined email exclusively while Brandzel et al. (2017) used email in conjunction

with other interventions. Pugh et al. (2021) and Triplet et al. (2017) both evaluated the use of

automated email reminders and its effect on completion and submission of patient-reported

outcome measures (PROMs) forms and patient survey questionnaires. Both studies found that

submissions of these forms and questionnaires were improved with automated email reminders

when compared to those without. For example, Pugh et al. (2021) concluded that the PROMs

form completion rate was 59.2% in one month after receiving email reminders compared to a

31.3% completion rate for those without reminders. Similarly, Triplet et al. (2017) found a

25.8% increase in survey completion rates for those patients who received email reminders. Each

study discussed that this form of intervention allowed flexibility for patients to complete the

forms on their own time, outside of the clinic, which is predicted to have a positive influence on

the results.

Phone call.

Using telephone calls as a patient reminder modality was emphasized in five of the

articles (Amankwaa et al., 2018; Brandzel et al., 2017; Coronado et al., 2018; Ivers et al., 2020;

Zangalli et al., 2016). An identified gap in the literature exists in the fact that the phone call

intervention was never studied independently. In each of the five articles, phone calls were used

in combination with other reminders such as text message, email, or a mailed letter (Amankwaa

et al., 2018; Brandzel et al., 2017; Coronado et al., 2018; Ivers et al., 2020; Zangalli et al., 2016).

Four of the five studies were quantitative in nature and focused on a combination reminder

intervention (Amankwaa et al., 2018; Coronado et al., 2018; Ivers et al., 2020; Zangalli et al., 2016).

In contrast to the other four studies mentioned, Brandzel et al. (2017) conducted a qualitative focus group study which examined patient preference regarding cancer screening reminders. Patient responses were coded to determine which reminder modality was preferred (Brandzel et al., 2017). Most younger patients preferred text message or email reminders whereas older adults preferred a phone call to allow time for questions and to schedule an appointment (Brandzel et al., 2017). While this study may be a lower level of evidence, it is important to consider the utilization of phone call reminders in the older adult population (Brandzel et al., 2017). Brandzel et al. (2017) also found that patients preferred personalized reminders less than three months before the screening date. While Brandzel et al. (2017) recognized the impact age has on patient preference, the effect that this may have on the results is unknown, thus creating a gap in the literature.

Mailed letter.

Patient reminders in the form of mailed letters were studied in three articles (Coronado et al., 2018; Ivers et al., 2020; Zangalli et al., 2016). None of the studies included in this literature search examined using mailed letters as the only intervention, indicating a gap in the literature. More specifically, mailed letters were always used in combination with other reminders such as text message or phone call, making it difficult to discern if this intervention would be helpful independently. For example, Ivers et al. (2020) and Zangalli et al. (2016) both examined how the combination of phone calls and mailed letters as reminders, impacts adherence to treatment plans. Ivers et al. (2020) concluded that 37% of patients in the intervention group completed cardiac rehabilitation compared to the control group, of which only 27% completed the

rehabilitation. These findings reflect those found in the Zangalli et al. (2016) article, which discovered the combination of reminder phone calls and mailed letters increased diabetic eye exam appointment attendance by 58%. In contrast to these two studies, Coronado et al. (2018) examined the use of mailed letters, phone calls and email reminders to improve FIT compliance.

Summary

Overall, this literature review illustrated that various reminder modalities can be effective at increasing patient compliance (Amankwaa et al., 2018; Brandzel et al., 2017; Coronado et al., 2018; Ivers et al., 2020; Pugh et al., 2021; Robotham et al., 2016; Triplet et al., 2017; Zangalli et al., 2016). Although various interventions were studied, either alone or in combination with others, it is evident that the utilization of phone calls and text messages are the most effective interventions (Amankwaa et al., 2018; Brandzel et al., 2017; Coronado et al., 2018; Ivers et al., 2020; Robotham et al., 2016; Zangalli et al., 2016). Robotham et al. (2016) and Amankwaa et al. (2018) were the only two level I studies included in this literature review and both demonstrated that text messaging was beneficial with improving patient adherence. Phone calls were also utilized in the majority of the studies and demonstrated a positive impact as reminder modalities (Amankwaa et al., 2018; Brandzel et al., 2017; Coronado et al., 2018; Ivers et al., 2020; Zangalli et al., 2016). However, unlike text messaging which proved to be successful as a single intervention by Robotham et al. (2016), phone calls were often studied as combination reminder strategies (Amankwaa et al., 2018; Brandzel et al., 2017; Coronado et al., 2018; Ivers et al., 2020; Zangalli et al., 2016).

For these reasons, it is evident that current evidence supports reminder strategies such as text messages or phone calls as effective patient reminders (Amankwaa et al., 2018; Brandzel et al., 2017; Coronado et al., 2018; Ivers et al., 2020; Robotham et al., 2016; Zangalli et al., 2016).

Due to the lack of evidence specifically regarding the use of reminders and completion of the PROMIS-29 form, the literature search was expanded to include the use of reminders for various patient situations. Both text message and phone call reminders have proven to be effective across different patient populations and outcome measures (Amankwaa et al., 2018; Brandzel et al., 2017; Coronado et al., 2018; Ivers et al., 2020; Robotham et al., 2016; Zangalli et al., 2016). Therefore, it is reasonable to conclude that phone call reminders could also improve the PROMIS-29 form response rate in post-COVID-19 patients.

Goals, Objectives, and Expected Outcomes

It was evident after discussing with the community partner, that a need exists for providing care to post-COVID-19 patients. One way to accomplish this is through the use of the PROMIS-29 form. If this form could be completed prior to the patient's visit, it could be reviewed by the provider before the appointment and improve visit times. Through anecdotal data, via discussions with the lead physician of the COVID-19 recovery care program it was evident that essentially no patients were completing the PROMIS-29 form before their appointment. For this reason, the primary outcome of this project was to increase the patient's compliance with completing the form prior to their appointment. A secondary outcome was to improve provider efficiency when caring for these patients. In order to determine if the outcomes were met, data was collected using pre-intervention and post-intervention surveys. The following Specific, Measurable, Assignable, Realistic and Time specific (SMART) goals were developed in order to achieve the expected outcomes.

1. Increase the percentage of patients who fill out the PROMIS-29 form prior to their appointment from 0% to 30% by the end of December 2021.

2. DNP students called patients within 72 hours prior to their appointment as a reminder between November 2021-December 2021.

3. Improve provider efficiency as evidenced by comparing the provider's pre-intervention survey responses to post-intervention survey responses by the end of December 2021.

4. Present the large Midwest healthcare organization with the quality improvement (QI) project results and sustainability plan by May 2022, with the goal of using this information to guide the large Midwest healthcare organization in developing a reminder policy in the future.

Methods

Project Site and Population

The large Midwest healthcare organization's COVID-19 recovery care program launched in April 2021. (R. Eis, personal communication, June 13, 2021) This program implemented in the primary care setting, focuses on the physical and emotional health of patients experiencing the long term effects of COVID-19 infection (R. Eis, personal communication, June 13, 2021). Its foundation aligns with the large Midwest healthcare organization's mission statement of improving lives through science and the art of healing (Henry Ford Health System, 2021). The population being served by this program are adult patients, 18 years and older who have been diagnosed with COVID-19 and are suffering from long term effects of the virus (R. Eis, personal communication, June 13, 2021). Long term effects are considered continued symptoms including but not limited to dyspnea, brain fog, and fatigue for more than 12 weeks from the initial COVID-19 diagnosis, that cannot be attributed to an alternative diagnosis (R. Eis, personal communication, June 13, 2021).

The purpose of the COVID-19 recovery care program is to assist primary care providers (PCP) with the management of long term COVID-19 symptoms (R. Eis, personal communication, June 13, 2021). The large Midwest healthcare organization has a variety of specialists available to help assist with managing patient care and are listed below.

- Physical therapy

- Occupational therapy

- Rehabilitation services

- Behavioral health

- Cardiology

- Neurology

- Neuropsychology

- Pulmonary

- Sleep disorders

- Social work

- Speech therapy

This program is being developed alongside our community partner who is a registered nurse, as well as a project manager for the large Midwest healthcare organization (R. Eis, personal communication, June 13, 2021). The program is also being managed by a lead physician for care design and innovation of the project (R. Eis, personal communication, June 13, 2021).

PROMIS-29 Form.

The PROMIS-29 forms are patient self-reporting measures, that are used to assess the various aspects of a patient's health including their mental health, physical health, and social determinants (Hays et al., 2018). The PROMIS-29 form is divided up into seven categories

which include physical function, anxiety, depression, fatigue, sleep disturbance, the ability to participate in social roles and activities, and pain (Hays et al., 2018; PROMIS Health Organization [PHO], 2018). There are four questions related to each category (Hays et al., 2018). Lastly, the patient is able to rate the intensity of their pain (Hays et al., 2018). According to Hays et al. (2018), the PROMIS-29 form can be used to evaluate the impact of treatment and track the progression of illness over time (see Appendix A for PROMIS-29 form).

The majority of patients are not completing the PROMIS-29 form prior to their visit, causing delays in care. This occurs because the provider must take time to review the 29 question form during the visit, thus taking up visit time that could be spent discussing the patient's symptoms and developing a plan of care. These validated forms can be used by the PCP to objectively measure the patient's symptoms and determine if they are progressing in their recovery. This was identified by our community partners as an area of opportunity to improve patient care outcomes (see Appendix G for SWOT analysis). Additionally, this is a new service that is still being fully developed and therefore, not all the Midwest healthcare organization's PCPs are aware of the appropriate visit type to use (see Appendix G for SWOT analysis). For this reason, there are some patients experiencing long term symptoms of COVID-19 and are not benefiting from this service.

Ethical Considerations/Protection of Human Subjects

Michigan State University (MSU) Internal Review Board (IRB) and the large Midwest healthcare organization's IRB approval was obtained prior to initiating the DNP project. The official IRB determination form was submitted upon proposal approval. The pre-intervention data regarding how many patients were using the COVID-19 recovery care services was de-identified, aggregated and not accessible to the DNP students. This information was only

accessible to the community partner. Informed consent was obtained from providers completing the pre-intervention and post-intervention surveys (see Appendix H for pre-intervention survey, see Appendix I for post-interventions survey).

This QI project was discussed with the large Midwest healthcare organization's Nursing Professional Development and Education Administrator who submitted a request for EPIC and email access. The DNP students met with the healthcare organization's Director, Deputy Information Privacy Officer who approved the project and allowed students to contact patients through phone calls. The scripts used to call patients were developed by and approved by the healthcare organization's Director, Deputy Information Privacy Officer (see Appendix J for voicemail script, see Appendix K for non-patient script, see Appendix L for patient script). This script included the sentence the DNP students read to obtain verbal consent from the patient at the beginning of the phone call. The DNP students completed the Health Insurance Portability and Accountability Act (HIPAA) training and followed the large Midwest healthcare organization's privacy policy. Access to large Midwest healthcare organization's electronic medical record (EPIC) was given to students. The community partner obtained a weekly report of all patients under the specific "post COVID follow up" visit type from the large Midwest healthcare organization's data analytics team. This report included patient's names, medical record numbers, the date of their visit, location of their visit and provider. This report was sent via the large Midwest healthcare organization' secure email to the DNP students to be utilized to call patients.

The patient information was accessed and phone calls were made at the large Midwest healthcare organization's administration building. The DNP students were trained on how to call patients, what information can be left on a voicemail and how to determine if the patient

authorized another person to discuss their protected health information. Patient information was not accessed using the DNP student's personal laptops and patient phone calls were not made from their personal phones. The excel spreadsheet used to gather data (see Appendix M for data excel spreadsheet) does not contain any patient identifying information and is stored on the student's personal laptop. The excel spreadsheet was reviewed with the large Midwest healthcare organization's Director Deputy Information Privacy Officer, who approved the use of the spreadsheet on the student's personal laptops. The DNP students followed the large Midwest healthcare organization's policies and upheld the standards of care.

Setting Facilitators and Barriers

This project's setting was within the large Midwest healthcare organization's outpatient primary care clinics. The population included adult patients, 18 years of age or older, with a history of COVID-19, who were experiencing long term effects of the virus and who were evaluated through the COVID-19 recovery service. The stakeholders involved in the implementation of the project included the lead physician of the COVID-19 recovery care program, the lead nurse and project manager of the COVID-19 recovery care program, information technology staff, the large Midwest healthcare organization's compliance officer, Nursing Professional Development and Education Administrator, Director of Access Technology and Experience, the Senior Marketing Specialist and Department of Public Health Sciences assistant scientist. Each stakeholder provided their own expertise and perspectives to the development of this project. They were all instrumental in supporting the DNP students throughout each stage of the project.

In order to better assess the strengths, weaknesses, opportunities, and threats (SWOT) of the project site, further analysis was conducted (see Appendix G for SWOT analysis). Barriers

that posed a threat to the success of the project were the utilization of the new COVID-19

recovery care service by providers, lack of staff, lack of physician survey responses, time

constraints of intervention and continuous evolution of the service.

The implementation of the COVID-19 recovery care program is very new and many

physicians were not aware of the service. Consequently, providers are still learning the workflow

of the service, and how to use the proper visit type, which resulted in a small patient population

to sample. Approximately 100 post-COVID-19 patients have been seen between April 2021 and

August 2021 (R. Eis, personal communication, August 9, 2021). The lead physician and project

manager are working to increase providers' knowledge of the service, with the aim of gradually

increasing the number of patients under this visit type.

A staffing shortage resulted in an increased workload of the medical assistants. For this

reason, the DNP students volunteered to implement the intervention themselves to avoid

increasing the staff's workload. The providers selected to complete the pre-intervention and post-

intervention surveys were those that were using the "post COVID follow-up" visit type at the

time of sending out the surveys. The physicians were given two weeks to respond with reminder

emails sent out due to lack of response. After two weeks, the DNP students received one pre-

intervention survey response. The lack of responses posed a barrier when the DNP students were

evaluating the effectiveness of the intervention, which is described further in the analysis

section.

The DNP students conducted patient phone call reminders once a week on Tuesdays,

within 72 hours of their scheduled appointment. Therefore, the patients whose appointments

were outside of the 72 hour window were missed. For example, all patients with appointments

scheduled on Mondays did not receive reminder phone calls.

Lastly, because the COVID-19 recovery care program is new to the large Midwest healthcare organization, it is continuously changing and evolving with time. For this reason, the services' needs were continuously changing. The DNP students created their project centered around communication with the lead physician and project manager allowing for mutual consensus on the intervention to be implemented. Despite these barriers, the DNP students were supported by the community partners within the large Midwest healthcare organization as evidenced by the agency agreement letter (see Appendix N for agency letter).

The Intervention and Data Collection Procedure

The following paragraphs explain the PDSA cycle in detail and provide an explanation of the project's timeline. A visual representation of the timeline is available in Appendix O.

Plan.

In preparation for implementing the intervention, the DNP students met with the community partner and lead physician of the COVID-19 recovery care program over zoom. During several meetings, the DNP students gathered information regarding the workflow process of the COVID-19 recovery care program and which patient population it serves. DNP students conducted a literature review and discussed those findings with the community partner, lead physician and MSU clinical faculty. Over the course of approximately four months, the DNP students met virtually with various stakeholders as discussed in the setting facilitators and barriers section.

After meeting with the Director of Access Technology and their staff, it was evident that using text messaging as a reminder modality would not be possible due to the launch of a new text messaging service. It was difficult for DNP students to use this option as the timeline for implementation of the service was not guaranteed. After meeting with the Senior Marketing

Specialist, it was clear that emailing specific patients as a reminder method would not be possible as the large Midwest healthcare organization emails patients in large groups and not based on a specific visit code. Due to the increased workload of the medical assistants and staffing issues, the lead physician of the program determined it would not be feasible to have the medical assistants call patients. All of these options including having the DNP students call patients, was discussed in detail over the course of multiple meetings with the Director Deputy Information Privacy Officer.

The community partner gathered data regarding the number of patients that were evaluated in the clinic based on a specific "post COVID follow up" visit code. After this information was gathered, it was determined that the DNP students would call patients to remind them to fill out the PROMIS-29 form prior to their appointment. The large Midwest healthcare organization EPIC and email access was obtained for the DNP students to access patient information and email providers surveys by the large Midwest healthcare organization's Nursing Professional Development and Education Administrator. The DNP students were provided with an office, computers and phone, located at the large Midwest healthcare organization administration building. The DNP students obtained a script to use when calling patients by the large Midwest healthcare organization's Director Deputy Information Privacy Officer (see Appendix J for voicemail script, see Appendix K for non-patient script, see Appendix L for patient script). The DNP students completed iComply training that was required by the large Midwest healthcare organization, including HIPAA training. Additionally, the DNP students received education from the Director Deputy Information Privacy Officer in order to be compliant when calling patients. This education included information on the phone call script, voicemail protocols and privacy considerations.

The DNP students met with the community partner, lead physician and MSU clinical faculty to determine what completion percentage would indicate a successful intervention. The DNP students developed a pre-intervention and post-intervention survey for providers to complete regarding their attitudes towards the PROMIS-29 form response rate and usefulness in guiding care (see Appendix H for pre-intervention survey, see Appendix I for post-intervention survey). Finally, the DNP students developed an excel spreadsheet that was used to keep track of various data. This data included whether the patient answered, if someone other than the patient answered, if a voicemail was left, and if they have portal access (see Appendix M for data excel spreadsheet).

Do.

The DNP students submitted the project proposal to MSU and the large Midwest healthcare organization's IRBs where the project was determined to be non-human subjects research and exempted from IRB oversight (see Appendix P for MSU IRB letter, see Appendix Q for large Midwest healthcare organization's IRB letter) After consulting with the large Midwest healthcare organization's Director Deputy Information Privacy Officer and research administration department staff, it was determined that a data use agreement was not required and approval to begin the project was granted. This approval was granted by the large Midwest healthcare organization's Director Deputy Information Privacy Officer, Nursing Professional Development and Education Administrator, research administration department staff and MSU clinical faculty.

Prior to calling patients, the DNP students input both surveys into Qualtrics, a survey generating website, in order to email it to providers. The DNP students met with MSU's Qualtrics team on numerous occasions in order to incorporate a random identification (ID)

feature that would allow them to match pre-intervention survey responses to post-intervention survey responses. The community partner then obtained a weekly report of all patients under the specific "post COVID follow up" visit type. Starting in November 2021, the report was sent via the large Midwest healthcare organization's secure email to the DNP students to be utilized to call patients. The report indicated if the patient had MyChart portal access. In the event the patient did not have MyChart access, the DNP students did not contact the patient. This report also included the PCPs that use the specific "post COVID follow up" visit type. The DNP students traveled to 1 Ford Place and emailed the pre-intervention survey on November 2nd, 2021 to 14 PCPs. The providers were given two weeks to complete the pre-intervention survey and a reminder email was sent one week after the survey was originally emailed as a reminder.

The DNP students called patients, from the large Midwest healthcare organization's administration building, within 72 hours of their appointment. The DNP students called patients for a total of six weeks, starting on November 16th, 2021 through December 21st, 2021. The process of calling patients began with using EPIC to view the media tab and determine if the patient had an authorization or representative form. These forms indicate whether patient information can be discussed with someone other than the patient, that the patient appointed as their representative. After consulting EPIC, the DNP students called patients and kept track of the phone call results on the provided spreadsheet (see Appendix M for data excel spreadsheet). After implementing the intervention, the post-intervention survey was emailed to providers on December 28th, 2021. No responses were received within the two weeks following the email and therefore, a reminder email was sent on January 11th, 2022. Due to continued lack of responses, a second reminder and final email was sent on January 20th, 2022, which was successful.

Study.

The DNP students collected the provider surveys and compared results from the pre-intervention survey to the post-intervention survey. The DNP students reviewed the data collected from the excel spreadsheet (see Appendix R for completed data excel spreadsheet). This information was used to compare the frequency of those patients who answered and those who were left a voicemail. Unfortunately, due to a lack of survey responses from providers, it was difficult for the DNP students to determine the effectiveness of the intervention. The results of the project and a discussion surrounding the barriers to this stage in the PDSA cycle are discussed further in the analysis section.

Act.

After implementing the intervention for six weeks, the DNP students analyzed the survey results and identified areas for improvement. Various solutions were discussed in order to address some of the barriers faced by the DNP students. These included provider education, training additional staff and implementing a texting reminder option. Ultimately, increasing awareness of the program would be very valuable as this would hopefully increase provider participation. As the long term effects of the pandemic continue to impact the world, programs such as the large Midwest healthcare organization's COVID-19 recover care program will be required by patients. To support the longevity of this program, various modifications will need to be made. These modifications are discussed further in the sustainability plan section.

Measurement Instruments/Tools

In order to measure the outcomes of this DNP project, pre and post-intervention surveys were utilized (see Appendix H for pre-intervention survey, see Appendix I for post-intervention survey). The DNP students designed the surveys to gather meaningful qualitative data while being concise in order to improve response rates of the survey. Both surveys were converted into

an electronic form via Qualtrics and the survey link was sent to the providers via the large

Midwest healthcare organization's email. The pre-intervention survey was sent prior to the

implementation of the intervention to assess provider's attitudes regarding the helpfulness of the

PROMIS-29 form in managing patients with post-COVID-19 illness. The DNP students inquired

about the provider's perspective on how often the PROMIS-29 form was being completed prior

to the visit. The pre-intervention and post-intervention surveys consisted of the same three

questions and providers could choose from a list of available answers. None of the questions

were required, if the provider chose not to answer a question, they were able to do so.

In addition to the pre-intervention survey and post-intervention survey responses, the

DNP students also gathered additional information through analysis of the excel spreadsheet data

that was collected during the six week intervention process (see Appendix M for data excel

spreadsheet). This data was used to determine how many patients answered the phone, if

someone other than the patient answered and if a voicemail was left. This information was

helpful in order to supplement the survey responses and guide the development of a

sustainability plan.

Analysis

The goal of the DNP project was to increase the completion of the PROMIS-29 form

prior to patient appointments using patient reminder phone calls. Over the course of six weeks,

the DNP students called patients and tracked this information in an excel spreadsheet (see

Appendix R for completed data excel spreadsheet). In the six weeks that the students made

phone calls, a total of six patients were called. Of these six patients, one patient answered, four

patients were left voicemails, and one patient's voicemail box was full (see Appendix S for

results bar chart). The DNP students exclusively called patients who were seeing providers that

received a pre-intervention survey, for this reason there were two weeks in which no patients were called. It is important to note that the DNP students noticed, as the project evolved, more providers were using the "post COVID follow up" visit type. Unfortunately, these provider's patients were not called as they did not receive the pre-intervention survey.

To evaluate the success of the project, pre and post-intervention surveys were conducted. Only one provider completed both surveys. The pre-intervention survey results revealed that the provider believed patients were completing the PROMIS-29 form prior to their appointments 82% of the time. The post-intervention survey results revealed that the provider believed 76% of the time patients were completing the PROMIS-29 form prior to their appointments. In the pre and post-intervention survey, the provider found it very helpful to review the patient's responses on the PROMIS-29 form prior to their appointment. Lastly, they strongly agreed that completion of the PROMIS-29 form prior to the patient visit improved care for patients with post-COVID-19 complications. When comparing these results, the provider's perception was that less patients were completing the form despite receiving the reminder phone call. This does not indicate that the intervention was a success nor a failure. Due to the lack of survey response data, a statistical analysis was not possible and therefore a definite conclusion regarding the results could not be made.

The surveys were designed to be anonymous but inadvertently one provider informed us that they completed the survey, making it no longer anonymous. For this reason, the DNP students were able to match which patient was called based on the provider who completed the survey. Therefore, the DNP students discovered that only one of the provider's patients was called and a voicemail was left. This is important because there is no way of ensuring that the patient received the message, which may also have affected the results of the provider's post-

intervention survey responses. Additionally, it is important to consider that patients may not

answer calls from unfamiliar numbers or check their voicemail prior to their appointment. These

barriers made it difficult for the DNP students to be certain that patients received the message.

For these reasons, texting should be considered as an alternate intervention as it eliminates some

of the barriers that phone calls pose. More information on texting will be provided in the

sustainability plan section.

Due to the limited timeline of this project, the DNP students were not able to conduct

patient reminder phone calls for a period greater than six weeks nor include more providers in

the pre and post-intervention surveys. If this project were implemented in 2022 and beyond,

there would have been more providers using the "post COVID follow up" visit type and thus

more providers to survey. Additionally, it is recommended that patient reminder phone calls be

conducted for longer than six weeks to reach more patients. As this is a new program, the DNP

students believe the project may have had increased success if providers were more aware of the

program and the purpose of the DNP project. Thereby, hopefully increasing provider

participation in survey responses and thus improved data analysis. More information regarding

these recommendations is available in the sustainability plan section.

Sustainability Plan

In the future, it would be beneficial to educate providers prior to implementing the

intervention in order to increase awareness of the project and the COVID-19 recovery care

program. This educational program could also assist with increasing the number of providers

who use the "post COVID follow up" visit type thus increasing the number of patients available

to call. The future implementation of this project into the large Midwest healthcare

organization's workflow is dependent on whether there is available staff to be hired and trained

on the process of calling patients. Allocating staff to educate providers on the COVID-19

recovery care program would also be beneficial to increase provider participation. The DNP

students also recommend that staff call patients two days per week in order to contact all possible

patients. Additionally, it may be beneficial to discuss the possibility of texting patients after the

Information Technology (IT) department's new texting program is launched. This would

eliminate the need to train and hire additional staff for making patient phone calls and eliminate

the issues the DNP students faced with using phone calls as their selected reminder

approach. Lastly, with future implementation, conducting the intervention for a longer period of

time may be beneficial to the success of the project.

Discussion/Implications for Nursing

Unfortunately, the results of the project were not conclusive and thereby making it

challenging to defer how practice would be impacted. With this being said, the COVID-19

recovery care program is newer to the large Midwest healthcare organization and therefore, the

processes for which the program operates are also new. This project was beneficial to the

providers and patients of the COVID-19 recovery care program in the sense that it illustrated that

calling patients may not be the most effective way to remind patients to complete their PROMIS-

29 forms. Prior to the implementation of this DNP project, there was a gap in knowledge

regarding how to increase patient participation in completing the form prior to their appointment.

Using the results from the project, the large Midwest healthcare organization is able to infer that

using other methods such as text messaging or email as reminders may be worth investigating or

utilizing in the future. This would require additional costs as staff would need to be allocated to

continue the project. However, if a reminder modality was found to be successful, this would

prove to be cost effective to the large Midwest healthcare organization in the future, as less provider time would be spent reviewing patient's answers during their appointment.

Ultimately, this project illustrates the importance of discovering effective patient reminder modalities in order to improve patient outcomes. When a patient's PROMIS-29 form can be reviewed ahead of their appointment, providers are able to develop a more comprehensive plan of care. Additionally, more time could be spent during the visit answering the patient's questions, completing a thorough assessment and discussing the treatment plan. As the pandemic continues on, it is assumed that more patients will be in need of the COVID-19 recovery care program services and therefore, it is essential to streamline processes that are currently in place. Recognizing the large Midwest healthcare organization does not currently have standard work or a guideline outlining how to remind patients to fill out their PROMIS-29 form prior to their appointment, this project serves as the first step to improving workflow. The large Midwest healthcare organization's staff can utilize results of this project moving forward and potentially decide to implement a different reminder strategy to improve outcomes. Although the results of the DNP project were not conclusive, the implications for the future of nursing practice are still valuable.

Cost-Benefit Analysis/Budget

Cost efficiency was a priority during the development of this project. This QI project offered many cost-efficient benefits and limited excessive implementation costs. It was the DNP students' goal that as more patients were completing the PROMIS-29 form prior to their appointment, providers would be able to better utilize their appointment time and focus on symptom management. This would be both beneficial to the patient and provider. This process appeared more time efficient by potentially allowing providers to see more patients in a day and

reducing time spent at the clinic. From a financial standpoint, this would possibly allow

providers to see more billable patients in a given day. It is also reasonable to consider that as

more post-COVID-19 patients are managed in the outpatient setting, emergency room associated

healthcare costs may possibly be reduced. The intervention was implemented by the DNP

students using the large Midwest healthcare organization's current resources, creating no

additional costs to the large Midwest healthcare organization.

According to the U.S. Bureau of Labor Statistics (2021), the mean hourly wage for

registered nurses in Michigan is $38.47 per hour. The time taken to conduct patient phone call

reminders averaged about 30 to 60 minutes depending on the number of patients scheduled. The

DNP students called patients for a total of six weeks and sent surveys and survey reminder

emails for four additional weeks. The reports given to the DNP students by the community

partner are generated by the large Midwest healthcare organization's data analytics department.

The estimated time taken to generate a report is about 30 minutes to 60 minutes per report, for a

total of approximately eight hours. The mean hourly wage for a data analyst at the large Midwest

healthcare organization is estimated at $45.38 (Indeed, 2021). The DNP students traveled

approximately 18.5 miles per trip to 1 Ford Place and the cost of transportation for DNP students

was also included in the budget. The DNP students spent a total of 240 hours on this project. The

total cost of this project was $18,828.64. For the purpose of the project, the DNP students

donated their time. For more information, a detailed budget can be located in Appendix T.

Conclusion

As the pandemic continues to impact every aspect of our lives, there are many individuals

who are still managing the long-term health effects of COVID-19. Greenhalgh et al. (2020)

explains that patients may experience various respiratory, cardiac, gastrointestinal and neurologic

symptoms months beyond the acute phase of the infection. Since COVID-19 is a novel virus,

there is limited evidence regarding its lasting effects and how to manage this population

(Greenhalgh et al., 2020). Despite these obstacles, the large Midwest healthcare organization has

developed a COVID-19 recovery care program with the goal of improving care for patients

experiencing long term effects of COVID-19. In order to effectively manage this population, the

large Midwest healthcare organization is using the PROMIS-29 form to evaluate patient's

symptoms and treatment response. Following discussions with the community partner and

stakeholders, it was determined that having the patients complete this form prior to their

appointment would be beneficial. After a thorough literature review of the current evidence, it

was evident that calling patients would be an effective reminder modality (Amankwaa et al.,

2018; Brandzel et al., 2017; Coronado et al., 2018; Ivers et al., 2020; Zangalli et al., 2016).

Through the use of the PDSA cycle, the DNP students developed an evidenced based

DNP project for the large Midwest healthcare organization's COVID-19 recovery care program.

Over the course of six weeks, the DNP students called patients prior to their post-COVID-19

follow up appointment to remind them to complete the PROMIS-29 form. In order to determine

the effectiveness of the intervention a pre and post-intervention survey was emailed to large

Midwest healthcare organization's providers. Unfortunately, due to the lack of survey responses

received, there was not enough data to confidently determine whether or not the intervention was

successful. Although it was not feasible to conduct a statistical analysis on the limited data

available, there was a level of clinical significance in our findings which suggested that

exploring other reminder modalities may be beneficial. In the future the large Midwest

healthcare organization could consider texting patients to remind them to fill out the PROMIS-29

form prior to their appointment. In order to learn more about the long term trajectory of COVID-

19, more research and quality improvement projects will need to be conducted to effectively

manage this patient population.

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Appendix A

PROMIS-29 Form

PROMIS®–29 Profile v2.1

Please respond to each question or statement by marking one box per row.

Physical Function		Without any difficulty	With a little difficulty	With some difficulty	With much difficulty	Unable to do
PFA11	Are you able to do chores such as vacuuming or yard work?	5	4	3	2	1
PFA21	Are you able to go up and down stairs at a normal pace?	5	4	3	2	1
PFA23	Are you able to go for a walk of at least 15 minutes?	5	4	3	2	1
PFA53	Are you able to run errands and shop?	5	4	3	2	1
Anxiety **In the past 7 days…**		Never	Rarely	Sometimes	Often	Always
EDANX01	I felt fearful	1	2	3	4	5
EDANX40	I found it hard to focus on anything other than my anxiety	1	2	3	4	5
EDANX41	My worries overwhelmed me	1	2	3	4	5
EDANX53	I felt uneasy	1	2	3	4	5
Depression **In the past 7 days…**		Never	Rarely	Sometimes	Often	Always
EDDEP04	I felt worthless	1	2	3	4	5
EDDEP06	I felt helpless	1	2	3	4	5
EDDEP29	I felt depressed	1	2	3	4	5
EDDEP41	I felt hopeless	1	2	3	4	5
Fatigue **During the past 7 days…**		Not at all	A little bit	Somewhat	Quite a bit	Very much
HI7	I feel fatigued	1	2	3	4	5
AN3	I have trouble starting things because I am tired	1	2	3	4	5

Fatigue

	In the past 7 days...	Not at all	A little bit	Somewhat	Quite a bit	Very much
FATEXP41	How run-down did you feel on average?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
FATEXP40	How fatigued were you on average?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Sleep Disturbance

	In the past 7 days...	Very poor	Poor	Fair	Good	Very good
Sleep109	My sleep quality was	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1

	In the past 7 days...	Not at all	A little bit	Somewhat	Quite a bit	Very much
Sleep116	My sleep was refreshing.	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1
Sleep20	I had a problem with my sleep	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Sleep44	I had difficulty falling asleep	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Ability to Participate in Social Roles and Activities

		Never	Rarely	Sometimes	Usually	Always
SRPPER11_CaPS	I have trouble doing all of my regular leisure activities with others...	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1
SRPPER18 CaPS	I have trouble doing all of the family activities that I want to do..	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1
SRPPER23 CaPS	I have trouble doing all of my usual work (include work at home)	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1
SRPPER46 CaPS	I have trouble doing all of the activities with friends that I want to do...	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1

Pain Interference

	In the past 7 days...	Not at all	A little bit	Somewhat	Quite a bit	Very much
PAININ9	How much did pain interfere with your day to day activities? ...	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
PAININ22	How much did pain interfere with work around the home?........	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
PAININ31	How much did pain interfere with your ability to participate in social activities?........................	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Pain Interference
In the past 7 days...

		Not at all	A little bit	Somewhat	Quite a bit	Very much
PAININ34	How much did pain interfere with your household chores?.........	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Pain Intensity
In the past 7 days...

Global07	How would you rate your pain on average?.....................................	☐ 0 No pain	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7	☐ 8	☐ 9	☐ 10 Worst pain imaginable

From "PROMIS-29 Profile v2.1," by PROMIS Health Organization, 2018 (https://www.healthmeasures.net/search-view-measures?task=Search.search). Copyright 2008-2018 by PROMIS Health Organization. Reprinted with permission.

Appendix B

Fishbone Diagram

Fishbone Diagram

Appendix C

PDSA Cycle

Plan
- Meet with community stakeholders
- Gather demographic data
- Conduct literature search/review
- Create surveys/excel spreadsheet for data collection

Do
- Obtain email/EPIC access
- Privacy education
- Travel to adminstrative building to call patients
- Email providers pre and post-intervention surveys

Study
- Collect survey responses
- Analyze pre and post-inerveniton survey responses
- Determine effectiveness of intervention

Act
- Identify areas of improvement
- Adjust intervention as needed
- Develop sustainability plan

Appendix D

PRISMA Diagram

Identification

Articles identified from
    CINAHL(n = 68)
    PubMed (n = 137)

Articles removed *before screening*:
    Duplicate articles removed (n = 18)
    Articles removed for other reasons (n = 92)*

Screening

Articles screened
(n = 95)

Records excluded based on title/abstract
(n = 63)

Articles read for full review
(n = 32)

Articles excluded after full review
(n = 24)

Articles assessed for eligibility
(n = 8)

Articles excluded
(n = 0)

Included

Total articles included in review
(n = 8)

Qualitative articles included
(n = 1)

Quantitative articles included
(n = 7)

* Reasons: must be written in English between 2016 and 2021

Appendix E

Literature Table

Author/Title	Level of Evidence & Framework	Purpose of the project/research	Patient population	Results	How does this relate to your project?	Implications for Practice
Title: Do reminder emails and past due notifications improve patient completion and institutional data submission for patient-reported outcome measures? Author: Stephanie L. Pugh, Joseph P. Rodgers, Jennifer Moughan, Roseann Bonanni, Jaskaran Boparai, Ronald C.	Level IV- Case control Framework - none	The purpose of this study was to determine if automatic email reminders increased the patient's completion, submission and timeliness of the patient-reported outcome measures (PROMs) form. This form is completed by a patient regarding their functional, psychological and physical health which is helpful for ongoing oncology research.	Adult oncology patients who are enrolled in an NRG clinical trial	Submission of the PROM form was significantly timelier in clinical trials with automatic email reminders as compared to those trials without. For prostate cancer trials with automatic email reminders, timely submission was 79.7% in one month compared to 75.7% in trials without reminders. For breast cancer trials with automatic email reminders, timely submission was 59.2% in one month compared 31.3% in trials without reminders.	The results of this study support the use of automatic email reminders to improve submission of forms. However, this study did not prove that forms were completed in their entirety due to the email reminders.	Automatic email reminders can be utilized to improve patient compliance with submitting necessary forms.

Chen, James J. Dignam, Deborah W. Bruner						
Title: Cancer Screening Reminders: Addressing the Spectrum of Patient Preferences Author: Susan D Brandzel, Erin J Aiello Bowles, Arika Wieneke; Susan Carol Bradford, Kilian Kimbel, Hongyuan Gao, Diana SM Buist	Level VI- Qualitative study Framework - none	The purpose of this study was to utilize patient focus groups to explore and understand patient's perspectives on cancer screenings. This study also sought to understand patient preferences regarding screening reminders.	Women 21-75 years old and men 50-75 years old in Washington state.	Patient qualitative responses from the focus groups were coded for analysis. Patients preferred personalized reminders less than 3 months before the screening date. Most patients, especially younger patients preferred text message and email reminders. Older adults preferred phone call versus mailed letter to allow time to ask questions and schedule their appointment.	One can infer that giving patients the choice as to how they are reminded of cancer screening appointments can translate into patients submitting the PROMIS tool prior to their appointment. It is assumed that patients prefer text or email reminders.	Investing in a system that can give patients the opportunity to choose their preferred reminder modality may increase patient participation in care.
Title: Using digital notifications to improve attendance in clinic: systematic review and meta-analysis Author: Dan Robotham, Safarina Satkunanathan, John Reynolds, Daniel Stahl,	Level I: Systematic review and meta-analysis Framework - Cochrane's framework	The purpose of this study was to determine the effect of text messaging reminders on improving patient's attendance at clinic appointments.	21 studies were included in the systematic review for a total of 8345 patients receiving text messages and 7731 patients receiving no text message. Patients were primarily adults and studies were conducted in Europe, Asia, Africa, Australia	Patients who received text messages were 23% more likely to attend their clinic appointment compared to patients who did not receive a text. Patients with text reminders were 25% less likely to not show for an appointment. Multiple notifications improved adherence rates.	One can infer that if text message reminders improve patient compliance with going to their appointment then text messages can be used to improve patient compliance with completing the PROMIS tool, especially if multiple reminders are sent.	Utilizing text messages can improve patient adherence to clinic appointments and prevent no shows.

Til Wykes			and America.			
Title: Effect of Reminding Patients to Complete Fecal Immunochemical Testing: A Comparative Effectiveness Study of Automated and Live Approaches. Author: Gloria D. Coronado,, Jennifer S. Rivelli, Morgan J. Fuoco, William M. Vollmer, Amanda F. Petrik, Erin Keast, Sara Barker, Emily Topalanchik, Ricardo Jimenez	Level II: Randomized control trial Framework - none	The purpose of this study was to examine the effectiveness of different reminder modalities (text, email, phone call, mailed letter) on patient compliance with fecal immunochemical testing (FIT).	2772 adults between the ages of 50–75 that are not up to date with colorectal cancer screenings and located in the State of Washington.	Patients were all initially mailed a letter and FIT, of those patients only 10% returned their FIT sample within 3 weeks of receiving the letter. Of those who didn't return the FIT, 25.5% returned the FIT after reminders were sent. Return rates were higher for those receiving a live phone call versus text message or letter.	One can infer that if patient reminders increase compliance with FIT, then reminders will increase compliance with completing the PROMIS tool. It appears reminders that include a live phone call are more effective than text messages alone.	Utilizing patient reminders such as live phone calls can increase patient compliance for completing FIT.
Title: Interventions supporting long term adherence and decreasing cardiovascular events after myocardial infarction	Level II: Randomized control trial Framework - Behavioral theory	The purpose of the study was to evaluate interventions designed to improve long term adherence to the recommended secondary prevention treatment after a myocardial infarction	9 of the 18 cardiac centers in Ontario participated in the study. The population 2,632 patients which included all adults with a valid provincial	The patients were randomized into intervention groups. The interventions included mail plus phone calls, mail only, and usual care which included communication which varied between the hospital team, primary care provider and outpatient specialist when needed. 27% of patients in the usual care	The results of this study support the implementation of an interventions of mail-outs in the addition of a phone calls can improve patient adherence for completion of cardiac rehab. One can infer	The use of mail-out education brochures with the use of phone calls can increase the adherence and completion of cardiac rehab post MI

(ISLAND): pragmatic randomised controlled trial Author: Noah M Ivers, Jon-David Schwalm, Zachary Bouck, Tara McCready, Monica Talijaard, Sherry L Grace, Jennifer Cunningham, Beth Bosiak, Justin Presseau, Holly O Witteman, Neville Suskin, Harindra C Wijeysundera, Clare Atzema, R Sacha Bhatia, Madhu Natarajan, Jeremy M Grimshaw			health card number, had a coronary angiogram post STEMI or NSTEMI with evidence of CAD and were discharged from the center after the procedure.	group, 32% of patients in the mailed letter only group and 37% of patients in the mailed letter plus phone call group completed cardiac rehabilitation.	that implementation of these interventions can increase patient adherence to other aspects of their healthcare	
Title: Effectiveness of short message services and voice call interventions	Level I: Systematic review and meta-analysis of randomized controlled	The purpose of the review was to determine when including all mobile phone-based interventions, whether the use of mobile	The review included 13 RCTs and 2 cohort and quasi-experimental studies in which	7 of the RCTs measure the effect of SMS intervention and 4 measures the effect of voice calls. Mobile SMS intervention had a significant effect on adherence to ART however, only scheduled SMS rather than triggered SMS.	The results of the study showed that scheduled mobile phone messaging improved patient compliance with ART. One can infer that the use of mobile text	The use of scheduled mobile phone messaging can be utilized to increase the adherence to ART

for antiretroviral therapy adherence and other outcomes: A systematic review and meta-analysis Author: Isaac Amankwaa, Daniel Boateng, Dan Yedu Quansah, Cynthia Pomaa Akuoko, Catrin Evans, Javier R. Lama	trials and quasi-experimental studies Framework - none	phone technologies can improve antiretroviral therapy (ART) adherence	11 RCTs were included in the meta-analysis. The studies included HIV positive individuals receiving ART majority being were >18 years of age, gender, or clinical state of HIV infection in a primary, outpatient, community and hospital care setting.	Mobile voice interventions had no significant association with increased adherence.	messaging could increase patient compliance with filling out the PROMIS tool.	
Title: E-mail reminders improve completion rates of patient-reported outcome measures Authors: Jacob Triplet, Enesi Momoh, Jennifer Kurowicki, Leonardo D. Villarroel, Tsun Yee Law, Jonathan	Level IV: Retrospective Case Control study Framework - none	The purpose of the study was to evaluate whether email reminders would improve the completion of the Simple Shoulder Test (SST) and 12-Item Short Form Health Survey questionnaires after elective shoulder surgery	186 patients who underwent shoulder surgery during October 2012 to July 2013 with preoperative survey data	There were two groups examined. The tablet group consisted of patients who completed the tablet-based surveys in the office during the planned follow-up visit and those patients who completed the survey online but subsequently scheduled their missed appointment. The email group consisted of patients who completed surveys using the online portal following an email reminder after a missed office visit combined with the tablet-only group. Results were evaluated at 1 year and 2 year follow-up. There was a 25.8% increase in survey completion rate for a complete data set which is	The results of this study can be used to support the implementation of email reminders to increase the completion rates of the PROMIS tool.	Implementation of email reminders for post-operative shoulder surgery patients can increase the completion rates of patient-reported outcome measure surveys

C Levy				preoperative, 1-year postoperative, and 2-year postoperative follow-up, for those in the email reminder group.		
Title: An Education- and Telephone-Based Intervention to Improve Follow-up to Vision Care in Patients with Diabetes: A Prospective, Single-Blinded, Randomized Trial Authors: Camila S. Zangalli, Ann P. Murchison, Nicole Hale, Lisa A. Hark, Laura T. Pizzi, Yang Dai, Benjamin E. Leiby, Julia A. Haller	Level II: single-blinded, randomized controlled trial Framework - none	The purpose of the study was to evaluate the effectiveness of communication interventions on dilated fundus examination follow-up adherence-specifically patients with no, mild, or moderate diabetic retinopathy who are less likely to adhere	521 Diabetic adult patients 18 years or older between April and October 2012, who were previously seen in the general eye clinic and were due for a follow-up dilated fundus examine who had no, mild, or moderate diabetic retinopathy	Patients were randomized to the usual care group and an intervention group. The study concluded that patients in the intervention group were more likely to schedule an appointment than the usual care group. The likelihood of attending appointment was increased by 58%. 24% of patients scheduled appointments after receiving the letter and brochure. 40% of the patients on call list made appointment after the first call. The study concluded that a combination of personalized mail and phone communications are effective in improving DFE adherence than solely standard mail reminders	One can infer that if personalized mail and phone communications can improve DFE adherence than these same interventions may improve adherence to completion of the PROMIS tool	Personalized mail and phone communications can improve the adherence rates to DFE follow-up rates

Appendix F

Themes Table

Article	Intervention 1: Text message	Intervention 2: Email	Intervention 3: Phone call	Intervention 4: Mailed Letter
Article 1: Pugh et al. (2021)		X		
Article 2: Brandzel et al. (2017)	X	X	X	
Article 3: Robotham et al. (2016)	X			
Article 4: Coronado et al. (2018)	X		X	X
Article 5: Ivers et al. (2020)			X	X
Article 6: Amankwaa et al. (2018)	X		X	
Article 7: Triplet et al. (2017)		X		
Article 8: Zangalli et al. (2016)			X	X

Appendix G

SWOT Analysis

Strengths
- Team is very responsive and timely with communicating
- Our group members are effective communicators
- Group works well together, completes tasks on time
- Willing to brainstorm different solutions to issues that arise
- Strong stakeholder involvement
- The team is inviting, allowing us to be involved in multidisciplinary meetings
- Resources (MSU faculty, Jessica Sender) are willing and available to help guide our intervention

Weaknesses
- Completing project within allotted time
- May struggle with lack of direction from team
- Coordinating scheduled meetings with multiple stakeholders
- Still learning the quality improvement process
- Determining how to measure the effectiveness of the intervention may be challenging
- Service is new and many providers are not aware of the program yet
    Technological barriers

Opportunities
- Reduce health disparities related to post COVID-19 long term effects
- Improve the health outcomes of citizens of Detroit and surrounding areas
- Decrease the number and severity of post COVID-19 complications
- Improve the process for managing post COVID-19 patients

Threats
- Potential lack of access to MyChart in order to complete PROMIS-29 form
- Some patients may not have internet access
- Patients may not answer their phone or return the phone call
- Patient resistance towards filling out another health form

Appendix H

Pre-Intervention Survey

This survey is being done to help us evaluate the effectiveness of completing the PROMIS-29 tool prior to the patient visit. We are asking you to complete a survey before we implement our intervention (calling patients to remind them to fill out the questionnaire). Our group would like to determine if we are increasing the rate of form completion prior to the patient appointment. Participation in this survey is voluntary and you may refuse to answer any question. You may withdraw or stop participating at any time without consequence. By completing the survey, you are indicating your voluntary agreement to participate.

1. What percentage of the time, is the PROMIS-29 tool completed by the patient, at home, prior to the patient visit?

   - Providers are able to indicate a percentage on a scale from 0-100%

2. In your opinion, how helpful is it to review the patient's PROMIS-29 tool answers prior to the patient visit?

   a. Very helpful

   b. Helpful

   c. Somewhat helpful

   d. A little helpful

   e. Not helpful at all

      - If provider selects E, they will be asked to provide a response explaining their answer in a text box.

3. Indicate your opinion of the following statement: Completion of the PROMIS-29 tool prior to the patient visit improves care for those with post COVID-19 complications.

   a. Strongly agree

   b. Agree

   c. Neutral

d. Disagree

e. Strongly disagree

- If provider selects E, they will be asked to provide a response explaining their

answer in a text box.

Appendix I

Post-Intervention Survey

This survey is being done to help us evaluate the effectiveness of completing the PROMIS-29 tool prior to the patient visit. We are asking you to complete a survey now that we have implemented our intervention (calling patients to remind them to fill out the questionnaire). Our group would like to determine if we increased the rate of form completion prior to the patient appointment. Participation in this survey is voluntary and you may refuse to answer any question. You may withdraw or stop participating at any time without consequence. By completing the survey, you are indicating your voluntary agreement to participate.

1. What percentage of the time, is the PROMIS-29 tool completed by the patient, at home, prior to the patient visit?

   - Providers are able to indicate a percentage on a scale from 0-100%

2. In your opinion, how helpful is it to review the patient's PROMIS-29 tool answers prior to the patient visit?

   a. Very helpful

   b. Helpful

   c. Somewhat helpful

   d. A little helpful

   e. Not helpful at all

      - If provider selects E, they will be asked to provide a response explaining their answer in a text box.

3. Indicate your opinion of the following statement: Completion of the PROMIS-29 tool prior to the patient visit improves care for those with post COVID-19 complications.

   a. Strongly agree

   b. Agree

   c. Neutral

d. Disagree

e. Strongly disagree

- If provider selects E, they will be asked to provide a response explaining their

answer in a text box.

Appendix J

Voicemail Script

"Hi, this is (insert name here) from (insert large Midwest healthcare organization's name), please

check your MyChart for a form that needs to be completed before your upcoming appointment."

Appendix K

Non-Patient Script

"Hi, this (insert name) from (insert large Midwest healthcare organization's name), is (insert

patient name) available to speak with me?"

If a patient is not available: "Thank you, I will call them back at another time."

Appendix L

Patient Script

"Hi, this is (insert name) from (insert large Midwest healthcare organization's name). I'm a nurse practitioner student from Michigan State University and I'm conducting a quality improvement project regarding completing forms prior to appointments. Is it okay if we discuss your upcoming appointment?"

If patient answers yes: "Please complete the form in your MyChart portal titled PROMIS-29 prior your upcoming appointment on (insert date). It is helpful for your provider to review your answers prior to your appointment."

If patient answers no: "Thank you for your time."

Appendix M

Data Excel Spreadsheet

Call Date	Did the patient answer?		Did someone other than the patient answer?		Did the patient's representative or authorized contact answer?		Does the patient have portal access?		Did we call the patient back?		Did we leave a voicemail?		
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	
	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
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	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	

Appendix N

Agency Letter

NURSING DEVELOPMENT & RESEARCH

Henry Ford Health System
One Ford Place, Suite 2B
Detroit, Michigan 48202
(313) 874-6700 Office
(313) 874-6701 Fax

Henry Ford Hospital
2799 West Grand Blvd.
F-Basement, F006
Detroit, Michigan 48202
(313) 916-1098 Office
(313) 916-9144 Fax

August 11, 2021

To the Michigan State University College of Nursing:

I am familiar with the quality improvement project being conducted by Abrielle Wildman and Danielle Sweeney entitled "A Quality Improvement Project for Post-COVID-19 Patients through Reminder Phone Calls". I understand that Henry Ford Health System involvement will include the mentorship of the above-named students and will require the application of the proposed process including: reviewing our current processes and/or practice, accessing records for review, protocols and practices related to the project, participation in improvement team meetings, access to benchmark and performance data, revising current policy/procedures related to this process, obtaining Henry Ford Health System email access, emailing providers a pre-intervention and post-intervention survey, accessing private patient information via the EPIC system, and calling patients.

I have read the project's proposal and am comfortable with the project as describe being conducted at our institution. I understand that this project will be carried out following sound, ethical principles. The Henry Ford Health System gives permission for the students to disseminate project data and outcomes at Michigan State University College of Nursing for the purpose of academic course completion and any other entities with prior organization approval .

Therefore, as a representative of the Henry Ford Health System, I agree that Abrielle Wildman and Danielle Sweeney's evidence-based project may be conducted at our institution.

Sincerely,
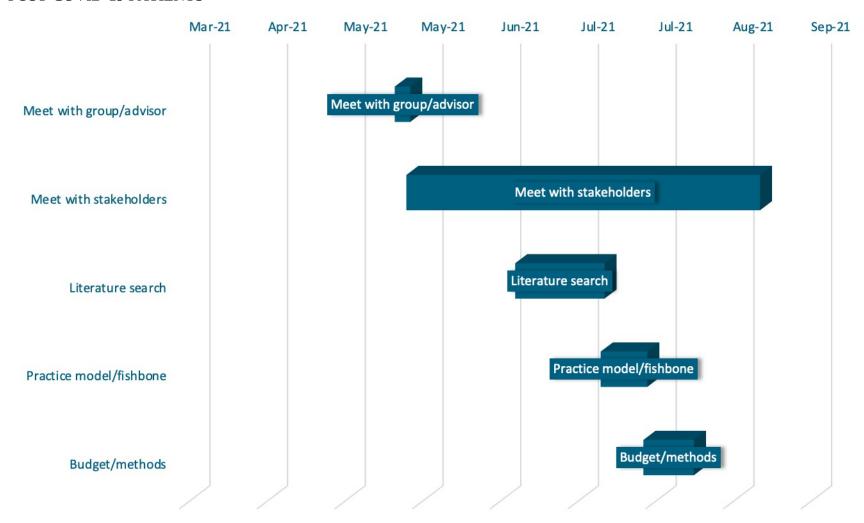
Mary Kravutske, PhD, RN
Administrator
Nursing Professional Development & Education
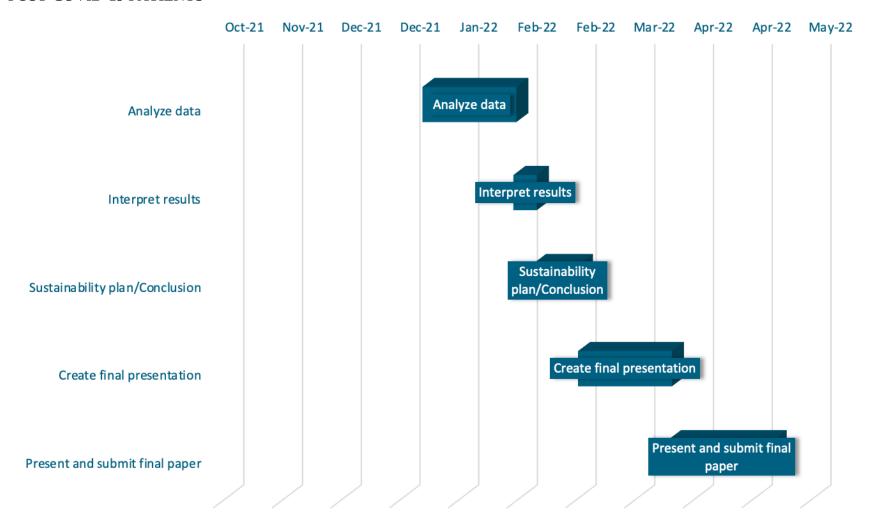Henry Ford Hospital

Appendix O

GANTT Chart

Appendix P

MSU IRB Determination Letter

MICHIGAN STATE
U N I V E R S I T Y

DETERMINED NOT "RESEARCH"
Revised Common Rule

September 14, 2021

To: Abby Wildman

Re: **MSU Study ID:** STUDY00006639
Principal Investigator: Abby Wildman
Determination Date: 9/14/2021

Title: DNP Project- A Quality Improvement Project for Post-COVID-19 Patients through Reminder Phone Calls

The activity described in this submission was determined not to be "research" as defined by the Common Rule as codified in the U.S. Department of Health and Human Services (DHHS) regulations for the protection of human research subjects.

Definition of Research
For DHHS, "*Research* means a systematic investigation, including research development, testing, and evaluation, designed to develop or contribute to generalizable knowledge. Activities that meet this definition constitute research for purposes of this policy, whether or not they are conducted or supported under a program that is considered research for other purposes. For example, some demonstration and service programs may include research activities. For purposes of this part, the following activities are deemed not to be research:

Office of Regulatory Affairs
Human Research Protection Program

4000 Collins Road
Suite 136
Lansing, MI 48910

517-355-2180
Fax: 517-432-4503
Email: irb@msu.edu
www.hrpp.msu.edu

(1) Scholarly and journalistic activities (e.g., oral history, journalism, biography, literary criticism, legal research, and historical scholarship), including the collection and use of information, that focus directly on the specific individuals about whom the information is collected.

(2) Public health surveillance activities, including the collection and testing of information or biospecimens, conducted, supported, requested, ordered, required, or authorized by a public health authority. Such activities are limited to those necessary to allow a public health authority to identify, monitor, assess, or investigate potential public health signals, onsets of disease outbreaks, or conditions of public health importance (including trends, signals, risk factors, patterns in diseases, or increases in injuries from using consumer products). Such activities include those associated with providing timely situational awareness and priority setting during the course of an event or crisis that threatens public health (including natural or man-made disasters).

(3) Collection and analysis of information, biospecimens, or records by or for a criminal justice agency for activities authorized by law or court order solely for criminal justice or criminal investigative purposes.

MSU is an affirmative-action, equal-opportunity employer.

Appendix Q

Large Midwest Healthcare Organization IRB Determination Letter

Research Administration
Henry Ford Health System
1 Ford Place – 2F
Detroit, MI 48202-2689
(313) 874-4464 Office
(313) 874-4288

NOT HUMAN SUBJECTS RESEARCH ACKNOWLEDGMENT

To: Eunice Yu, MD
              Public Health Sciences

From: Ellen Ryall

Date: October 20, 2021

IRB No.: 15199

Title: A Quality Improvement Project for Post-COVID-19 Patients through Reminder Phone Calls

The activities described by the Principal Investigator involve a quality improvement project focused on

improving patient compliance with completing the PROMIS-29 form prior to their COVID-19 follow up

appointment. As such, the activities do not meet the definition of human subjects research, as defined by the Common Rule and thereby this is determined not to be human subject research.

The project also does not involve a test article (drug or device) and therefore, the FDA regulations do not apply.

Therefore, this study does not require review by the Henry Ford Health Systems (HFHS) IRB.

Please contact Pre-Award in the Research Administration Dept. to determine if any agreements will need to be executed for HFHS data to be shared with and/or sent to non-HFHS entities for this Quality Improvement Project. For assistance with agreements, Please contact: Crystal Moffett, Research Grant/Contract Analyst, (313) 874-4354, cmoffet2@hfhs.org

NOTE: When publishing the results of a Program Evaluation/Quality Improvement/Quality Assurance project, the publication must clearly state that the activities involved were done for the purposes of Program Evaluation/Quality Improvement/Quality Assurance, not research.
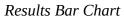
Please contact the IRB Administration Office at 313-874-4464 or ResearchAdmin@HFHS.org if you have any questions or concerns.
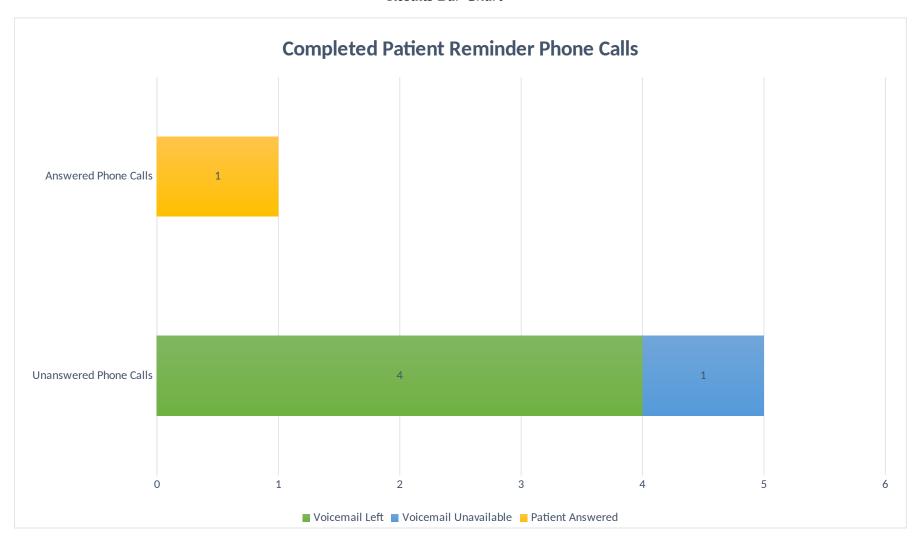
Appendix R

Completed Data Excel Spreadsheet

Call Date	Did the patient answer?		Did someone other than the patient answer?		Did the patient's representative or authorized contact answer?		Does the patient have portal access?		Did we call the patient back?		Did we leave a voicemail?	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
11/16/21	☐	☑	☐	☑	☐	☐	☑	☐	☐	☑	☑	☐
11/16/21	☐	☑	☐	☑	☐	☐	☑	☐	☐	☑	☑	☐
11/16/21	☑	☐	☐	☐	☐	☐	☑	☐	☐	☑	☐	☑
11/23/21	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
11/30/21	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
12/7/21	☐	☑	☐	☑	☐	☐	☑	☐	☐	☑	☑	☐
12/14/21	☐	☑	☐	☑	☐	☐	☑	☐	☐	☑	☑	☐
12/21/21	☐	☑	☐	☑	☐	☐	☑	☐	☐	☑	☐	☑

Appendix S

Results Bar Chart

Appendix T

Project Budget Analysis

May 2021 through April 2022

Expense	Source	Cost	Total
Personnel			
• DNP Student: Abby	In-Kind	38.47/hour x 240 hours	$9,232.80
• DNP Student: Danielle	In-Kind	38.47/hour x 240 hours	$9,232.80
• Data Analyst	Direct	45.38/hour x 8 hours	$363.04
Other Expenses			
• DNP Travel Costs	In-Kind	370 mi/20mi. per gal. x 3.18/per gal.	$58.83
Total			$18,828.64