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Patient Care Management of Hypertension Through Improving Follow-up and Reducing Missed Appointments in a Primary Care Clinic: A QI Project

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PATIENT CARE MANAGEMENT OF HYPERTENSION THROUGH IMPROVING FOLLOW-UP AND REDUCING MISSED APPOINTMENTS IN A PRIMARY CARE CLINIC: A QI PROJECT

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Keywords: primary health care, patient care management, follow-up, hypertension, missed appointments, reminder systems, no-show, rescheduling process, blood pressure log

Patient Care Management of Hypertension Through Improving Follow-Up and Reducing Missed Appointments in a Primary Care Clinic: a QI Project

Advances in healthcare technology have allowed for better and more improved appointment reminder systems (Crutchfield & Kistler, 2017). However, missed appointments, also referred to as no-shows remain a significant problem. Annually, it is estimated that between 5 to 55% of patients miss appointments, and the healthcare system loses about $150 billion yearly in revenue to missed appointments (Ullah et al., 2018). The timeliness of these primary care appointments is critical in identifying deficits in a patient's health status such as in patients with hypertension and can lead to improvements in health outcomes, reduce hospitalizations, and reduce mortality (Crutchfield & Kistler, 2017). Appropriate follow-up allows providers to complete other assessments, and interventions, make necessary referrals, review results, and adjust the plan of care based on their findings. The organization assessment showed that patients were not sent reminders at certain intervals to be notified of their upcoming appointment. This lack of practice often led to missed appointments. A study by Steiner et al. (2016) demonstrated that appointment reminders via phone or text message were effective in reducing missed primary care appointments.

Hypertension occurs as a result of continued elevated pressure in the blood vessels over time (Zeng et al., 2020). According to the Centers for Disease Control and Prevention (CDC) (2022), hypertension accounts for about 34 million primary care visits in the nation. It is a modifiable risk factor that contributes to roughly 45% of cardiovascular disease causes of death and disability (Zeng et al., 2020). As a result, the American Heart Association (AHA) published guidelines on the management and evaluation of adults with hypertension.

Statement of the Problem

The importance of follow-up appointments cannot be overemphasized, especially in patients with chronic health conditions such as hypertension. Follow-up appointments are also a good way of monitoring the progress made by these patients and this is where specific clinical values are monitored and discussed (Crutchfield & Kistler, 2017). This primary care clinic is marked by ineffective interventions to reduce missed appointments. For patients with hypertension seen at the clinic, proper blood pressure monitoring technique is not always emphasized, and these patients do not keep track of their blood pressure, which in turn may lead to delays in the adjustment of health plans and therapies. So, reducing missed appointments should increase their compliance and thus improve the quality of outcomes

This clinic did not yet have a specific policy or protocol for patients who missed appointments. It is realistic to expect a few missed appointments among the patients seen daily. However, when a small number of patients becomes substantial, missed appointments must be acknowledged as a challenge for the clinic to address. Fortunately, this project may be seen as a chance to boost revenue through missed appointments and enhance operations.

Background and Significance

Missed follow-up appointments constitute significant problems clinics and health centers face nationwide (Ullah et al., 2018). A significant portion of primary care providers' patients will require follow-up appointments to manage their chronic illnesses. Typically, these appointments are scheduled every 3 months, but some are scheduled within 4 weeks. Some patients may need routine labs before their return but without reminders, they may forget to do so. Without these, it is hard to manage their care. During follow-up appointments, clinical values, medications, and treatment plans are discussed (Crutchfield & Kistler, 2017). In addition, it is a

good way of monitoring progress made by patients such as weight loss, smoking cessation, exercise, pain management, diet modifications, and overall improvement in health status.

About 20 to 40% of patients seen at this clinic have a history of hypertension. Uncontrolled hypertension has been shown to increase the risk of certain cardiovascular disease events and mortality (Zhou et al., 2018). Follow-up appointments are crucial for patients with hypertension to monitor for more life-threatening signs and manage their overall care (Mahmood et al., 2020).

Organization Assessment

Purpose

The purposes of health care facilities are most often described in a formal mission, vision, and value statement (Trybou et al., 2017). These formalized statements communicate the facility's goal to those who interact with it, including patients and employees (Trybou et al., 2017). The purpose of this primary care clinic is to provide immediate and preventive care services, health education, counseling, and health record maintenance, to its patients. Additionally, the clinic promotes health and wellness in response to the patient's identified needs. This includes providing referrals for preventive tests such as mammograms and colonoscopies to patients. All health services provided by the clinic aim to supplement and support the mission of the clinic and the community it serves.

Patients

Many of the patients seen at the clinic are insured through the healthcare marketplace—most of the patients are insured under Molina. A records review of the previous 9 months revealed the patient demographics seen at the clinic at 48% male and 52% female. Additionally, 99.8% of patients were between 20 and 75 years old, 0.1% were between 17 and 19 years old, and 66 to 77 years old. Although the clinic's demographic information could not be obtained

directly through the clinic itself, demographic information about the patient population that the clinic serves is available through the census website (United States Census Bureau, n.d.). According to the 2020 census data, the race and ethnicities of over 25 thousand people living in the surrounding area of the clinic are predominantly white (83%), and the remainder of the population is 22% (United States Census Bureau, n.d.). Diagnosis and conditions of these individuals vary at this clinic. The most common diagnoses were hypertension, diabetes mellitus, hyperlipidemia, depression, and hypothyroidism.

Professionals

The provider team in the clinic is composed of one doctorally-prepared nurse practitioner who is also the owner and director of the clinic. He is also the sole provider and works with a collaborative physician who does not engage in the day-to-day physical activities of the clinic. In addition to the nurse practitioner, the clinic also has one medical assistant, the front desk personnel, and a biller. There is a plan to open the clinic for in-person visits by the fall of 2022. Currently, the clinic's owner who is also the provider works full-time and oversees some parts of the patient registration, notifies patients when lab results are available, and manages some of the patient scheduling. The administrative assistant, whose primary duties include collecting clinic deposits, and provider scheduling, also works part-time from home. Overall, the entire staff reports being pleased with the professional work environment in which clinic activities take place and feel amply supported and recognized in the work they perform. All the staff members are easygoing with favorable attitudes, creating a cohesive and productive team. Part of this team atmosphere is also due to how small the practice is, ironically. They would all like to see the clinic expand in size once they open up to in-person visits.

Process

The normal processes of this health clinic microsystem vary depending on the type of patient visit. The primary care visit process begins when the patients are asked to create a new registration through the patient portal electronic health record (EHR) managed by KareO. Since all the visits are being carried out virtually, patients are asked to fill out any supporting documents needed for that visit before starting the virtual appointment. The insurance information is verified, and any copayment due at the time is made before the appointment. If it is a new patient appointment, the provider goes over the past medical history, history of presenting illness, possible vital signs the patient may have recorded at home, and chief complaint. There are no wait times except if another patient's appointment is taking longer than expected. Regarding follow-up appointments, after each appointment, a "recall" message was automatically generated if the patient requires a follow-up appointment.

The clinic provides primary care services. In collaboration with Quest Lab and Diagnostics and LabCorp, the patients are sent to obtain ordered lab tests. The clinic also provides prescription renewal and referral services. One of the issues identified is patients not completing their ordered pre-visit lab appointments. When diagnostic tests are ordered for patients, such as colonoscopies, x-rays, and mammograms, the order form is filled out electronically. Prior to the end of their visit, the provider verbally notifies the patient of the ordered labs and asks the patient to go to the site where the order form has been sent to complete the lab or diagnostic test. After this, the patients are not sent reminders to obtain the labs or complete diagnostic tests.

Patterns

The interactions between patients, professionals, and processes form patterns within the microsystem. According to the Institute for Excellence in Health and Social Systems (n.d.), designs include social and cultural behaviors of individuals and the organization, communication practices, relationships within and between microsystems, and outcomes. The microsystem functions can be assessed by identifying unacknowledged patterns and measuring results. The current COVID-19 pandemic has disrupted the clinic's standard operational patterns. This clinic operates only virtually and has identified several benefits and areas of needed improvements due to the current pandemic. One of the benefits identified was that there were no wait times for patients compared to in-person visits. New patient appointments were scheduled at 45-minute intervals, while follow-up appointments were scheduled at 15-minute intervals. Patients were very pleased with the time frame of their appointments. However, one of the disadvantages noted was the inability to perform detailed physical appointments.

Setting/Population

It's critical to examine the organization where the planned change will be implemented before starting a project. Bronfenbrenner's ecological model, a framework used to understand organization system relationships, includes a micro, meso, and macrosystem (VélezAgosto et al., 2017). These systems are all interrelated and combined; they explain the dynamics of the organization as a whole and how patients are affected by each method (Vélez-Agosto et al., 2017).

Microsystem

The targeted microsystem is a primary care clinic. Currently, the clinic operates virtually and has plans to open up in-person visits by the fall of 2022. The clinic will contain a front desk

waiting area, three examination rooms, and an office when the clinic opens. Clinic hours vary depending on the day of the week. On Mondays, Wednesdays, and Fridays, the clinic is open for 9 hours, from 8 a.m. to 5 p.m.

Meanwhile, it is open for 11 hours on Tuesdays and Thursdays—from 8 a.m. to 7 p.m. Also, they are available from 9 am to 1 pm on Saturdays. The top diagnosis treated at this clinic includes hypertension, diabetes, hypothyroidism, and vitamin and D deficiency. Although the clinic is still growing, they utilize a collaborative approach to achieve patient outcomes. The provider, who is also certified, specializes in primary care.

SWOT Analysis

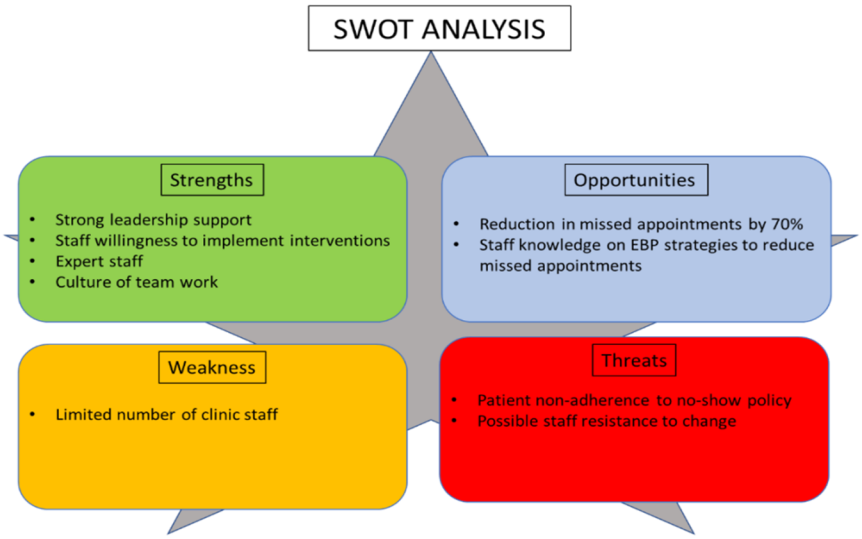
Organizations use the strengths, weaknesses, opportunities, and threats (SWOT) analysis to find challenges and generate solutions that may be used to overcome any obstacles during the adoption of a proposed intervention (Misbah & Mahboob, 2017). A SWOT analysis was performed, revealing several strengths of this practice, including excellent leadership, expert staff, a culture of teamwork, and willingness to implement interventions. This intervention may be challenging to implement due to the limited clinic staff. The staff's opposition to change and the patient’s non-adherence to the no-show policy are threats to this process.

Readiness for Change Assessment

In October 2021, a needs assessment was conducted which showed that the clinic was ready to implement the proposed interventions. The clinic’s director was interviewed using the Robert Wood Foundation Practice Improving Capacity Rating scale and the practice improvement capacity rating scale was used to rate readiness for change. Identify how to best structure consultation support for ambulatory practices that are ready to conduct quality improvement (QI) activities.

Figure 1

Strengths Opportunities Weakness Threats (SWOT) Analysis



Note. From *Origins of Swot Analysis*, by R.W. Puyt, F.B. Lie, F.J. de Graaf, and C.P.M. Wilderom, 2020, Academy of Management (https://doi.org/10.5465/AMBPP.2020.132). In the public domain.

The rating scale answers a crucial question for practice supervisors and those in charge of putting practice training systems in place. The scale answers the question of how the practice utilizes limited mentoring tools strategically to enhance the impact of a QI project (Robert Wood Johnson Foundation, 2014). The scale categorizes clinics' readiness as either red, yellow, or green. The red signifies that the practice is not ready for QI implementation while the green signifies that the clinic is ready for implementation of a QI project. Each scored criterion contained questions in relation to commitment of leadership, financial resources, provider and administrative support, communication, access to infrastructure, prior QI project experience, and IT support. After conducting the interview, the clinic's score fell under the "green" criteria.

Project Identification

Purpose

The purpose of this project is to improve the timely management of care for patients with hypertension through the implementation of a new appointment reminder process and policy addressing missed appointments in a primary care clinic. The global aim of this project is to improve processes and systems related to missed, follow-up appointments, and referral care to allow for effective provider management of patients with hypertension.

Objectives/Anticipated Outcomes

1. By the end of the intervention period, 100% of patients requiring a follow-up appointment will schedule one prior to the end of the current appointment.
2. There will be a decrease in the rate of missed follow-up appointments from 16% to 5% by July 1st, 2022.
3. By the end of the intervention period, 100% of all cancellations are rescheduled within 2 weeks of their original appointment date.
4. By the end of the intervention period, 100% of patients with ordered pre-visit labs will receive a text reminder of their lab appointment 1 week prior to their next scheduled appointment.
5. By the end of the intervention period, completion of pre-visit labs prior to follow-up appointments will increase by 25%.
6. By the end of the intervention period, 100% of patients with hypertension will receive education on the proper BP measuring techniques.
7. There will be a reduction in BP by 10/5mmHg in all patients with hypertension during the 3month intervention period.

Strength of Evidence

A literature search was completed using CINAHL, Cochrane, PubMed, and Google scholar. Search terms and associated keywords included: “Follow-up,” “appointments,” “appointment scheduling,” “missed appointments,” “scheduling,” “appointment delays,” and “appointment compliance.” A literature review was performed to identify evidence addressing methods to improve follow-up appointments. Before conducting the literature search, articles selected for inclusion were randomized control trials and systematic reviews. Only peer-reviewed articles from 2016 to 2021 written in English were included.

A total of 187 articles were identified through the database searches. After removing duplicates and irrelevant articles based on their title, 106 articles remained. An abstract evaluation was performed on the remaining 106 articles using the inclusion/exclusion criteria; another 69 articles were excluded because they did not include the initial search term keywords used. A full-text review was performed on the remaining 37 articles, and a total of 15 were selected to be included in the literature review based on their level of evidence and the inclusion of the specified keywords. These articles were comprised of randomized control trials to descriptive studies.

Results

Out of the fifteen included articles, three were randomized control trials, six retrospective and prospective studies combined, then chart reviews. The studies assessed ways to improve follow-up and missed appointments. Teo et al. (2021) interviewed 27 veterans on the effectiveness of appointment letter messaging systems. After implementation, it was found that four patients with prior scheduled appointments had a low no-show rate (1%–10%), seven had a moderate no-show rate, and the other seven had a high no-show rate (above 20%). Thiel et al.

(2017) also conducted a similar study where they implemented a message and e-mail reminder system in a family planning clinic. The results showed a significant decrease of 4% in the number of no-shows after implementation.

Meanwhile, other studies examined the issues related to the characteristics of patients who are likely to miss appointments. Such characteristics include socioeconomic status, age, ethnicity, and insurance (Agarwal et al., 2021; Alnasser et al., 2020; Davies et al. 2016; Ellis et al., 2017; Kheirkhah 2016; Lu et al., 2017; Miller-Matero et al., 2016) Another study by Steiner et al. (2016) explains joint initiatives to minimize missed appointments using an interactive voice response and text message (IVR-T) intervention. The results showed that several texts or call reminder notifications were more helpful than one reminder in decreasing the number of missed primary care appointments, especially in high-risk patients.

Laboratory Testing

For decades, laboratory testing has been an essential part of the healthcare system (Sikaris, 2017). Several claims have been made that measurable laboratory data plays a role in about 70% of critical care and management decisions (CDC, 2018). Efficient utilization of lab data can influence outcomes in managing diseases (Sikaris, 2017). Pre-visit laboratory testing is essential for early diagnosis, detection of disease, and initiation of treatment therapy (Maillet et al., 2018). When patients stay up to date with lab testing, providers may be able to respond quickly with preventative treatment, thereby preventing further decline in health status (Maillet et al., 2018). When patients miss their scheduled lab appointments, progress in managing health may become halted (Maillet et al., 2018). Patients whose medication adjustments are dependent on updated lab results (ex. Hypothyroidism) may experience a decline in health status if they miss their appointment (Maillet et al., 2018). Therefore, appropriate reminder systems are crucial

to assist patients in keeping up with lab appointments.

Reminder Systems

The Agency for Healthcare Research and Quality (AHRQ) recognizes the importance of follow- up appointments and lists several ways providers can assist patients in meeting up with appointments (AHRQ, 2020). Patients are often notified of their appointment some days prior to their scheduled appointment by reminder systems (AHRQ, 2020). Meanwhile, patients who have missed or canceled appointments are contacted by recall systems and encouraged to reschedule. Efficient communication is critical to the successful functioning of any practice. That's why an inclusive appointment reminder system is necessary to manage no-shows and follow-up appointment notices (AHRQ, 2020).

Text Messaging Systems

According to a study conducted by Steiner et al. (2016), the best outcomes in reducing no-show rates were achieved by combining different patient reminder approaches. The researchers also discovered that providers should be aware of missed appointment rates and actively engage in patient education (Steiner et al., 2016). Patients should be able to cancel appointments that are simple and permit little contribution from them, such as automated responses to text messages instead of having them call telephone the clinic and wait for someone to respond or leave a message (McLean et al., 2014).

Phone Calls

A follow-up call to the patient is another approach demonstrated to improve missed appointment rates. Penzias et al. (2019) analyzed two intervention plans devised to lower missed appointment rates. The first one was initiating individualized phone call reminders before appointments (Penzias et al., 2019). The second analyzed why patients failed to meet up with

appointments (Penzias et al., 2019). The study found that about 39% of the patients forgot about their appointment (Penzias et al., 2019). The findings of this suggest that focused interventions, like tailored reminder calls, can help these practices reduce missed appointment rates (Penzias et al., 2019). It's essential to determine why patients fail to attend scheduled visits. Patients who do not maintain their appointments have been proven to have a variety of setbacks and reasons, including a lack of transportation, severe disability, socioeconomic struggles, as well as a worry that they may be reprimanded for disobeying a provider's advice (Alnasser et al., 2020).

Methods

Project Intervention

The intervention plan included these steps:

1. A new policy for missed appointments was developed between the provider, the DNP student, and the health care team.
2. Patients who did not have a preferred means of contact in the EHR were asked to provide one—either through a phone call, email, or text message which was registered in their account.
3. All patients received at least one reminder of their appointment via text or phone call 1 week and again 2 days prior to their follow-up appointment date.
4. When labs were ordered, an automated reminder message was sent immediately after the patient checked out. Three days before the next appointment, an automated text message was sent asking the patient to type a “YES” or “NO” confirming if the lab work has been done.
5. Data was collected weekly regarding the number of missed appointments each day, tracking if those that were missed were rescheduled within the allotted time frame, and

tracking the number of these appointments that were follow-ups versus regularly scheduled appointments.

6. Patients were taught proper BP measuring techniques, they were asked to keep a log of their daily BP, and to bring it with them during their next appointment or send the consecutive log to the clinic's email provided. During their next appointment, the provider reviewed their BP log which was sent to the clinic's email provided, then, he made appropriate changes to their plan of care.
7. Data was collected on all patients with hypertension at the start of the project with scheduled appointments and follow-up appointments scheduled thereafter to compare their BP values over the 15-week implementation period.

Steps for Implementation

This quality improvement (QI) project lasted for 4 months, from February 2022 through July 2022. The provider, medical assistant, and front desk personnel were called to participate in this project. The planning phase began in September 2021; at this time, a meeting was set up with the clinic's director to discuss the anticipated needs of the clinic related to the project. Next, another virtual introductory meeting introduced the EBP project to the director. A quick overview of the processes was presented to clarify the project's goal. Following that, concerns from the director were answered. The clinic's director, who also served as the project's onsite supervisor, sent out emails to the medical assistant and front desk personnel providing a brief overview of the proposal. An organization readiness assessment was completed, and it showed that the clinic was ready for the implementation of this QI project.

In March of 2022, a meeting was scheduled with the clinic's EHR software provider to discuss plans to expand the reminder messaging system. Also, a new no-show policy was

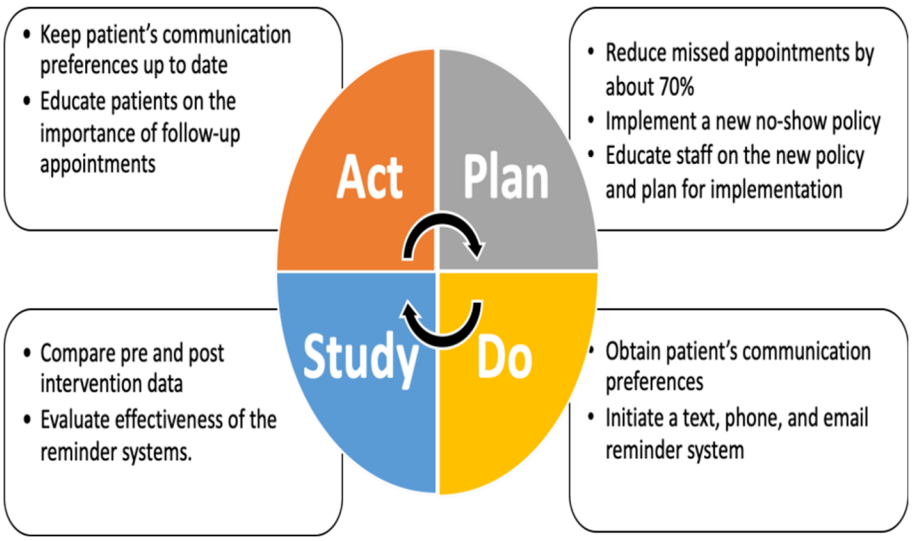
developed in collaboration with the clinic's director. Planned interventions began in February 2022 and continued until July 2022. The pre-intervention data was compared to the post-intervention to determine the specific aim of this EBP project, which is to reduce the missed appointment rate from 16 percent to 5 percent and improve the care of patients with hypertension by a reduction of 10/5mmHg in BP. Weekly meetings were set up with the clinic staff to review the detailed plan for intervention, data collection, and evaluation.

Model for Improvement

The Plan-Do-Study-Act (PDSA) is a tool used to determine whether improvements can result from a proposed change. The steps include the planning phase, where objectives are clearly stated, and the change plan is displayed. The second phase involves implanting the change. The third phase consists of evaluating data after the change has been implemented, and the last step requires remodification of the evaluated change. This project aims to reduce missed appointments by approximately 70 percent.

Figure 2

Plan Do Study Act (PDSA)



Note. From *Health literacy universal precautions toolkit, 2nd edition: plan-do-study- act (PDSA) directions and examples,* by Agency for Healthcare Research and Quality, 2020, AHRQ. (https://www.ahrq.gov/health- literacy/improve/precautions/tool2b.html). In the public domain.

Barriers and Facilitators

Some of the barriers faced are that the clinic is currently only offering virtual services until they open to in-person services in the fall of 2022, patients' lack of compliance to responding to text reminder messages, lack of access to blood pressure monitoring devices, and patients forgetting to take a log of their blood pressure. One of the main facilitators is strong leadership support. The director of the clinic who is also the sole provider was always available to answer questions and provide feedback on the progress of the project, including the assessment through the implementation and collection of data and results. Additionally, the entire clinic team was very supportive of the project. The EHR provider was contacted on numerous occasions to discuss the implementation of the text reminder system, and each time, they addressed the issue and made further suggestions for improvement of the patient's portal.

Change Team

The change team's essential stakeholders and participants must be selected to enact a successful EBP project. Early acceptance, a basis for a successful EBP project implementation, can be achieved by engaging the key stakeholders and gaining their support. Stakeholders identified for this project include the clinic's director, the sole provider, the medical assistant, and the front desk personnel. The EHR support staff was also identified as part of the change team. The clinic's director has shown support for the project from its onset. A letter of support was written (Appendix A).

Ethical Considerations

Quality Improvement (QI) projects have been linked to improved patient and healthcare outcomes (Katakam & Suresh, 2017). This is done by integrating professional experience, patient values, and up-to-date scientific data (Katakam & Suresh, 2017). Ethical oversight is essential in clinical intervention activities to mitigate any ethical issues that may arise (Coleman, 2019). Approval for the project was obtained from the clinic director before commencement, and a confidentiality agreement was signed. Authorization to perform this project was sought from the University of the Incarnate Word Institutional Review Board (IRB) and the project was deemed non-regulated research, essentially a quality improvement (QI) project.

One of the primary ethical considerations that may come up during the implementation of this project may be regarding patients' health information privacy and confidentiality, which would fall under the ethical principle of non-maleficence. This entails not causing harm to patients (Phillips, 2015). Therefore, healthcare workers have an ethical and legal commitment to maintain health information and data confidentiality (Phillips, 2015). To prevent privacy intrusions, electronic records and connected systems are monitored and safeguarded (Phillips, 2015). Participation in this project does not pose any risk to the patients. No patient identifiers were obtained during the assessment. Demographic data were obtained through the clinic's secured EHR system and stored in a password-encrypted file on a secure computer to which only the DNP student had access.

Evaluation Plan

The process measurements, which comprise the following, were measured and evaluated in this project:

Objective 1: 100% of patients requiring a follow-up appointment will schedule one prior

to the ending of the current appointment. This was measured through a weekly review of the patient's appointment calendar in the EHR.

Objective 2: There will be a decrease in the rate of missed follow-up appointments from 16% to 5% by July 1st, 2022. This was measured using a retrospective chart review each week—looking at the number of patients lost to follow-up after interventions compared to how many were supposed to be scheduled overall.

Objective 3: 100% of all cancellations are rescheduled within 2 weeks of their original appointment date. This was measured through a weekly chart review of scheduled appointments.

Objective 4: 100% of patients with ordered pre-visit labs will receive a text reminder of their lab appointment 1 week prior to their next scheduled appointment. This was measured through a weekly review of the EHR "recall" system which keeps track of reminders sent to patients.

Objective 5: Completion of pre-visit labs prior to follow-up appointments will increase from 55% to 80% during the intervention period. This was measured through a retrospective chart review of completed ordered pre-visit labs.

Objective 6: 100% of patients with hypertension will receive education on the proper BP measuring techniques. This was measured through a weekly review of provider documentation of patient education in the EHR.

Objective 7: There will be a reduction in BP by 10/5mmHg in all patients with hypertension during the 3-month intervention period. This was measured through a retrospective chart review of documented BP in the EHR after the intervention.

Results

Fifty-four women (60%) and 36 men (40%) with ages ranging from 21 to 75 years made up the majority of the participants. Forty-six percent of the participants had a primary diagnosis of hypertension, and more than 90 percent had at least a secondary diagnosis including arthritis, chronic kidney disease, coronary artery disease, diabetes mellitus, hypothyroidism, hyperlipidemia, depression, and anxiety. All the participants with hypertension were prescribed at least one antihypertensive medication.

Objective 1: 100% of patients requiring a follow-up appointment will schedule one prior to the ending of the current appointment.

Results: During the project intervention period from (February 2022 to July 2022), there were about 90 scheduled appointments out of which 63 (70%) of them required a follow-up appointment. Among these patients requiring a follow-up, 52 (83%) of them scheduled a follow-up appointment prior to ending their current appointment while 8% scheduled their appointment after their current appointment was concluded.

Objective 2: There will be a decrease in the rate of missed follow-up appointments from 16% to 5% by July 1st, 2022.

Results: Out of the 63 patients who required a follow-up appointment, 57 (91%) of them had one scheduled. As seen in Figure 3, most of the follow-up appointments were scheduled between the months of May through September 2022 with the majority of them (42%) scheduled in the month of June, 23% in May, and 35% in July, respectively. The number of missed appointments in the months of May through July were 2 (23%), 3 (13%), and 2 (10%), in that order.

Objective 3: 100% of all cancellations are rescheduled within 2 weeks of their original

appointment date.

Results: Among the 90 scheduled appointments, eighteen (20%) were canceled. Thirteen (72%) of the canceled appointments were rescheduled within 2 weeks, and three (17%) of them were rescheduled after 2 weeks.

Objective 4: 100% of patients with ordered pre-visit labs will receive a text reminder of their lab appointment 1 week prior to their next scheduled appointment.

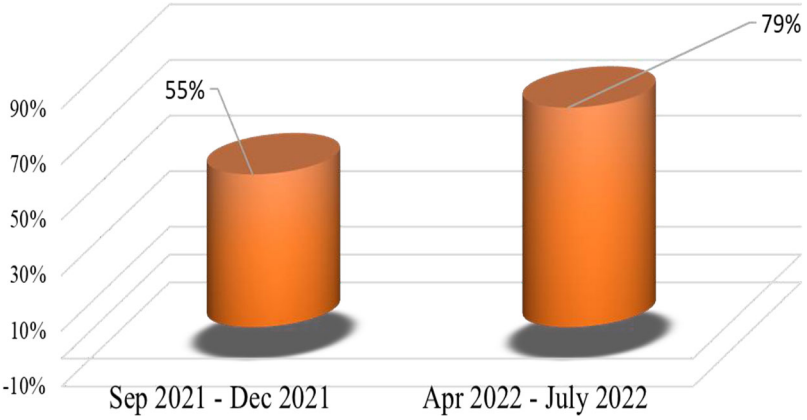
Results: Pre-visit lab work including mammograms and colonoscopies were ordered for approximately 33 (37%) of the patients. Automated text reminders were sent to 28 (85%) of them who had labs and other referrals within a week before their next scheduled appointment and 15% (5 out of 33) did not receive text reminders.

Objective 5: Completion of pre-visit labs prior to follow-up appointments will increase from 55% to 80% during the intervention period.

Results: Automated text reminders were sent to the 33 patients who needed labs or referrals completed. As shown in Figure 3., 26 (79%) completed the ordered labs and referrals.

Figure 3

Completion of Pre-Visit Labs Pre- and Post-Implementation



Objective 6: 100% of patients with hypertension will receive education on the proper BP

measuring techniques.

Results: Education provided to the patients were recorded in the EHR. Among the 41 out of 90 (46%) patients who had a diagnosis of hypertension, 39 (95%) of them received education on proper BP measuring techniques.

Objective 7: There will be a reduction in BP by 10/5mmHg in all patients with hypertension during the 3-month intervention period.

Results: Among the 41 patients with a primary diagnosis of hypertension, 26 (64%) of them had a blood pressure monitor ordered by the provider and sent to them through their insurance, the other patients did not have insurance and thereby opted to self-purchase one. Twenty-two (54%) patients presented to their appointment with their BP logs. With the logs presented, 9 (41%) of the patients had changes made to their medications and plan of care. As seen in Table 1. Six (67%) of patients who had medication changes were scheduled for follow-up appointments during the intervention period. There was a notable reduction in mean systolic BP by 9 mmHg (147.5 mmHg to 138.6 mmHg) and diastolic BP by 4 mmHg (84.7 mmHg to 81 mmHg).

Discussion

Hypertension Management

Prior to the intervention period, some patients with hypertension either had zero access to BP monitoring devices or did not know how to use them properly. The clinic's provider educated 95% of the patients with hypertension patients on the proper ways and techniques to measure BP outside of the clinic following the AHA guidelines. The goal to have 100 percent of patients educated was unmet because there was no documentation in the electronic health record (EHR) on the patients who may have received education during the beginning of the intervention period.

Table 1.

Blood Pressure Readings Pre- and Post-Intervention

Patient ID	Pre-SBP (mmHg)	Pre-DBP (mmHg)	Post-SBP (mmHg)	Post-DBP (mmHg)
1	148	79	143	77
2	149	84	139	82
3	139	85	129	80
4	154	94	142	88
5	149	86	138	82
6	146	80	141	77
Mean	147.5	84.7	138.6	81

Note. These patients were seen during a 3-month follow-up visit.

A template in the EHR containing a statement noting education on proper BP measuring techniques and lifestyle modifications was then created by the provider. This allowed the provider to automatically incorporate documentation into the EHR on the education discussed with patients during their visit. Included in the education was a discussion on lifestyle modifications such as exercise, incorporation of a healthy diet, and smoking cessation. The provider acknowledged greater confidence in modifying medications and plan of care after patients presented to their appointment with their BP logs. The American Heart Association (AHA) report on the diagnosis and management of hypertension, stated that diagnosis has relied heavily on office-based blood pressure (BP) measurements (Shimbo et al., 2020). Blood pressure may vary significantly when monitored in the office versus when monitored outside of the clinic, and an elevated out-of-office is independently linked to elevated cardiovascular events (Shimbo et al., 2020). Therefore, the AHA recommends that blood pressure monitoring outside the office

setting is a valid and reliable method for BP measurement (Shimbo et al., 2020).

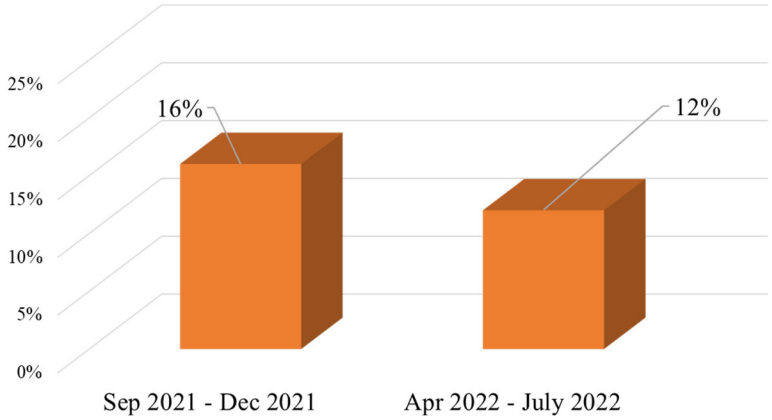
Among the patients with hypertension who did not have a BP monitor, 64% of them were ordered one through their insurance. The anticipated goal for the reduction in overall BP was achieved. There was a significant decrease in both the systolic and diastolic blood pressures by 9/4 in all the patients who had follow-up appointments even though this was accomplished over a very short timeframe. It is hopeful that a further reduction would be noted with more time. This significant change was possible due to the collaboration between the patients and the providers among those who presented to appointments with their blood pressure logs.

Missed Appointments

This project aimed to improve processes and systems related to missed, follow-up appointments, and referral care to allow for effective provider management of patients with hypertension through the implementation of an appointment reminder process and policy addressing missed appointments. The overall rate of missed appointments in the clinic decreased from 16% to 12% during the 19-week intervention period and 72% of canceled appointments were rescheduled within 2 weeks of their original appointment. As shown in Figure 4, while the goal to decrease missed appointments from the previous 16% to 5% by the end of the intervention period was not met, there was a notable decrease of 4% during this limited time period. The rationalization of this unmet goal is partly related to the short intervention timeframe as an accurate rate of missed follow-up appointments could not be properly estimated. Another reason that this goal was not achieved may be due to the uncontrollable patient life events that may have contributed to patients missing appointments despite the implementation of the reminder systems.

Figure 4

Change in the Number of Missed Appointments Pre- & Post-Intervention



Ullah et al. (2018) surveyed 218 patients who missed their primary care appointments. A substantial percentage (38%) of them reported missing their appointments because they forgot they had an appointment or there was no reminder sent to them. Meanwhile, 7% stated transportation issues. Although, at this clinic, the issue of transportation would not have been a contributing factor to patients missing their appointments since all of the patient appointments were held virtually. Morris (2020) describes some of the benefits of virtual appointments, mentioning that virtual appointments hold opportunities for reducing primary care missed appointments by permitting patients to meet up with their providers remotely through interactive multimedia programs (Morris, 2020). In addition, participation in virtual visits will provide convenience to patients from anywhere, such as in their living spaces and worksites, thereby reducing the stresses associated with attending appointments in person (Morris, 2020). Furthermore, patients' preference for virtual appointments may be strengthened due to greater access to confidentiality when discussing conceivably difficult issues (Morris, 2020).

Reminder Systems

Implementation of the new reminder system to include text message reminders and phone calls were sent 1 week and again 2 days prior to their follow-up appointment date. When labs and referrals were ordered, an automated reminder message was sent immediately after the patient checked out. Three days before the next appointment, an automated text message was sent asking the patient to type a response confirming if the pre-visit lab or referral has been completed. Among ninety patients seen from February 2022 to July 2022, thirty-three patients (37%) required labs or referrals, 28 (85%) of them received automated text reminders, and 26 (79%) of them completed their pre-visit labs and referrals. The goal to have 100% of patients who require labs and referrals receive text reminders were unmet partly due to a system error where the automated text was not initiated 1 week prior to their scheduled appointment. This error occurred several times towards the beginning of the intervention period in March, then, in subsequent months, the error was corrected after meeting with the EHR provider. Another obstacle faced was that upon review of the patient's contact information located in the EHR, it was noted that among the patients that were supposed to receive the text reminders, a small percentage listed a landline phone number which was unable to receive text messages. This issue could be addressed if a system with automated phone messages was in place and personnel at the clinic was available to follow up on these patients.

The challenges and opportunities of implementing a new reminder system were comparable to those described in the literature. Tan et al. (2017) introduced a text appointment reminder system that aimed to reduce the number of missed appointment referrals at a clinic. Implementation of this new text message reminder allowed for a decrease in the overall missed referral appointment rate by forty-three percent, while the missed appointment rate of patients

with follow-up appointments decreased by 44% (Tan et al., 2017).

Limitations

This project did not focus on certain barriers patients may face in attending appointments such as severe disability, language barriers, socioeconomic struggles, and other life events. One major limitation was the absence of information on the causes of the missed appointments. This would have been valuable in figuring out solutions to remove those barriers. Some of the limitations observed include decreased patient access to BP monitors. Regarding keeping BP logs, most patients did not send their BP logs to the email provided, instead, the log was presented by the patient to the provider on the day of the scheduled appointment. The AHA recommends that blood pressure measurements should be printed or transmitted digitally to healthcare providers for the sake of improved record keeping (Shimbo et al., 2020). Although the overall process of keeping a BP log was deemed satisfactory by the provider and some of the patients during their appointment, some of the other patients report that the reason for not keeping a log of their BP was that they simply forget, meanwhile, others stated that it was too tasking. Recommendations on how to resolve these concerns by patients involve open communication between the provider and the patients (Shimbo et al., 2020). Having a collaborative discussion with the patient will allow them to understand the importance and implications of keeping a BP log and will give the provider an idea of diverse ways to manage the patient's plan of care (Shimbo et al., 2020).

Out-of-office blood pressure monitoring is crucial for the prevention and management of hypertension and other cardiovascular risk factors (Shimbo et al., 2020). To achieve positive outcomes, however, self-monitoring of blood pressure necessitates a system of education and awareness between the patient and provider (Shimbo et al., 2020). The transition from office-

based blood pressure monitoring to a plan that involves monitoring BP at home is not devoid of existing and perceived obstacles (Shimbo et al., 2020). Such obstacles may emerge from patients' worries and assumptions, the providers' values, and opinions, or inadequate resources from health systems, including access to health insurance (Shimbo et al., 2020).

Due to the short timeframe of this project implementation, patients with hypertension who were scheduled for follow-up appointments in the months of July through September were not included in the results. The majority of patients with hypertension had follow-up appointments scheduled between a 3 and 6-month period. Therefore, data on the patients who were scheduled after the intervention period—which lasted about 19 weeks, was not obtained and did not contribute to the overall goal of reducing the total BP by 10/5 mmHg. This thereby limited the sample size which affected the overall goal.

Another barrier faced during this project implementation was the limited nature of virtual visits which did not provide an opportunity for comparison of patients' home BPs against the ones taken in-office. Although, the AHA guidelines on the management of hypertension suggest that out-of-office BP monitoring can be sufficient in managing patients with hypertension (Shimbo et al., 2020). Virtual appointments are not an all-encompassing remedy for missed appointments. Access to digital technologies can be an issue for patients from low socioeconomic backgrounds, and those who may be dealing with some form of sensory impairment (Morris, 2020). It may also be challenging for those patients who are unable to access private rooms for personal discussions with their providers (Morris, 2020). Data security and digital privacy may also be of concern for patients who feel that virtual appointments may not satisfactorily address their needs and may require in-person appointments (Morris, 2020).

Recommendations

Some other populations that could benefit from the implementation of this project are patients at an increased risk for HTN. These patients have not been diagnosed with HTN, but they had multiple risk factors and other chronic conditions such as coronary arteriosclerosis, diabetes mellitus, atrial fibrillation, and chronic kidney disease. This group of patients could benefit from education on blood pressure monitoring and adherence to follow-up appointments in order to better manage these chronic illnesses. To continue the implementation of this project, the clinic would have to continue incorporating reminders and educating patients with hypertension on the importance and the impact of proper BP monitoring on their overall health. Regarding patient follow-up and the management of hypertension, there is still much progress to be made. Chronic hypertension necessitates healthcare partnerships, to include integrated and multifaceted methods (Shimbo et al., 2020). These methods will involve identifying emerging innovations in technology and utilizing evidence-based studies and practices to help motivate patients, team members, and the healthcare team to promote health and wellbeing (Shimbo et al., 2020).

According to the AHA, individuals typically monitor their own blood pressure through the use of an oscillometer device (Shimbo et al., 2020). Out-of-office BP monitoring devices for the upper arm that is used to measure the blood pressure in the brachial artery are recommended over the ones used on the wrist (Shimbo et al., 2020). Several wrist BP monitoring devices have been tested and affirmed, but a large portion of recommendations and scholarly references do not advise their frequent use due to the increased possibility of positioning-related mistakes (Shimbo et al., 2020). Blood pressure measurements should be printed or transmitted digitally to healthcare providers (Shimbo et al., 2020). Now, readily accessible, are blood pressure (BP)

measuring devices that have the capacity to remotely send data to smartphone applications (Shimbo et al., 2020). Transferring data from such software directly into the EHR patient portal is an emerging method for BP evaluation (Shimbo et al., 2020). This means that the information will be more accessible to the care team, thereby facilitating more efficient management of hypertension (Shimbo et al., 2020).

This project did not focus on the cost of and possibly increased reimbursement for the clinic following the decrease in the number of missed appointments. In addition, DNP- prepared nurse practitioners are in a unique position to improve population health and wellness among patients with chronic diseases.

Sustainability

This project will help improve health outcomes, assist patients in learning more about their disease process, and allow for better monitoring of patient's health status. The clinic EHR includes a section where education on hypertension is provided to the patient and reminders systems have been embedded in the EHR. Appointment rescheduling has been seen as a positive consequence, particularly when the patient's medical needs are critical. This project will continue to aid in assessing and addressing the issues and shortcomings such as the ones seen with missed appointments within the healthcare system. The knowledge and limited time of those who provide patient care constitute a highly valuable asset in the field of health care. Hence, it is crucial that there is a proper structure in the way care is provided to patients. Considering this, a project such as this will help provide a better understanding of the effects of missed appointments in caring for patients with chronic health issues and ways to mitigate them.

The sustainability of this project is closely related to the strong provider buy-in and contributions to the success in achieving the overall goal of this project. As technologies and

improvements in virtual visits evolve over time, it is essential that healthcare providers continually assess the efficacy of appointment reminders to reduce missed appointments and improve follow-up in order to better manage the care of patients with chronic health conditions such as hypertension. This project's results may be utilized as a basis of reference when seeking to increase follow-up appointments in a bid to accomplish a wide range of objectives, such as enhancing clinical health outcomes, along with patient and provider satisfaction.

Implications for Practice

Accessibility and adaptability are essential because the current culture seems to demand access to care the same way it wants everything else—quick, available, and flexible. Furthermore, appointment scheduling should be made simple by incorporating enhanced self-scheduling systems. In the current society, same-day appointment availability and scheduling are essential due to the busy lifestyle that has been incorporated into society. People may prefer having appointments and other tasks completed on their time. An implication of not having openings for same-day scheduling is that patients may decide to go to an emergency or urgent care center for care that can be provided at the primary care clinic (Carmel et al., 2017).

The incorporation of out-of-office BP monitoring in the primary care clinic was advantageous for assisting providers in determining the health status of their patients with hypertension. Several patients benefited from additional patient engagement and education in the management of their plan of care. Consequently, over fifty percent of the patients with hypertension presented to their appointment with their BP log and were able to collaborate with the provider in managing their care and saw improvements in their blood pressure. To ensure the efficiency of hypertension care management in primary care clinics, it is apparent that a broader, more diverse strategy that addresses all aspects of the patient care system must be implemented.

In all, the importance of adequate scheduling to reduce missed appointments and improve follow-up in patients with hypertension cannot be overemphasized. This project's findings may help create a culture of continuous improvement and better monitoring of patients' health status by empowering providers to adequately care for their patients with hypertension. In collaboration with the healthcare team, DNP-prepared nurse practitioners can address those issues that are pertinent to enhancing follow-up appointments among patients with hypertension in order to improve patient care outcomes.

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Appendix A

Encino Park Family Health & Wellness Clinic

Letter of Support

1/7/2022

To whom it may concern:

On behalf of Encino Park Family Health and Wellness clinic, I am writing to grant Victoria Idubor), a DNP student at the University of Incarnate Word, permission to conduct her DNP project, "Improving Follow-up Appointments in a Primary Care Clinic."

I understand that Victoria will engage staff and other stakeholders during this process. She will also be conducting chart reviews, interviews, and educational events at my clinic from September 2021-August 2022. We are glad to participate in this DNP project and contribute to this vital work. Therefore, as the director of Encino Park Clinic, I agree that Victoria Idubor's DNP project may be conducted at our clinic.

Feel free to contact me at jleal@encinofamilyhealth.com or (210) 568-5816.

Sincerely,

Dr. John Leal DNP, APRN, FNP-C