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Interdisciplinary Medication Reconciliation Approach for Arabic-Speaking Patients

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Abstract

Problem: Limited English Proficiency (LEP), which includes Arabic speakers, presents challenges in healthcare and can impact medication reconciliation and adherence.

Interdisciplinary collaboration involving patients and interpreters is crucial for improving medication reconciliation and adherence. This project aimed to examine the impact of an interdisciplinary medication reconciliation approach on medication adherence with Arabic-speaking patients ages 18-99 over three months.

Methods: This quality improvement (QI) pilot project utilized a descriptive cohort design. A translated validated Morisky, Green, and Levine (MGL) adherence survey consisting of four questions was administered pre- and post-implementation to a convenience sample of Arabic-speaking patients 18 years or older but under 99 years old, prescribed two or more medications and had an in-person interpreter. Data collected included demographic data, patient surveys, the number of medications prescribed, and interventions recommended by pharmacists.

Results: There were ($N=29$) who participated in completing the initial survey, there were ($n=15$; 52%) who did not meet with the pharmacist for initial medication reconciliation, ($n=14$; 48%) completed the initial medication reconciliation with the pharmacist; ($n=9$, 64%) patients met with the pharmacist and completed a medication reconciliation visit but did not come back for a follow-up and to complete the post-survey, ($n=5$; 17%) returned for a one-month follow-up visit. The number of medications pre-reconciliation ($n=5$) ($M=18.80$; $SD= 6.140$) and the number of medications post-reconciliation ($M=16.40$; $SD =6.025$) decreased by 2.40. Interventions provided by the pharmacist included medication education, medication changes, pillboxes, and refill support. The

MGL survey resulted in a (*p-value* = .248). This result may be due to the small sample size.

Implications for Practice: Early identification of medication reconciliation utilizing an interdisciplinary approach and interventions recommended by a pharmacist could benefit patient education and medication adherence, especially in the LEP population.

Interdisciplinary Medication Reconciliation Approach for Arabic-Speaking Patients

The United States of America (U.S.) is a multicultural society, and with the global migration trends continuing to rise, cultural diversity will increase (McAuliffe & Triandafyllidou, 2021). Approximately 27.1% of people living in the U.S. speak a language other than English at home, and 8.2% speak English less than “very well” (U.S. Census Bureau, 2021). The Limited English Proficiency (LEP) population is limited in the ability to read, write, speak, and understand English; the individual’s primary language is not English, in the U.S. has grown from 23.1 million in 1980 to 67.8 million in 2019 (Dietrich & Hernandez, 2022; LEP, 2011; U.S. Department of Health and Human Services [DHHS], 2023). This growing challenge concerns healthcare professionals when communicating with patients. Therefore, cultural responsiveness is imperative in providing quality care. Immigrants and refugees are at risk for medication non-adherence due to factors such as a communication barrier with their providers, decreased continuity of care, and decreased patient education (Patel et al., 2022). Interdisciplinary collaboration to improve medication reconciliation and adherence is vital (Osterberg & Blaschke, 2005; World Health Organization [WHO], 2003). In multiple systematic reviews and meta-analyses, the impact of pharmacist-led and collaborative interdisciplinary practices was found effective in reducing medication errors (Choi & Kim, 2019; McKennon et al., 2016). This collaborative approach must include the patient to improve health outcomes.

Patients are integral critical members of the interdisciplinary team. Often, LEP patients involve their family when seeking healthcare (Attum et al., 2023), which often include medication reconciliation. Medication reconciliation, which is how a provider

compares what a patient is currently taking to what is prescribed, is a method to help manage a patient's medications (The Joint Commission, 2021a). Medication reconciliation aims to ensure that a patient's medication list is accurate, free of errors or discrepancies, and that medication is being taken as prescribed (Redmond et al., 2018). In the seminal report *To Err Is Human: Building a Safer Health System*, medication errors contribute to increased morbidity and mortality of patients (Institute of Medicine, 2000).

Medication adherence is part of the medication reconciliation process and is defined as the extent to which patients take their medication as prescribed and instructed (Bartlett Ellis et al., 2023; Redmond et al., 2018; WHO, 2003). Medication adherence can be measured by direct observation, blood or urine levels, patient self-reports, rates of prescription refills, patient's clinical signs, and pill counts (Aremu et al., 2022; Cutler et al., 2018; Osterberg & Blaschke, 2005). Medication adherence is a concern that transcends diseases, countries, and cultures. It is important to monitor if a patient is adhering to their prescribed medication regimen because this can result in decreased health outcomes (Aremu et al., 2022). Decreased health outcomes could cost approximately \$100 to \$290 billion annually in the U.S. (Cutler et al., 2018). The WHO, in a seminal report, *Adherence to Long-Term Therapies: Evidence for Action*, identified five factors contributing to medication adherence: health systems, social and economic factors, condition-related factors, therapy-related factors, and patient-related factors (WHO, 2003). LEP patients are at higher risk for adverse health events, increased risk for readmissions, increased risk for falls, and surgical site infections due to communication barriers regarding patient education (Patel et al., 2022; The Joint Commission, 2021b). In

a study conducted by Alzubaidi et al. (2015), 88% of Arabic-speaking refugees were non-adherent with their medication, compared to 45% of English-speaking patients.

Being culturally responsive in addressing medication reconciliation within the Arabic-speaking population, healthcare providers, according to The Centers for Disease Control and Prevention [CDC] (2021), should have the ability of an individual to integrate the knowledge and attitudes of different individuals and communities into a service to produce improved outcomes. In addition, the CDC has identified that cultural competence is a continual process that will evolve (CDC, 2021). Therefore, it is imperative that healthcare providers are continually culturally responsive throughout the medication reconciliation process to the LEP Arabic-speaking population they are serving. Providing culturally responsive care is essential to quality care during medication reconciliation, and an interdisciplinary approach utilizing a pharmacist and interpreter services would enhance positive health outcomes.

Many healthcare professional organizations, namely the American Pharmacist Association [APhA], American Medical Association [AMA], American Academy of Ambulatory Care Nursing [AAACN], and the American Nurses Association [ANA], discuss the importance of culturally congruent care (AAACN, 2023; ANA, 2015; APhA, 2021; AMA, 2022). Nursing organizations have standards that also speak to culturally congruent practices. The AAACN (2023) Standard 17 discusses the importance of cultural humility. As a competency of Standard 17, the AAACN encourages the ambulatory nurse to self-reflect to identify the knowledge, skills, and attitude gaps related to implicit bias and cultural heritage (AAACN, 2023). In 2015, The American Nurses Association (ANA) updated its standards of professional performance to include Standard

8: Culturally Congruent Practice (ANA, 2015). The gaps in cultural competence among healthcare providers can lead to less than excellent patient-centered care (Yehekel & Rawal, 2018). Therefore, healthcare organizations must have programs to identify and address practice gaps around cultural responsiveness. The interdisciplinary approach to healthcare is vital to the patient's quality of care.

The purpose of this quality improvement (QI) pilot project was to examine the effectiveness of an interdisciplinary medication reconciliation approach for Arabic-speaking patients. The Institute of Healthcare Improvement's (IHI) Model served as the framework for this QI project. The aim of this pilot project was to examine the impact of an interdisciplinary medication reconciliation approach on medication adherence with Arabic-speaking patients over three months. The primary outcome of this project was the medication reconciliation appointments with the pharmacist. The secondary outcome was adherence to medication. The question for this study: In Arabic-speaking patients ages 18-99, how does having an interdisciplinary medication reconciliation approach in a primary care practice impact medication adherence over a three-month period?

Review of Literature

Databases, including PubMed, Medline, and APA PsycInfo, were used to conduct a literature search. The key terms and phrases utilized for the search included medication reconciliation, interdisciplinary, health literacy, cultural competence, refugee immigrant, limited English proficiency, and Arabic. Boolean operators used included "medication reconciliation" or "medication management" or "medication review" or "health literacy" AND "interdisciplinary" or "multidisciplinary" OR "pharmacist" or "pharmacy" AND "limited English proficiency" or "English second language" or "refugee" or "immigrant"

or “Arabic” AND “cultural competence” or “cultural humility”. There were 4,791 articles from the initial search. Inclusion and exclusion criteria were applied to narrow the search. Inclusion criteria were peer-reviewed studies from 2018 to 2023 in the English language, published in an academic journal, and including Arabic speaking or LEP and on multiple medications. Exclusion criteria were studies not published in the English language, published prior to 2018, and studies not published in an academic journal, non-Arabic speaking or LEP, not discussing medication. The inclusion and exclusion criteria were set, and 171 articles were generated; 13 were used in this review after they were reviewed for relevance. The literature review focused on medication management within the LEP population. The articles used in this review comprised two cross-sectional studies, six systematic reviews of descriptive studies, and five qualitative studies.

Language barriers can present an added challenge to effective communication when the patient’s and the healthcare provider’s languages do not match (Woods et al., 2022). Language barriers can make the patient feel vulnerable, isolated, frustrated, and unable to communicate effectively, even when using an interpreter (Yehekel & Rawal, 2018). Studies by Gerchow et al. (2021) and Woods et al. (2022) found that language discordance results in LEP patients spending less time with nurses and identified that poor communication between the healthcare team and the patient results in patients not understanding discharge education adequately. According to the U.S. DHHS (2023), an effort is required by law for a healthcare organization to obtain a qualified medical interpreter for LEP patients. When interpreter services are lacking, or a reasonable effort is not made to obtain an interpreter, this can lead to frustration and often patients trying to “get by” with non-verbal communication or insisting for an interpreter to be at their

appointment (Yehekel & Rawal, 2018; U.S. DHHS, 2023). Patient-centered communication will allow LEP patients to be informed and actively participate in their health.

Arabic-speaking patients who have a language barrier are less likely to seek clarification about recommendations or instructions from the providers if their provider speaks English, which can lead to increased medication mismanagement (Miner et al., 2020; Pandey et al., 2021). Additionally, they can struggle with understanding medications, medication instructions, and getting language-concordant prescription materials, which lead to nonadherence to medication treatments (Miner et al., 2020; Patel et al., 2022). The common theme throughout the literature is how language is a barrier to LEP patients and can create a burden when trying to receive quality care (Miner et al., 2020; Pandey et al., 2021; Patel et al. 2022). A provider who can effectively communicate enhances the patient relationship, which is necessary for quality care (Gerchow et al., 2021). Therefore, if a language barrier exists and there is a mismatch in the provider and patient languages, this can cause a decrease in patient/provider relationships (Pandey et al., 2021).

Yehekel and Rawal (2018) performed a scoping review that identified that the lack of continuity can hinder the patient/provider relationship and the patient's experience. The review highlighted that LEP patients disapproved of healthcare providers hurrying through a visit or discouraging questions. Gerchow et al. (2021) posit that due to the language barrier of LEP patients' their medical history was not detailed, and nurses were unsure if health education was understood. Kumra et al. (2020) noted that the organization's cultural competence influences collaboration among the interdisciplinary

team. Patient-centered communication allows for quality time, which impacts the healthcare provider's patient relationship, resonated throughout the above studies (Gerchow et al., 2021; Kumara et al., 2020; Yeheskel & Rawal, 2018).

The experience of any patient can be affected by multiple factors, one of which could be a positive health outcome. The literature has a dearth of routinely studied LEP patient outcomes (Vella et al., 2022). Yeheskel and Rawal (2018) discussed the concern that the LEP population is often excluded from research studies. Despite the lack of studies on health outcomes for the LEP population, a systematic review study by Okoniewski et al. (2022) revealed that culturally sensitive interventions resulted in a positive change in health outcomes. More research surrounding the LEP population is a must to understand and identify how to expand patient health outcomes.

Robinson et al. (2022) emphasized that patients who are part of an ethnic minority community are less likely to have medication reviews with healthcare providers. In the LEP population, specifically the Arabic-speaking community, medication adherence as a patient outcome can be a challenge due to communication barriers, understanding of medications, cultural perceptions (religious or supernatural beliefs), and denial of health conditions (Shahin et al., 2021). In addition, Shahin et al. (2020) suggested that a patient's belief in medication can cause approximately 20% variance in medication adherence. Moreover, Shahin et al. (2020) indicated that cultural beliefs about medications are a factor that can contribute to medication nonadherence, and Miner et al. (2020) noted that LEP patients were less likely to manage their medication independently without ongoing support.

Patient outcomes must include being culturally responsive. Cultural responsiveness is essential when caring for an LEP patient to optimize the efforts to adhere to medication. When providing culturally responsive care, healthcare providers must be mindful that language is an essential aspect of culture as well as family, food, religion, and traditions (Okoniewski et al., 2022; Yeheskel & Rawal, 2018). When providing culturally responsive treatments, each care team member must understand the patient's traditions, which are crucial when considering alternative treatments such as home remedies and supplements (Yekeshel & Rawal, 2018).

Language barriers and patient outcomes are foundational elements that must be considered when striving to provide excellent patient care to LEP Arabic-speaking patients and understanding that employing collaborative interdisciplinary practices to include a pharmacist and interpreter can effectively improve access to care and patient outcomes (Higgins et al., 2019). However, patients can still struggle to make follow-up provider appointments, refill prescriptions, and understand medication instructions (Pandey et al., 2021). Communication is vital; therefore, an interdisciplinary team can help bridge communication (Gerchow et al., 2021).

The Institute of Healthcare Improvement [IHI] Model for Improvement can be used in quality improvement (QI) projects using the Plan-Do-Study-Act (PDSA) to test change (IHI, n.d.a). The PDSA cycle is used in small rapid cycle testing (IHI, n.d.a). It is broken down into four quadrants of a circle: plan, do, study, act, and each of the phases builds on the previous quadrants. During the planning phase, the principal investigator and key stakeholders identified the outcome measures, study question, and the aim of the QI project. The do phase identified patients meeting the inclusion criteria, provided a

survey, collaborated with the interpreter team, and made appointments with the pharmacist for medication reconciliation. The study phases consisted of results and data analysis of medication reconciliation appointments. The act phase incorporated collaborating with the organization regarding the results and recommendations. The PDSA cycle creates opportunities for improvement and change (IHI, n.d.b). This model allows for continuous monitoring of medication appointments with the pharmacist and provides an opportunity to increase medication reconciliation and medication adherence. As mentioned, there is a benefit to conducting an interdisciplinary medication reconciliation with the LEP population, specifically the Arabic-speaking patients. A PDSA cycle during an interdisciplinary medication reconciliation approach to medication adherence was beneficial to understanding how to improve best practices continuously.

As noted in the literature review, multiple factors affect patient health outcomes in the Arabic-speaking population. The themes of communication through a language barrier, healthcare provider and patient relationship, the patient experience related to health outcomes, medication adherence, and the cultural factors that play into high-quality healthcare all affect the patient's health (Gerchow et al., 2021; Higgins et al., 2019; Kumara et al., 2020; Miner et al., 2020; Okoniewski et al., 2022; Pandey et al., 2021; Robinson et al., 2022; Shahin et al., 2020; Shahin et al., 2021; Vella et al., 2022; Woods et al., 2022; Yekeshel & Rawal, 2018). Despite the gaps in the research, studying various cultures and languages, the literature promotes an interdisciplinary medication reconciliation team approach.

Methods

Design

This QI pilot project is a descriptive cohort study implemented over three months (January – April 2024). To evaluate the pilot project's outcomes, a medication adherence survey was conducted one month after each medication reconciliation appointment with the pharmacist. The data collection occurred utilizing medication adherence surveys and retrospective chart reviews.

Setting

The setting for this project was a Primary Care Medicine Clinic (PCMC) within a large urban academic medical center. Care is provided by 142 residents, a nurse practitioner, 18 nurses, five medical assistants (MA), and one patient care technician (PCTs). The PCMC is supported by multidisciplinary team members such as three pharmacists, two social workers, two diabetic educators, one nutritionist, and four community health workers. The large academic medical center has a robust language services department that enables in-person interpreters to support the patients through their medical visits. The leadership comprises of one medical director, an assistant medical director, a chief resident, one clinical nurse manager, two assistant nurse managers, and an operations supervisor. The average number of patients seen in the PCMC is 3,200 monthly. The average number of LEP patients seen in the clinic is 400 monthly, with the average number of Arabic-speaking patients seen is 80. The monthly average number of pharmacy visits is 2 for Arabic-speaking patients.

Sample

Convenience sampling was conducted for this project. This project focused on patients who speak Arabic, are prescribed two or more medications, who are of the ages 18-99 years old and used an in-person interpreter. The exclusion criteria are those that do

not speak Arabic and are prescribed one or less medications, who are not in the age range of 18-99, and who use a different interpreter modality than in-person.

Procedures

Met with key stakeholders to discuss the best evidence-based implementation strategy that aligned with the organization's goals to address medication adherence in the LEP patients piloting Arabic-speaking patients. The aim, study question, and objectives for the QI project were determined. The patients who were Arabic speaking and who met the inclusion criteria were given a brief description of the project and offered to participate in a survey, all of which were translated into Arabic and given to them by the interpreter on arrival at the PCMC to see their provider. The interpreter stayed throughout the scheduled clinic visits, often including a pharmacy appointment. The visit with the provider included medication discussion and encouragement to make an appointment with the pharmacy, during that time, the pharmacist completed a full medication reconciliation. The survey comprised of demographic data such as gender, age, and language and the translated Morisky Green Levine (MGL) adherence. Patients were surveyed during their follow-up pharmacy visit utilizing the translated MGL survey one month post initial pharmacy visit.

Data Collection and Analysis

The population size and the number of LEP patients who speak Arabic were identified as a baseline who had been seen in the PCMC and had an appointment with the pharmacy within a given month. The clinic manager ran this data from within the electronic medical record and only used it for aggregate data.

During the implementation phase (January – April 2024), the completed surveys were coded and placed in a lockbox. The survey utilized four questions from the validated and translated version of the MGL adherence scale (Awwad et al., 2022; Morisky et al., 1986):

1. Do you ever forget to take your medicine?
2. Are you careless at times about taking your medicine?
3. When you feel better do you sometimes stop taking your medicine?
4. Sometimes if you feel worse when you take the medicine, do you stop taking it?

The data from the surveys was inputted into Microsoft Excel and SPSS for storage. The mean score of each question from the MGL adherence scale was compared to the mean score of the one-month follow-up. The number of Arabic-speaking patients who completed a medication reconciliation with the pharmacist was compared with the number of medication reconciliation appointments prior to the project's implementation.

Approval Process

A formal written approval was obtained from the Institute Review Board (IRB) of the University and the IRB of the organization. There were no ethical considerations to be addressed for this QI project.

Results

Data was collected during the implementation phase of January – April 2024, resulting in ($N = 29$) patients who completed the initial survey. There were ($n = 15, 52\%$) who completed the initial survey but did not meet with the pharmacist for medication reconciliation, and ($n = 14, 48\%$) of patients who completed the initial survey and met with the pharmacist for medication reconciliation. While ($n = 9, 64\%$) patients met with

the pharmacist and completed a medication reconciliation visit but did not come back for a follow-up and to complete the post-survey, however ($n=5$, 36%) completed the one-month post-intervention follow-up and completed their survey.

During the implementation phase, ($n=14$; 100%) There were ($n=6$, 42.9%) patients identified as female and in age groups 30 – 39 ($n=1$; 7.1%), 40 – 49 ($n=1$; 7.1%), 50 – 59 ($n=3$; 21.4%), 70 – 79 ($n=1$; 7.1%). The patients who identified as males ($n=8$; 57%) were identified in age groups 18 – 29 ($n=1$; 7.1%), 30 – 39 ($n=1$; 7.1%), 40 – 49 ($n=1$; 7.1%), 50 – 59 ($n=2$; 14.3%), 60 – 69 ($n=2$; 14.3%), 70 – 79 ($n=2$; 14.3%), 90 – 99 ($n=1$; 7.1%) (See Appendix A). Patients were seen in January ($n=1$, 7%), February ($n=8$, 57%), and March ($n=5$, 36%) for their initial reconciliation appointments and received medication education and resources. There were ($n=9$; 64%) who completed the medication reconciliation visit but did not return for a follow-up visit with the pharmacist. There were ($n=3$, 33%) patients identified as female age group 30-39, ($n=1$, 33%); age group 50-59 ($n=1$, 33%); age group 70 – 79, ($n=1$, 33%) and ($n=6$, 67%) identified as male age 18 – 29 ($n=1$, 17%); age 30-39, ($n=1$, 17%); age 40 – 49, ($n=1$, 17%); age 50 – 59, ($n=2$, 33%); age 70 – 79, ($n=1$, 17%). The mean (M) number of medications pre-implementation was 13.00 before meeting with the pharmacist, with a minimum number of medications prescribed four and a maximum of 26 ($SD=7.263$). After the reconciliation appointment visit, the mean (M) number of medications was 12.44, with a minimum number of medications prescribed four and a maximum of 26 ($SD=7.108$) (See Appendix B). A Wilcoxon Signed Rank Test was performed for the implementation phase for pre-medication reconciliation and post-medication intervention reconciliation phase with a p -value of .655.

The ($n = 5$; 36%) who met their initial medication reconciliation appointment and returned for their one-month follow-up and completed the survey, ($n = 3$, 60%) patients identified as female age 40-49, ($n = 1$, 33%); age 50-59 ($n = 2$, 67%) and ($n = 2$, 40%) identified as male age 60 - 67 ($n = 1$, 50%); age 90 – 99 ($n = 1$, 50%). These patients' mean (M) number of medications pre-implementation was 18.00, with a minimum number of medications prescribed being 14 and a maximum of 29 ($SD = 6.140$). Out of the five, three patients received four interventions provided by a pharmacy, one patient received two interventions, and one patient received five interventions from the pharmacy. Refill support and education were provided in ($n = 3$, 60%), including pillboxes, medication change, increased monitoring, and insulin and continuous glucose monitoring (CGM) education. There were ($n = 2$; 40%) did not receive refill support but were provided resources from the above-named education support, including glucometer teaching. Post-implementation medication reconciliation, the mean (M) number of medications was 16.40, with a minimum number of medications prescribed being 10 and a maximum of 25 ($SD = 6.025$) (See Appendix C). A Wilcoxon Signed Rank Test was performed for the implementation phase for pre-medication reconciliation and post-medication intervention reconciliation phase with a p -value of .109.

As aforementioned the MGL, which consisted of four questions, was provided to each patient during the pre-implementation and post-implementation phases. There were ($n = 14$) who met initially with the pharmacist, while ($n = 5$) met with the pharmacist initially and one month post visit who completed the survey, noting that one pre- survey was not returned. It is of note there was no change from questions one through three, noting that one pre- survey was not returned. On question number four, which asks,

“Sometimes if you feel worse when you take the medicine, do you stop taking it?” a chi-squared resulted in a p -value of 0.248 (see Table 1).

Table 1

MGL Survey Results

MGL Survey Questions (English)	MGL Survey Questions (Arabic)	Pre-Survey (n=13)		Post Survey (n=5)		Chi-Squared Value
		yes	no	yes	no	
Do you ever forget to take your medicine?	هل سبق و نسيت تناول دوائك؟	4 (30.80%)	9 (69.20%)	2 (40%)	3 (60%)	0
Are you careless at times about taking your medicine?	هل احيانا لا تهتم بتناول دوائك؟	3 (23.0%)	10 (77.0%)	1 (20%)	4 (80%)	0
When you feel better do you sometimes stop taking your medicine?	عندما تشعر بتحسن، هل أحياناً تتوقف عن تناول دوائك؟	8 (61.5%)	5 (38.5%)	0	5 (100%)	0
Sometimes if you feel worse when you take the medicine, do you stop taking it?	أحياناً إذا شعرت بسوء عند تناول الدواء، هل تتوقف عن تناوله؟	9 (69.20%)	4 (30.80%)	4 (80%)	1 (20%)	p -value = 0.248

Note: one patient did not return the pre -survey

Discussion

This QI pilot project showed that an interdisciplinary approach in the Arabic-speaking population did not have a statistical significance on medication adherence between the pre-MGL survey and the post-MGL survey. The initial meeting with the pharmacist ($n=14$; 48%) completed a medication reconciliation; however, ($n=5$; 36%) of patients returned for a one-month follow-up visit and completed the post-MGL survey. While ($n=9$, 64%) did not come back for a follow-up and to complete the post-survey.

Missed appointments or no-shows may be associated with the absence of insurance, financial resources, and access to public transportation (Yehekel & Rawal, 2018). Arabic-speaking patients have a communication barrier, and there are known follow-up disparities within the LEP community (Malevanchik et al., 2021). The pharmacist provided medication reconciliation education, refill support, and medication change interventions during the visit. The ($M=18.80$; $SD= 6.140$) number of medication pre-reconciliation and the number of medication post-reconciliation ($M=16.40$; $SD =6.025$), which is a decrease of 2.40. Medication reconciliation support and interventions may provide patients with the needed support over time to see a statistical significance in medication adherence.

Limitations

There are several limitations to this QI pilot project. The three-month time frame was relatively short, patients were scheduled to return to the clinic for four months, which was outside the time frame of this project and the sample size was small that might be contributed to the month of Ramadan, a religious practice of fasting for Muslims, occurred during this project. The automated reminder calls offered by the clinic are provided only in English. PCMC schedules LEP patients, who use an interpreter, for the same length as an English-speaking patient. The limited involvement of the social workers to ensure patient received transportation support. In addition, the residency program consists of a rotating schedule every six weeks.

Recommendations

Recommendations for future projects could be six months in length to consider the time frame when scheduled follow-up appointments that may be four to six months

out. Offer automatic reminder calls in English, Arabic, and other languages. Establish a standard length of appointment of 40 minutes when scheduling an LEP patient with an interpreter, which is two times (20 minutes) the length of an English-speaking appointment. Each Resident team has a consistent pharmacist on their team and/or sends patients to the same pharmacist for consistency. Increase involvement and support of social workers by engaging with the scheduling team daily to facilitate transportation needs during appointment scheduling and practicing cultural respectful care and responsiveness not to implement a project during religious practice times. Future projects could study the impact of missed follow-up appointments on medication adherence.

Conclusion

PCMC had not looked at an interdisciplinary approach to medication adherence within the LEP Arabic-speaking population. The interdisciplinary approach, utilizing an interpreter to help navigate the clinic appointment and include seeing the pharmacist, was found to be beneficial and clinically significant in providing the patients with the support and education needed. This project has provided valuable information and has presented the PCMC with an opportunity to continue to assess medication adherence to other LEP populations (i.e. Spanish, Nepali, Bosnian). Integrating the recommendations and monitoring the limitations gleaned from this project on the impact of an interdisciplinary medication reconciliation approach for LEP patients can possibly improve medication adherence and health outcomes.

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Appendix A

Table 2

Variable	<i>n</i> =14	%
Gender		
Female	6	42.9%
Male	8	57.1%
Age Groups		
18 – 29*	1	7.1%
30 – 39*	2	14.3%
40 – 49*	2	14.3%
50 – 59*	5	35.7%
60 – 69	1	7.1%
70 – 79*	2	14.3%
90 – 99	1	7.1%

Note: (*n*=14) who completed the initial survey and medication reconciliation

Appendix B

Table 3

Number of Medication Reconciliations for Patients with initial pharmacy visit

	N	Maximum	Minimum	Mean	Std. Deviation
Pre-Medication Reconciliation	9	26	4	13.00	7.263
Post Medication Reconciliation	9	26	4	12.44	7.108

Note: Descriptive data on ($n=9$) maximum number medications and minimum number of medications prescribed prior to meeting with pharmacist for medication reconciliation and after meeting with pharmacist. The variation in the (M) pre and post was a result of prescribed medications remaining constant while some patient's medications were adjusted but remained in the minimum of four and a maximum of 26.

Appendix C

Table 4

Number of Medication Reconciliations for Patients who completed follow-up visit

	N	Maximum	Minimum	Mean	Std. Deviation
Pre-Medication Reconciliation	5	29	14	18.80	6.140
Post Medication Reconciliation	5	25	10	16.40	6.025

Note: Descriptive data on (n=5) patient who completed the follow up visit. Shows the maximum number medications and minimum number of medications prescribed prior to meeting with pharmacist for medication reconciliation and after meeting with pharmacist.