

INITIATING PRERECORDED VIDEO MESSAGES FOR BI-RADS 0 SCREENING
MAMMOGRAM RESULTS IN THE DIGITAL AGE: A PILOT STUDY

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Degree of Doctor of Nursing Practice

Date 11/14/2024

Submitted in partial fulfillment of the requirements for the
Degree of Doctor of Nursing Practice
William Paterson University

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ABSTRACT

Breast cancer is the second leading cause of deaths in women and efforts to encourage early detection persist to be the main goal in fighting breast cancer (Shah et al., 2019). Delays from screening to diagnostic mammogram can lead to late cancer diagnosis and treatment. In addition, delays in the treatment of breast cancer have been associated with increased mortality and each 60-day delay in surgery is linked with a 26% increased risk of death (Hawrot et al., 2021). Among the minority population, language barriers have been shown to have a harmful effect in quality of care (Cataneo et al. 2023). This has been correlated with a lack of comprehension regarding follow-up instructions and reduced satisfaction (Cataneo et al. 2023). The purpose of this study is to assess the impact of multilingual pre-recorded video method in decreasing the turnaround time from screening to diagnostic mammogram. This study was conducted utilizing a cross-sectional quantitative research design and although the hypothesis that multilingual prerecorded video messages would positively influence response interval was not firmly supported, patient feedback did indicate that the use of layman's terminology and use of preferred language had a significant impact on patient satisfaction almost unanimously for non-English speakers.

ACKNOWLEDGMENTS

I extend my deepest gratitude to my DNP team, Dr. Christine Weiselberg, Dr. Kem Louie, and Dr. Emily Mahon who have provided me with invaluable guidance, support, and encouragement during this journey. I am beyond thankful for the many advisements, revisions, and data analysis that have gotten me to where I am today.

This project would not have been completed without the support of the Englewood Health (EH) staff. I am forever thankful for everything done to help me along the way. I would also like to thank my coworker Kathleen Cahill APN for all the assistance, valuable insight, and expertise during this process. To all my wonderful friends, coworkers, and colleagues, thank you for cheering me on from the side.

I would also like to acknowledge my beloved parents, sisters, and grandparents. Your sacrifices, unconditional love, and unwavering support have shaped who I am today. I am so grateful for everything you've done for me.

Lastly, this achievement would not have been possible without God who has given me the strength to accomplish every goal I've set in ways I never thought possible. *Philippians 4:13*
I can do all things through him who gives me strength!

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CHAPTER 1

Introduction

Informatics and healthcare technologies are used to tackle and enhance the delivery of safe, high-quality, proficient healthcare services in agreement with best practice and professional regulatory standards (Vortman et al., 2022). Nursing informatics puts the spotlight on allowing patient engagement and autonomy in healthcare, but barriers persist such as comprehension and language. The 2020 Census exposed a more racially and ethnically diverse United States (US) population than in preceding decades (Rivera-Burciaga et al., 2022). These changes drive an increasing need for healthcare that is culturally aware, sensitive, and comprehensive, with a workforce that represents the populations it serves. As societal requirements add to meet patient needs in the health care setting and throughout the continuum, the ability to become innovative becomes a priority. Understanding the innate strength of collaboration can only come from recognizing and embracing differences and nurturing similarities. Amplified use of health care information technology (HIT) can lessen health care costs, decrease errors, and offer better patient care outcomes.

This Doctor of Nursing practice (DNP) project focuses on transitioning from the modern-day practice of releasing standard radiological reports by letters and phone calls to a more patient centered method of interpreting screening mammogram results in the digital age. Chapter 1 presents the background, purpose, research question, and DNP Project Objectives.

Background

Breast cancer is the second leading cause of deaths in women and efforts to encourage early detection persist to be the main goal in fighting breast cancer (Shah et al., 2019). The prognosis for long-term survival improves with early-stage disease than for those with more

advanced disease (Menon et al., 2024). At the Leslie Simon Breast Care and Cytodiagnosis Center at Englewood Health, the time from screening to diagnostic mammogram in calendar year 2023 is 8.6 days. Long wait times before breast cancer diagnosis and the start of treatment are of concern if delay leads to cancer stage progression, worsening disease, and or treatment complications.

In a study by Hawrot et al., (2021), the time from breast cancer diagnosis to treatment initiation has increased by about 10 days in the last decade. This puts the 275,000 women who are diagnosed with breast cancer in the United States every year at risk for substandard outcomes. Furthermore, delays in the treatment of breast cancer have been associated with increased mortality and each 60-day delay in surgery is linked with a 26% increased risk of death (Hawrot et al., 2021). Although many screening mammogram callbacks do not result in cancer diagnosis, it is critical that proper follow-up ensues to improve the efficacy of mammogram as a screening tool.

Prevalence and Rates of Breast Cancer in the Minority Population

In 2020, there were 239,612 new cases of female breast cancer reported among women and 42,273 deaths due to breast cancer in the US (National center, n.d.). However, occurrence and mortality rates varied by race. Racial/ethnic minority women in the United States (US) face health care quality disparities compared to non-Hispanic White women in general and recognizing barriers to increase return rate in a timely manner for racial/ethnic minority women is critical (Miller et al., 2019).

According to Miller et al. (2019), the occurrence rate for White women is higher than Black, Asian/Pacific Islander, American Indian/Alaska Native, and Hispanic women (127.7 of 100,000 versus 125.1/100,000, 98.5/100,000, 82.2/100,000, and 93.1/100,000, respectively). Yet,

the mortality rate for Black women (29.2/100,000) is higher than that of White women (20.6/100,000). Black women also have higher incidence rates of breast cancer below age 40.

Mortality rates for Asian/Pacific Islander, American Indian/Alaska Native, and Hispanic women are comparatively low (11.3/100,000, 14.1/100,000, 14.4/100,000, respectively).

However, breast cancer occurrence rates have increased every year between 2005 and 2014 for Asian/Pacific Islander (1.7%), Black (0.4%), and Hispanic women (0.3%), but rates have been stable for White and American Indian/Alaska Native women (Miller et al., 2019).

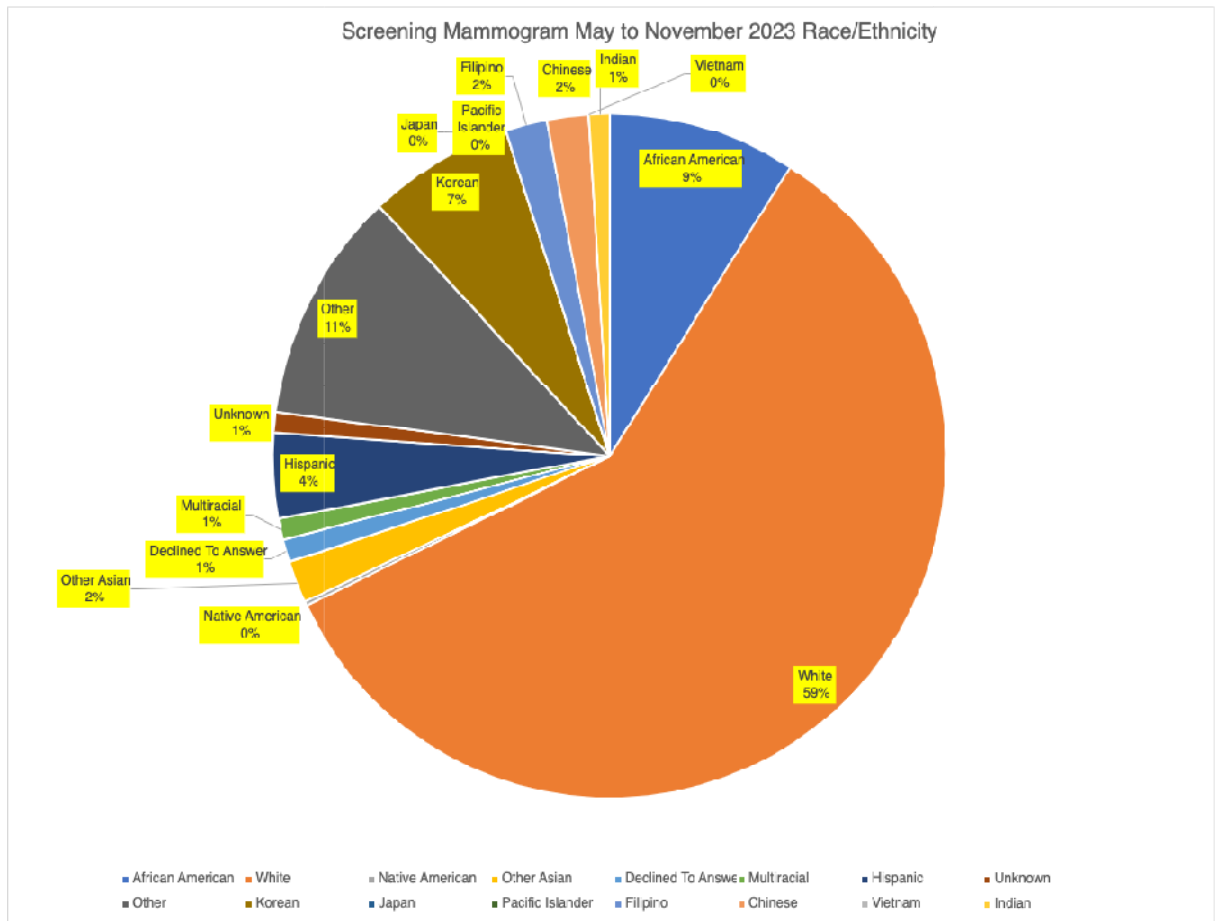
Mammography Use Rates of the Minority Population

The Centers for Disease Control and Prevention (CDC) in 2019 indicated that Non-Hispanic Black women have the highest mammography use rate at 71.1%. Hispanic women have the next highest rate 69.4%, followed by Non-Hispanic White at 69.2%, and Asian/Pacific Islander women at 63.7%, respectively (National center, n.d.). American Indian/Alaska Native women have the lowest mammography use at 61.3% (“National center,” n.d.). Because mammography screening is the gold standard for detecting cancer, it is imperative to increase use among the minority population to lower breast cancer mortality rates predominantly among the Asian/Pacific Islander, African American/Black, and Hispanic women for whom incidence rates are rising. There is a critical need to offer culturally sensitive mammography report interpretation among the minority population.

Similarly, for the calendar year of May-November 2023, screening mammography use varied by race and ethnicity at Englewood Hospital (EH) Breast Center. Please see attached graph:

Figure 1

Englewood Health Screening Mammogram Patient Population May-November 2023



Identification of the Problem

As of April of 2021 under the 21st Century Cures Act, healthcare providers and hospitals are required to release finalized imaging reports instantly to patients (Wieland et al., 2022). As patients are becoming readers of radiology reports, simplicity is a public and professional anticipation. Release of screening mammogram results directly to the patient in words that are easy to understand allows for an increase of patient participation in their care.

Regardless of the federal law of the Mammography Quality Standards Act (MQSA) obligating each breast center to send a written report in lay language summarizing the exam

results to all patients within 30 days after the screening mammogram, it has been observed that most patients want their imaging results as soon as possible, instantaneously after the imaging study (Shah et al., 2019). Furthermore, results are not always punctually communicated to patients by referring physicians and this delay in communication can be harmful to patient health and outcome (Shah et al., 2019). In addition to this, a study by Wahab et al., (2020) found that when letters summarizing results above a fourth-grade reading level were sent to patients, only 49.6% of patients comprehended the requirement for follow-up with additional imaging.

The Radiological Society of North America's (RSNA) Radiology Cares campaign and the American College of Radiology (ACR) Imaging 3.0 initiative have been advocating since 2007 to modify radiology through enhanced communication (Wahab et al., 2020). These campaigns work to enhance patient care by lessening communication errors, reduce patient stress and anxiety by offering results in a timelier fashion, and lessen delays in patient care. By carefully reviewing data trends and patterns, modifying procedures/policies, and continuing to assess patient needs, providers will be able to offer high-quality patient care and satisfaction.

Healthy People 2030

Healthy People 2030 goal centers on assisting health care providers and patients utilizing Health Information Technology (HIT) efficiently to access and exchange health information (Healthy People 2030, n.d.). Through HIT, people can easily access electronic health information, track, and manage their care. However, accessing and understanding HIT can be difficult. Strategies for video messaging of mammogram results in patients preferred language and layman's terms that simplify, modernize, and promote the use of HIT can make electronic health information easier to access, use, and comprehend. This will encourage people who have the required information to make informed decisions regarding their care. Strategies to

streamline HIT systems can make it easier to electronically exchange health information and may result in enhanced health outcomes.

Digital health literacy has a significant impact on empowerment and patient self-care regarding their pathology (Parrado et al., 2022). Cultural knowledge is described as the process of seeking and assembling an in-depth knowledge of health-related beliefs and cultural values, disease occurrence and frequency, as well as beliefs regarding treatment effectiveness (Harrison et al., 2019). Incorporating cultural competence as a health system and professional service is hence significant to guarantee unbiased healthcare quality for consumers from all ethnic backgrounds. A multimodal approach that incorporates strategies to facilitate engagement with ethnic minority consumers beyond the stipulation of translated brochures such as with prerecorded videos may be important.

For a healthcare system to serve everyone equitably, the nursing workforce must mirror the variety of the population it serves. The Institute of Medicine (IOM) released its landmark report, *The Future of Nursing: Leading Change, Advancing Health*, which called for more racial, ethnic, and gender diversity among nurses to enhance quality of care and lessen health disparities (Stanford, 2020). Cultural diversity in nursing offers patients more trust and confidence because they can better communicate and relate to their caregivers. In addition to enhancing interactions with patients, inclusion in nursing encourages an innovative work setting that is tailored specifically to diverse patient populations. This then promotes an establishment of culturally competent practice, transformation of healthcare, and ensures greater health equity.

Purpose of the Study

Radiologists and healthcare providers utilize a standardized system in medical reporting to describe screening and diagnostic mammogram findings called the Breast Imaging Reporting

and Data System (BI-RADS) (Cleveland Clinic, 2022). This system sorts the results into categories numbered 0 through 6:

Incomplete (BI-RADS 0) refers to a probable abnormal area and requires specialized additional images to assess it.

Negative (BI-RADS 1) is defined as no significant abnormality to report. The breast(s) do not have any masses, distorted structures or suspicious calcifications. In this case, negative means there are no abnormal areas or findings.

Benign (noncancerous) finding (BI-RADS 2) results mean that the radiologist found a benign (noncancerous) configuration in the breast, such as benign calcifications, cysts, lymph nodes or fibroadenomas. The radiologist records this finding to assist when comparing it to future mammograms.

Probably benign (BI-RADS 3) means that there were one or more findings that are not cancerous. Additional imaging will be required in six months to see if the area changes over time.

Suspicious abnormality (BI-RADS 4) means mammogram findings could be cancer.

Highly suspicious (BI-RADS 5) means that the mammogram indicates at least a 95% chance of breast cancer.

A known biopsy with proven malignancy (BI-RADS 6) means that a breast cancer diagnosis has been confirmed.

This DNP project will focus on BI-RADS 0 screening mammogram results, only. The integration of video messaging results in patients' preferred language and in layman's terms will decrease the turnaround time from screening to diagnostic imaging and lead to earlier detection of breast cancer. By implementing prerecorded video messages for screening mammogram

BIRADS 0 results in three different languages, the goal is to allow patients to be engaged and actively participate in their own care, enhance quality improvement, and improve patient provider communication as well as patient non-adherence.

Research Question

Study Aim. The main aim of the study is to assess the impact of multilingual prerecorded video messaging of BI-RADS 0 results in decreasing the turnaround time of screening to diagnostic mammogram. This will be accomplished through patients' increased comprehension, preference, and satisfaction of the radiology report.

Research Question 1. What is the relationship between implementation of multilingual video messaging system and follow-up return interval for BI-RADS 0 screening mammogram results?

Research Question 2. Does delivery of BI-RADS 0 screening mammogram results by video vs. traditional letter or phone call increase patient comprehension, preference, and satisfaction?

Operational and Conceptual Definitions

Callback or Recall. The terms callback or recall can be used interchangeably and refers to a situation where the radiologist needs to get a clearer image of the breast tissue and it is not indicative of cancer (Scardelli, 2022). This requires a second (diagnostic) mammogram or additional imaging to further evaluate any abnormalities or unclear results from the initial screening (Scardelli, 2022). The turnaround time from screening to diagnostic imaging will be measured from the date of released video to follow up appointment.

Comprehension. Measures how successfully patients interpret the meaning or significance of the video messaging system summarizing the radiology report. Comprehension

will be measured in a yes/no format on the initial screening survey by asking, “Did you find the video messaging easy to understand?”

Response Interval. Measures the time from the release of video by email to the scheduled appointment date.

Patient satisfaction. Patient satisfaction is a measure of how content a patient is with video messaging system compared to the traditional methods of phone call or letter. A woman’s satisfaction with the mammography experience may affect whether family and friends undergo mammography at the chosen breast center. This will be measured on a Likert scale on the initial screening survey by asking, “Does the video messaging system to communicate screening mammogram results increase your likelihood of recommending our facility to others?”

Preference. Measures individual’s predilection, confidence, and precision in interpreting video messaging results. Preference will be measured in a yes/no format on the initial screening survey by asking, “Do you prefer the video messaging method of receiving results over the traditional method of a phone call or letter?”

Video Messaging System. The prerecorded video message is designed to deliver results for an abnormal screening mammogram asking the patient to return for additional imaging (BI-RADS 0). Three nurse practitioners, two bilingual and one English speaking nurse practitioner will record three video message results in English, Korean, and Spanish. A simplified description of an abnormal mammogram for all three languages will be utilized for this pilot study.

Significance to Nursing

Rapidly evolving technology and demands in meeting today’s healthcare requirements are at the forefront of healthcare delivery (Clark & Hoffman, 2019). The American Nurses Association (ANA) Scope and Standards of Informatics (as cited in Clark & Hoffman, 2019)

advocate for a high-tech setting in the healthcare system which necessitates providers to be proficient in skill, communication, leadership, enhanced collaboration, and the safe use of informatics.

With the prevalence of HIT and patient portals such as *MyChart*, radiology results are now rapidly accessible and read in detail by patients (Lee et al., 2016). In the historical report *The Future of Nursing, Leading Change, Advancing Health* (as cited in Gray & Rutledge 2014), the IOM further highlights the significance of the nursing profession's proficiency in communication technology tools for interprofessional collaboration and care coordination to encourage the general health of the nation.

Features of the portal that encourages patient use include enhanced communication, increased patient empowerment, and resulting in a positive impact on self-management. The integration of digital health literacy in clinical practice will lead to an increase in treatment of patients that advantage from these digital resources and will reduce the physical, psychosocial, and economic impact derived from the lack of compliance and participation in their care (Parrado et al., 2022).

With HIT tethered patient portal, patients have 24/7 access to their health information. Despite low economic status, most patients have access to either a computer or smart phone where they can review all their medical information. This easy access empowers and supports them to be more involved in their health care. Closely tracking patients via HIT permits early detection of health problems, treating conditions before they become acute, which lowers general treatment costs. Video messaging in patients' preferred language and comprehension level or layman's terms would allow patients to understand imaging results while preserving the purpose of the report as a communication method.

DNP Project Objectives

In this consumer-driven health care setting, patients are asking for timelier and understandable access to their health information as well as opportunities to pioneer their own care (Lee et al., 2016). In a survey study of patients and their preferences for the timing of radiology results, most participants favored accessing reports through an online patient portal, even when the results were seriously abnormal (Lee et al., 2016). Although receiving results through patient portals such as *MyChart* is quicker than receiving a letter in the mail, the general understanding of written radiology reports is low (Gunn et al., 2017). In addition, a study confirmed that layman translations regarding standard radiology report improves patients' and caregivers' understanding with statistically significant and clinically meaningful increases in readability (Wieland et al., 2022). Therefore, it is highly recommended to respond and meet demands for patient participation in results reporting.

DNP Essential I: Scientific Underpinnings for Practice utilizes science-based theories and concepts to establish the significance of health care delivery phenomenon and describes the advanced actions needed to advance, alleviate/ameliorate care delivery, and evaluate outcomes. Technological inspiration in nursing is an imaginative process that involves innovators to appreciate and contribute to the growth and execution of technology with ground-breaking ideas (Bahari et al., 2021). By implementing video mammography results in the patient portal, the goals are to increase follow-up appointment times, consequently save lives, and attain patient wellness through prompt appointments for treatment.

DNP Essential IV: Information Systems/Technology and Patient Care Technology for the Improvement and Transformation of Health Care focuses on enhancing the quality of care to convey services in ways that directly meet patients' preferences and needs, which entails

delivering brief but focused results and recommendations. HIT will be utilized to offer better, more proficient and less expensive care while being compliant with HIPAA security and privacy requirements.

DNP Essentials II: Organizational and Systems Leadership for Quality Improvement and Systems Thinking and VIII: Advanced Nursing Practice focuses on incorporating diverse, culturally competent care by establishing rapport with patients, families, and other health professionals to conduct a complete, systematic assessment of healthcare. It requires an advanced level of clinical judgment, systems thinking, and responsibility in designing, delivering, and evaluating evidence-based care to enhance patient outcomes. The APN will generate innovative technology that will be used to plan, expand, and solve problems for improving the quality of nursing services. The APN will think “out of the box” and tailor practice to novel trends, while keeping patients’ needs and well-being at the core. Through implementing prerecorded video messages for screening mammogram results in three different languages, the goal is to allow patients to be engaged and actively participate in their own care, enhance quality improvement, improve patient-provider communication and patient non-adherence, and thereby lessening morbidity/mortality.

DNP Essential VI: Interprofessional Collaboration for Improving Patient and Population Health Outcomes focuses on data which offers the capacity to enhance clinical outcomes, manage population health, offer patient-centric health care, and lessen costs. Team performance is measured by the capacity to reach, engage, assess, recognize gaps in knowledge or action, educate, and successfully change behavior (Gibson et al., 2022). APNs can utilize the power of data analytics to offer quality health services with their teams, understand the outcomes, establish whether individual health consumer expectations are met, and advocate for

supplementary services or program improvements. By guiding teams to meet performance metrics and satisfaction goals, APNs are impacting the Quintuple Aim through their efforts and consumer expectations (Gibson et al., 2022).

The capacity to gather the data permits the organization to see a holistic view of patients and populations, thereby gaining innovative insight into patient follow-up, recognizing the best care of individuals, and anticipating health events. APNs along with their interprofessional partners have opportunities to be part of the hands-on planning of data to gather, analyze, use, and integrate, to measure population health goals and support additional strategies. By leveraging consumer information, the level of health ownership and health status are better understood which are then used to develop and provide the upmost quality services.

Summary

Chapter one focused on the importance of releasing BI-RADS 0 screening mammogram results directly to the patient in words that are easy to comprehend. Chapter two introduces the theoretical framework and relevant literature pertaining to technological advancements in delivering screening mammogram results.

Chapter II

Literature Review

Chapter two will present a review of the literature. Using the principles of evidence-based practice (EBP), a search of ScienceDirect and Google Scholar was performed using the terms, “screening mammogram results,” “mammogram satisfaction,” and “language barrier mammogram.” Inclusion criteria included scholarly/peer-reviewed, English language, published between the years 2018-2023. The abstracts were reviewed and articles that met inclusion criteria were chosen. Inclusion criteria included those articles that specifically addressed screening mammogram results and recommendations. There were a total of six studies included in the final review. Studies were organized around five topics: (1) studies that examined the acceptable wait time for results, (2) patients' preferences on how to receive screening mammogram results, (3) patients' confidence level of interpreting radiology reports with and without layman translations, (4) efficacy of utilizing technology to deliver screening mammogram results, and (5) language barriers in screening for breast cancer among the minority population.

Theoretical Framework

Currently, the phrase “caring” is quickly transitioning to include the implementation of sophisticated healthcare technologies to enhance nursing care excellence (Bahari et al., 2021). In this digital era, people face a world full of advanced technologies in all aspects of human life, including health care. Hence, innovative technology can be used to enhance the competence, efficiency, and quality of healthcare services.

Locsin's Technological Competency as Caring in Nursing Theory represents practice grounded in the harmonious coexistence between technology and caring in nursing (Locsin, n.d.). The concepts of this nursing theory include technologies in nursing, caring in nursing, and

human beings as a person (Krel et al., 2022). Technologies in nursing are tools that nurses use in practice. Technological understanding involves the competent use of technology to help a nurse get to know a person as a whole (Krel et al., 2022).

Caring actions are perceived as compassion, conscience, trust, and commitment (Krel et al., 2022). Locsin cited propositions as the incessant acquisition of information obtained through technologies in nursing - about human beings who are dynamic as a holistic person (Krel et al., 2022). The development of technology in nursing is an ever-changing and demanding process, while caring in nursing is the substantive body of knowledge that drives the practice of knowing a person.

This theory can be used as the momentum to implement advanced technologies in healthcare as an act of caring. If nurses do not appreciate and contribute to the growth and execution of technology with ground-breaking ideas, the nursing profession and the patients' interest will suffer (Bahari et al., 2021). Technological inspiration in nursing is an imaginative process that involves the nurse-innovators in co-creating technologies through collaborating in an encouraging setting (Bahari et al., 2021). Through technological creativity, nurses act to resolve the health problems of patients, nurses' own challenges within their work, and encourage patient wellness (Bahari et al., 2021).

Utilizing Locsin's (n.d) Technological Competency as Caring in Nursing Theory, anticipated goals can be an innovative practice based on evidence based practice (EBP) at the Englewood Health Breast Center and improvement in patient experience scores as well as increase in compliance and turnaround time for additional imaging. Furthermore, culturally diverse radiology APNs will have more opportunities to increase their visibility through direct communication with patients, enhancing their role in patient care.

Literature review

In the first seminal study, Dolan et al. (2001) assessed factors linked with patient satisfaction with communication of mammography results and their understanding and ability to recall these results. A cross-sectional telephone survey in a 10-day period in April 1999 was conducted among 298 patients who had either a screening or diagnostic mammogram. The survey assessed the wait time for results, level of anxiety, satisfaction of results reporting, and patients' understanding of results and recommendations. It was concluded that women who underwent screening exams were more likely to be dissatisfied with the way the results were communicated than those who underwent diagnostic exams and received immediate results (20% vs 11%, $P = .05$). After adjustments for the other variables among patients who had screening exams, age and whether the results were normal or abnormal were not associated with overall dissatisfaction with communication of results. However, considerable or extreme anxiety over waiting more than two weeks for results, low ratings of how clearly results were explained, and the ability to get in touch with someone with questions; were all significantly associated with overall dissatisfaction with results reporting.

In this study by Dolan et al. (2001), 33 (37%) of the 89 surveyed women with normal screening exams reported that they had not yet received results at four weeks after completing the mammogram. Patients who had normal screening mammograms were less likely than those with abnormal screening mammograms to have received their results within two weeks of the exam (57% vs 33.9%, $P = .01$). Furthermore, patients who underwent abnormal screening mammograms were more likely than those with normal results to be dissatisfied with their ability to get in touch with someone to answer questions and were more likely to report considerable or extreme anxiety about their results.

The study shows that in addition to its influence on general satisfaction with results reporting, lack of transparency about explanations of results has grave consequences. Although discordance rates were low among the screening mammography patients, 35.7% of these patients reported that they were unable to recall any follow-up recommendations. 23% of those with abnormal mammograms necessitating further follow-up either did not recall their follow-up recommendations or believed they could return to annual or routine screening. In summary, the results of this study propose that the way mammography results and recommendations are communicated is more significant than the actual results in determining satisfaction with results reporting. Therefore, enhanced verbal communication of results with sensitivity to patients' medical literacy level are possible strategies that warrant investigation.

Acceptable Wait Time for Screening Mammogram Results

Another study regarding communicating mammography results was conducted by Shahet al. (2019) in Virginia during the study period of August 21, 2017 to November 9, 2017. The aim of the survey study was to comprehend the preference with regards to the wait time for screening mammogram results; whether immediate communication of mammogram results was of significance to patients, and the acceptable time frame to schedule an additional imaging follow-up appointment after an abnormal screening mammogram, and how patients wanted to be given their screening mammogram results.

There were 2,245 patients who participated in the survey. Slightly over 70% of survey respondents preferred wait times of less than 48 hours for receiving their screening mammogram results. Most individuals favored scheduling their follow-up appointments soon after their initial appointment, preferring either the next day or within 1 to 2 days. Finally, over half of the sample preferred to be contacted via a telephone call, with letter and text messaging being the next most

avored methods, and e-mail being the least preferred. Survey results of this study recommend that the preferred wait time for screening mammogram results was either to wait at the time of screening mammogram appointment or to receive results within 48 hours.

The next studies examined the methods on how patients preferred getting results. Lee et al. (2016) conducted the largest cross-sectional study of patient access to radiology reports involving almost 130,000 patients in a major health system. The results indicated that there was a high patient interest in reading radiology reports online with 51.2% of all patients with web portal access viewing accessible radiology reports. This high level of interest among patients is confirmed by previous, smaller studies regarding patient choices for getting radiology results. Among surveyed patients using web portals, 79% of patients reported favoring a new portal-based method of receiving results over historical methods such as by mail or directly from the referring physician.

In addition, a patient focus group study found that most patients were dissatisfied with the customary reporting of radiology results, citing delays leading to excessive anxiety and stress and little detail when radiologic findings are relayed orally by a referring physician (Lee et al., 2016). One essential in enhancing the quality of care is to convey services in ways that directly meet referring providers' and patients' preference and needs, which includes being brief and focused on the diagnostic aspect. It was recommended that moving forward, hospitals will have to regulate reporting practices to meet this demand.

Preference of Video Messaging vs. Traditional Methods

In the study by Wahab et al., (2020), the researchers conducted a prospective study and assessed patients' preferences for receiving screening mammogram results via a video message from the radiologist versus the traditional methods such as by mail or phone call. Participants

then completed an online survey regarding the method of results delivery. Around 80/94 participants ranging in age from 40 to 76 years old responded (85% response rate), of which 73% (58/80) favored a video message from the radiologist for their mammogram results ($p = 0.029$). When analyzed by age, the video results were most preferred by patients 40-60 years old. When analyzed by education level, participants with a Master's or Bachelor's degree favored receiving their results by video. In addition, the video message results were much faster than a printed mailed letter and slightly faster than an electronic medical record portal (Wahab et al., 2020).

Confidence and Precision in Interpreting Radiology Report

Wieland et al. (2022) also reviewed oncology patients' and caregivers' confidence and precision in interpreting radiology reports, where the reports were presented either with or without layman translations and their opinions on access to radiological results through an online portal. This prospective, randomized study was conducted at Queen's Medical Center (Honolulu, HI, USA) and surveys were collected at a community cancer center between April 2021 and June 2021. All consenting participants were randomized to read either a standard radiology report (standard report) or the standard radiology translated into layman terms (layman report). The layman terms had been previously reviewed by a radiologist and a medical oncologist to ensure information consistency and accuracy. The reading comprehension level of the layman report was checked using multiple readability tests to ensure readability at less than a 5th grade level. Randomization occurred by alternating the two versions of the radiology report.

Participant characteristics such as age, income, education level, patient vs. caregiver, and confidence in navigating the internet were not considerably linked with capacity to understand the radiology report or medical terms. Univariate binary logistic regression models showed that

participants who read the lay report were eight times more probable to find the radiology report easy to read. In the free response answers from participants who read the standard report, the use of medical terminology appears as a point of confusion. In the study, 63% of the survey respondents had at least a college degree, which is significantly higher than the nationwide average value of 32.5%. Therefore, technological advances such as prerecorded videos may offer an added benefit of decreasing patients' confusion about their results and follow-up recommendations as proposed in this study.

The study by Wieland et al. (2022) established that the use of layman's terms in radiology report enhances oncology patients' and caregivers' understanding of such reports. The difference in readability of the reports was statistically significant ($p < 0.05$) and clinically significant. 82% of participants reported easy readability with the layman report compared to only 33% with the standard reports. This study reveals that patients and caregivers do not usually have the capacity to appreciate the multifaceted medical jargon written in standard radiology reports. This finding is consistent with other studies showing that patients have trouble understanding standard reports and would favor lay translations.

Language Barriers among the Minority Women

Cataneo et al. (2023) retrospectively reviewed the 2015 sample of the National Health Interview Survey (NHIS) database to explore if women with limited English language proficiency are at risk for omitting breast cancer screening. The inclusion criteria for the cohort included women with and without Limited English Proficiency (LEP) between 40 and 75 years. Cataneo et al. (2023) evaluated differences in screening rates, baseline, socioeconomic, access to healthcare, and breast cancer risk factors with univariate and multivariate regression analyses. The prevalence of LEP was 5.7% (N = 1825). LEP women showed a statistically significant

lower rate of overall screening mammograms (78% vs. 90%), fewer benign lumps removed (6.4% vs. 17%), and lower rates of access to healthcare variables.

The results from the study showed that LEP women are linked with a lower probability of having a screening mammogram. Particularly, the Spanish speakers were found as a vulnerable subgroup. These findings are consistent with other studies analyzing language barriers with preventive or early detection interventions. Other studies have looked at similar relationships, particularly analyzing cancer screening and speaking a language such as Spanish, French, or Chinese and similar results have been found (Cataneo et al. 2023).

The results from this study show nationally an understudied subgroup that is at risk for inferior rates of breast cancer screening. Language barriers have been shown to have a harmful effect on quality of care and this has been correlated with lack of comprehension regarding instructions and reduced satisfaction. Cataneo et al. (2023) believe that bilingual health care providers have the capacity to efficiently bridge the language gap and add cultural competence in their care.

Summary

Chapter two reviewed six studies over the years that focused on delivering screening mammogram results among the minority population. According to each study's conclusions, most patients who underwent screening mammogram preferred timely, understandable results of imaging studies and were open to technological advances. The next chapter introduces the proposed methods for conducting this study.

Chapter III

Methods

The primary outcome of this study is to reduce the current 8.6-day time interval from screening to diagnostic mammogram by 10% utilizing the multilingual pre-recorded video method. Secondly, this study seeks to determine whether delivery of patients' results via video in their preferred language in layman's vernacular increases patient satisfaction and comprehension. This study will also evaluate preference on receiving results by video over traditional methods such as phone call or letter.

Further discussion will go on to identify the design, setting, sample, and procedure for the data collection. The instrument utilized for the screening survey, as well as the reliability and validity of the survey, will be discussed. A proposed analysis of the data of the results is also included.

Design

This study was conducted utilizing a cross-sectional quantitative research design to explore:

Research Question 1. What is the relationship between implementation of multilingual video messaging system and follow-up return interval for BI-RADS 0 screening mammogram results?

Research Question 2. Does delivery of BI-RADS 0 screening mammogram results by video vs. traditional letter or phone call increase patient comprehension, preference, and satisfaction?

Through this project, the goal is to decrease the number of days from BI-RADS 0 screening mammogram to diagnostic mammogram in May-November 2024 by 10% (from 8.6 days to 7.74 days).

Setting

The project was implemented at The Leslie Simon Breast Care and Cytodiagnosis Center at Englewood Health (EH). EH is a teaching, 547-bed, acute care hospital in Bergen County and the third largest in New Jersey. The Leslie Simon Breast Care and Cytodiagnosis Center at Englewood Health offers both screening and diagnostic testing for benign breast conditions and breast cancer. The center conducts about 28,000-29,000 mammograms per year and has a return rate of 9-10% (“Englewood Health,” 2024). The Leslie Simon Breast Care and Cytodiagnosis Center is accredited by the National Accreditation Program for Breast Centers (NAPBC) and is the first breast center in New Jersey to earn this accreditation from the NAPBC (“Englewood Health,” 2024). The Leslie Simon Breast Care and Cytodiagnosis Center has also been designated Comprehensive Breast Imaging Center by the American College of Radiology and recognized by the U.S. Congress as a model for the diagnosis and treatment of breast disease (“Englewood Health,” 2024).

Recruitment Methods & Consent

Women 40 years and older who speak and read English, Korean, or Spanish presenting for annual screening mammograms with no clinical symptoms were identified. The APN spoke with the patients who were provided with a brief introduction and description of the project. The initial screening survey (Appendix C) in their preferred language was obtained from those interested in participating in the project. Participating patient labels were placed on the screening survey and were placed in the designated bin for the author to track.

Sample

Several organizations, including the National Comprehensive Cancer Network, American Cancer Society, and the American College of Radiology advise yearly screening mammograms beginning at age 40 for all people assigned female at birth (AFAB) with an average risk of

developing breast cancer (“Mammogram,” 2022). The convenience sample included as many subjects as possible who met the inclusion criteria and completed screening mammogram at the breast center that responded to the surveys and required additional imaging (BI-RADS 0).

Inclusion criteria included females whose first spoken languages are English, Korean, or Spanish with no limitations in reading Korean, English, and or Spanish. As a requirement, participants must have been assessed as BI-RADS 0 for their screening mammogram results and have an active email account.

Exclusion criteria included those who do not have access to smartphones or computers, do not provide/disclose email addresses, cannot read in their native languages, as well as those who are hearing and visually impaired. Screening mammograms with same day readings and diagnostic mammograms were excluded from the study. Exclusion criteria included screening mammograms that are BI-RADS 1, 2, 3, 4, 5, & 6. There were no exclusions based on cancer history, education level, pregnancy, or gender identification.

Procedures

The DNP project was implemented for six months between May 2024 - September 2024. The marketing/communications team assisted in translating and tailoring video script (Appendix E) and the initial screening survey to layman’s term for all three languages.

Video Message Recording

Three nurse practitioners (two bilingual and one English speaking nurse practitioner) recorded three video message results in English, Korean, and Spanish. The multilingual prerecorded video message was designed to deliver results for an abnormal screening mammogram asking the patient to return for additional imaging (BI-RADS 0). A simplified description of an abnormal mammogram was utilized for this pilot study. Individualized videos

were not made for each study participant. All three nurse practitioners had a standard video script (Appendix E) approved by the communications team in English, Korean, and Spanish.

Participants' data was obtained through EPIC chart review on those whose screening mammogram recommendations required follow-up visits for BI-RADS 0 only. Those participants who required diagnostic imaging after the screening mammogram were sent an email with the video in their preferred language. Patients were instructed to call the scheduling center to be scheduled for their required follow-up imaging. The spreadsheet created by the author, an APN and a DNP student (Appendix D) was used to track return dates from the time the video was released by email and when the follow-up appointment was made. After consenting participants received the video by email, participants then completed a survey (Appendix F) asking 2 questions in a yes/no format regarding the preferred method of results delivery and comprehension of interpreting radiology results. To measure video satisfaction, they chose their response on a Likert scale. The responses were emailed back to the author.

Instrument

An initial screening survey (Appendix C) is a written instrument tool also designed by the author, a nurse practitioner, and a DNP student which was used to collect demographic data and return dates of diagnostic mammogram from the initial screening mammogram. This initial screening survey was offered in English, Korean, and Spanish and provided a choice for the preferred language of the video. Reliability and validity cannot be measured. However, the initial screening survey was reviewed for content validity, information accuracy, and consistency in English, Korean, and Spanish by the three expert clinicians including the communications/marketing team, Breast Center director, and Chief of Radiology.

Protection of Human Subjects

Permission for implementation of the project was obtained by Englewood Health, the Director of the Breast Center, and the Chief of Radiology Department (Appendix A). Approval from William Paterson University Institutional Review Board (IRB) was obtained (Appendix B). There was no risk of harm for patients included in this study. Because this was a minimal risk chart review study, the only concern or risk to the subjects was breach of confidentiality. All necessary measures were taken to minimize this risk as much as possible. Patient's name was replaced with patient identifier numbers and the information obtained from participants remained anonymous. Original data and paperwork with identifiable patient information were shredded after the completion of the project. Benefits to the study participants would be an improvement in early detection of breast cancer by decreasing time from screening to diagnostic imaging which will result in earlier breast cancer diagnosis and reduction of morbidity/mortality.

Data Analysis

Statistical analysis was performed using the Statistical Package for the Social Sciences Software (SPSS 29). The variables of interest for this study were the time interval from email to scheduled appointment (response interval), comprehension, language, preference, and satisfaction with the communication process. The data collected from survey responses and demographic information was exported to Microsoft Excel. Deidentified, coded data were then uploaded to SPSS on an encrypted computer for data analysis.

A one sample t-test was used to compare means between the average 8.6-day pretrial interval at the facility between notice and appointment vs. the mean trial interval. Descriptive statistics were used to summarize the sociodemographics of the participants such as age, highest level of education, and preferred language for receiving results. Comparison of means including

independent sample t-test and one way ANOVA, as well as crosstabs analysis with chi-square test for independence have been utilized.

Bivariate data analysis was used to determine relationships between multiple survey items and the appointment response interval and preferences/satisfaction. Bivariate comparisons included (a) Age and Satisfaction, (b) Response interval and Highest level of education, (c) Response interval and Language, and (d) Response interval and Satisfaction. Regression analysis was also carried out to determine the relationship between age and the response interval. All data was analyzed using SPSS-29.

Summary

This chapter identified the methodology used in evaluating the outcomes centered on the research questions. A research design was established as well as the setting, sample size, and procedure for data collection. The initial screening survey is a written instrument tool that was created by the author and therefore, reliability/validity cannot be measured. Permission to conduct the study was granted from all parties. The proposed data analysis was discussed, and the results of the data collection will be discussed further in Chapter four.

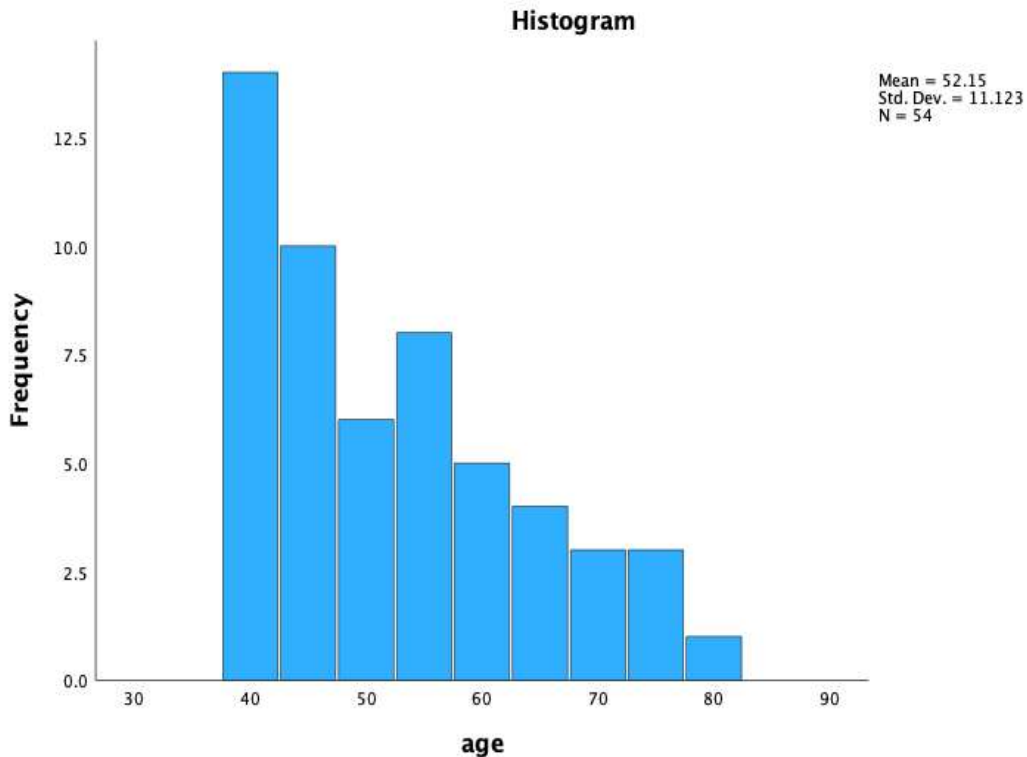
Chapter IV: Results

Chapter 4 examines the collected data from the initial screening survey completed by eligible participants. The survey examined patients' demographics, comprehension of the feedback, language preference, and satisfaction with the mode of presentation. The variables were analyzed in SPSS-29 using frequencies, crosstabulation with chi-square, comparisons of means, and regression. The data collected was used to assess whether level of comprehension, satisfaction, and preference influences a patient's return rate. Correlations between the demographic characteristics such as preferred language, age, education level and the actual responses to preference, satisfaction, and comprehension were examined. SPSS-29 was used to analyze the following bivariate relationships: a) Preferred language and Satisfaction, b) Highest level of education and Preference, c) Highest level of education and Satisfaction, d) Preferred language and Preference, e) Preferred language and Comprehension, f) Education and Comprehension.

Descriptive Characteristics of Participants

Collection of data was suspended in September instead of the projected November 2024 date to a sufficient sample size. A total sample of 645 individuals participated in this survey. Due to incomplete survey responses or non-representation of the target population, 591 participants were excluded from this study. As a result of the study's inclusion criteria, a final sample of 54 (N=54) patients was included in the statistical analysis.

An overview of participant socio-demographic characteristics for age, language, and highest level of education was collected and analyzed using descriptive statistics, including mean and standard deviation for age; frequencies and percentage for education and language. Figure 2 displays the data for age. The mean age was 52.15 (SD = 11.12) with a range from 40 to 80.

Figure 2*Ages of participants*

An overview of participant socio-demographic characteristics is provided in Figures 3 and 4.

Figure 3 displays the descriptive data for language. The preferred language was English for the majority ($n = 29$, 53.7%), Spanish for 12 (22.2%), and Korean for 13 (24.1%). Figure 4 displays the highest level of education. The highest level of education was below high school for 1 (1.9%), high school for 13 (24.1%), college for 27 (50.0%), graduate school for 11 (20.4%), and 2 declined to answer (3.7%).

Figure 3

Preferred language of participants

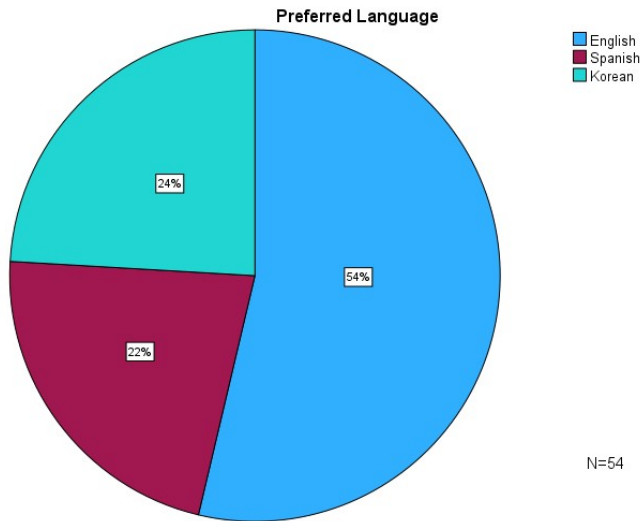
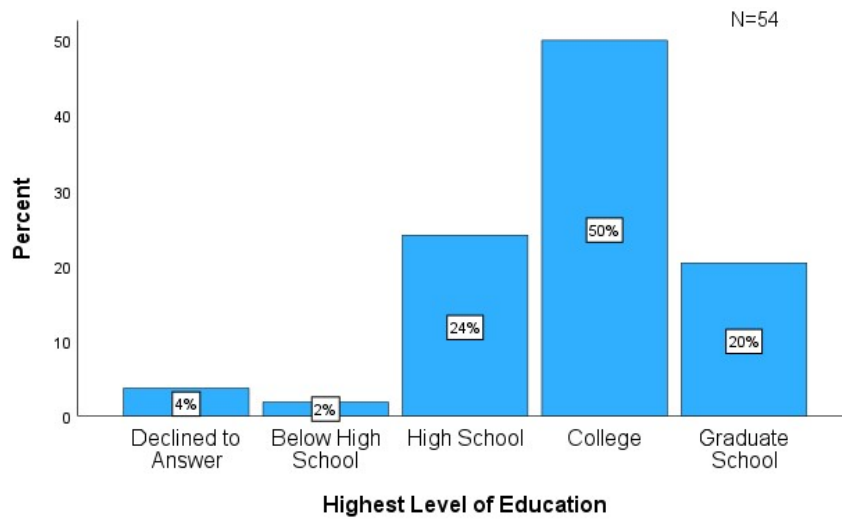


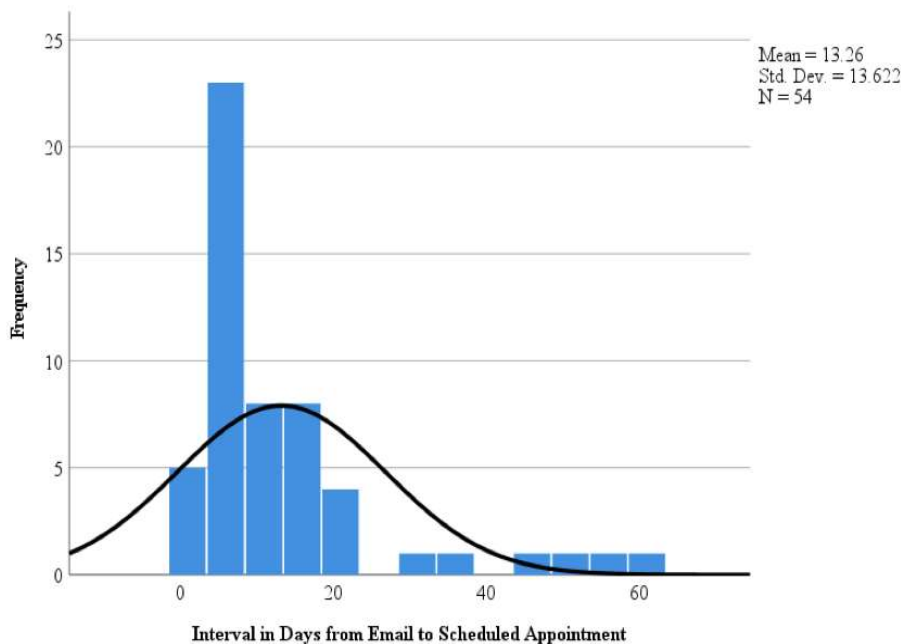
Figure 4

Highest level of education



Research Question 1. What is the relationship between implementation of multilingual video messaging system and follow-up return interval for BI-RADS 0 screening mammogram results?

To address this research question, a one-sample t-test was conducted in IBM SPSS version 29 to compare the mean time in days from email to scheduled follow-up for the study subjects in comparison to the baseline interval for the facility of 8.6 days. The mean time from email to scheduled appointment was 13.26 days ($SD = 13.62$) with a range from 1 to 63 (see Figure 5 & Table 1). When compared to the baseline interval of 8.6 days, this is a statistically significant increase; the average video response interval was 4.7 days longer than overall average $t(53) = 2.51, p = .015$ (see Table 2). However, when removing the three extreme outliers (values that are at least three times the interquartile range above the 75th percentile value) from the data which included intervals of 51 days, 63 days, and 56 days, the results still indicate an increase in the interval, but it is non-significant ($M = 10.71, SD = 8.69$), $t(50) = 1.73, p = .090$ (see Figure 6 and Tables 3, 4).

Figure 5*Histogram of response interval***Table 1***Response interval comparison between traditional method vs. innovative method*

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Interval Email to scheduled appt	54	13.26	13.622	1.854

Table 2*Response interval comparison between traditional method vs. innovative method*

One-Sample Test

	t	df	Significance		Mean Difference
			One-Sided p	Two-Sided p	
Interval Email to scheduled appt	2.513	53	.008	.015	4.659

Test Value = 8.6

Figure 6

Histogram of response interval without outliers

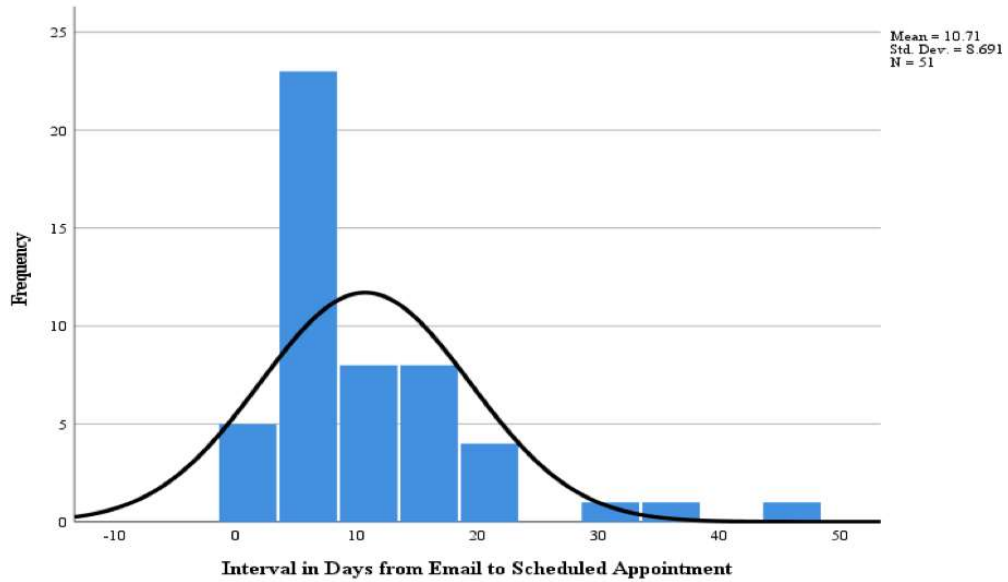


Table 3

Response interval comparison between traditional methods vs. innovative method without outliers

One-Sample Statistics				
	N	Mean	Std. Deviation	Std. Error Mean
Interval Email to Scheduled Appt	51	10.71	8.691	1.217

Table 4

Response interval comparison between traditional methods vs. innovative method without outliers

One-Sample Test					
	Test Value = 8.6				
	t	df	Significance		Mean Difference
			One-Sided p	Two-Sided p	
Interval Email to Scheduled Appt	1.730	50	.045	.090	2.106

A one-way ANOVA was conducted examining response interval vs a) highest level of education and b) language. The ANOVA for response interval time and highest level of education showed no statistical significance ($F=1.646$, $p=.178$). The longest interval was seen among below high school graduates, then graduate school, high school, college, and declined to answer. The ANOVA for response interval vs. language showed no statistical significance with $F=.351$, $p=.705$. The longest interval was seen among Spanish and English speakers, and the fastest interval was seen among the Koreans. As a final step, a regression analysis of the impact of age on the response interval was not statistically significant at $p=.346$. With each additional unit of age, the dependent variable (response interval) decreases by $-.160$ which showed an inverse relationship but was not statistically significant.

Research Question 2. Does delivery of BI-RADS 0 screening mammogram results by video vs. traditional letter or phone call increase patient comprehension, preference, and satisfaction?

To address this question, frequencies and crosstabs with chi square were used for categorical vs categorical variables (e.g. language and preferences); independent sample t-tests were used to examine a) response interval vs. preference and b) age vs. preference; and ANOVA was used to examine satisfaction by age, interval time, language, and education level. Tables and figures are included for ease of interpretation.

Comprehension

For comprehension, 53 (98.1%) answered “yes” and only one (1.9%) answered “no” to the item “Did you find the video messaging easy to understand?” Given the almost non-existent “no” answers, no statistically significant comparisons could be made vs. education or language.

A crosstabulation with chi-square test showed no significant differences between language and comprehension, $\chi^2 (1, N = 54) = .878, p = .645$. The one individual that responded “no” to the item was an English speaker.

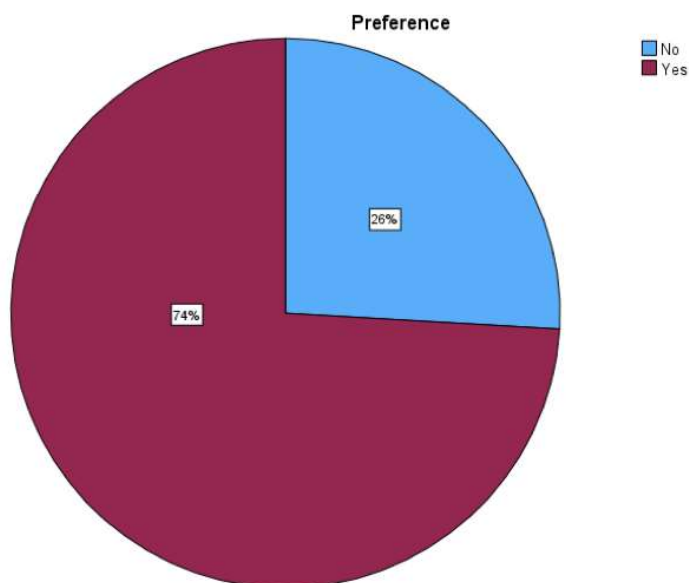
There was also no significant difference between education level and comprehension, $\chi^2 (1, N = 54) = 1.02, p = .907$.

Preference

For preference, 40 (74.1%) answered “yes” and 14 (25.9%) answered “no” to the item “Do you prefer the video messaging method of receiving results over the traditional method of a phone call or letter? The results are displayed in Figure 7.

Figure 7

Pie chart to show the percentage of respondents answering yes and no to the item regarding preference of video messaging over phone call or letter (preference)



A crosstabulation with chi-square test showed a statistically significant difference between language and preference, $\chi^2 (1, N = 54) = 8.69, p = .013$ (see Tables 5 & 6). The results showed the significant difference occurred between respondents with Korean vs. English as their

preferred language. Of the 13 respondents with Korean as their preferred language, all 13 (100%) preferred video messaging, whereas only 17 of 29 (58.6%) of the English-speaking respondents preferred video messaging over traditional methods. Of the 10 out of 12 respondents that chose Spanish as their preferred language, 83% preferred video messaging over traditional methods.

Table 5

Language and Preference Summary

Preferred Language * Preference Crosstabulation

		Preference		Total
		No	Yes	
Preferred Language	English	12	17	29
		85.7%	42.5%	53.7%
	Spanish	2	10	12
		14.3%	25.0%	22.2%
Korean	0	13	13	
		0.0%	32.5%	24.1%
Total		14	40	54
		100.0%	100.0%	100.0%

Table 6

Language and Preference Summary

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	8.692 ^a	2	.013
N of Valid Cases	54		

a. 2 cells (33.3%) have expected count less than 5. The minimum expected count is 3.11.

There was no significant difference between education level and preference, $X^2(1, N = 54) = 7.96, p = .093$. While it is not statistically significant at $p = .093$, 100% below college level preferred the video and 63% of college and higher preferred the innovative method.

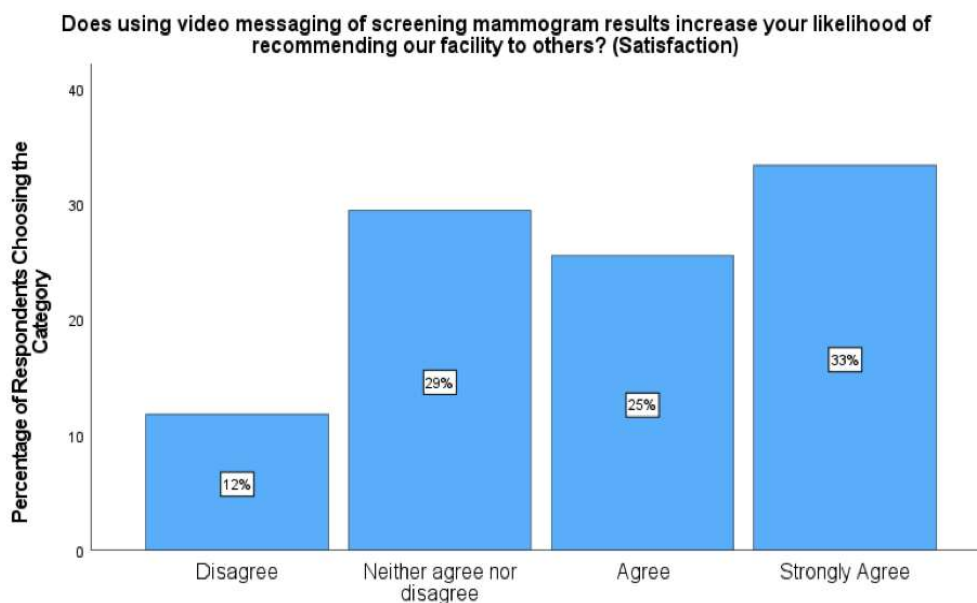
An independent sample t test was used to look for statistical significance between the a) response interval and preference and b) age and preference. Both showed no statistical difference and therefore, null hypothesis was rejected.

Satisfaction

Satisfaction was examined using a Likert scale from 1 (Strongly Disagree) to 5 (Strongly Agree) for an item asking “Does the video messaging system to communicate screening mammogram results increase your likelihood of recommending our facility to others?” The mean for the 51 respondents was 3.80 ($SD = 1.04$) with a range from 2 to 5. A majority (30, 58%) agreed or strongly agreed with the statement, indicating satisfaction with the video messaging (see Figure 8). Three participants did not answer this question on the survey.

Figure 8

Bar chart to show the percentage of respondents choosing each category for the item regarding likelihood of recommending the facility to other (satisfaction)



Crosstabulation with chi-square test showed statistical significance at $p < .001$ between language

and satisfaction (see Tables 7, 8, 9 and Figure 9). The results showed that English speakers were less satisfied and that a strong majority of Korean and Spanish speakers agreed/strongly agreed that receiving results in video format in preferred language and in layman's terms increases satisfaction.

Table 7

Correlation between language and satisfaction

Crosstab

		Preferred Language			Total
		English	Spanish	Korean	
Satisfaction	Disagree	5	1	0	6
		19.2%	8.3%	0.0%	11.8%
	Neither agree nor disagree	13	1	1	15
		50.0%	8.3%	7.7%	29.4%
Agree		6	1	6	13
		23.1%	8.3%	46.2%	25.5%
Strongly Agree		2	9	6	17
		7.7%	75.0%	46.2%	33.3%
Total		26	12	13	51
		100.0%	100.0%	100.0%	100.0%

Table 8

Correlation between language and satisfaction

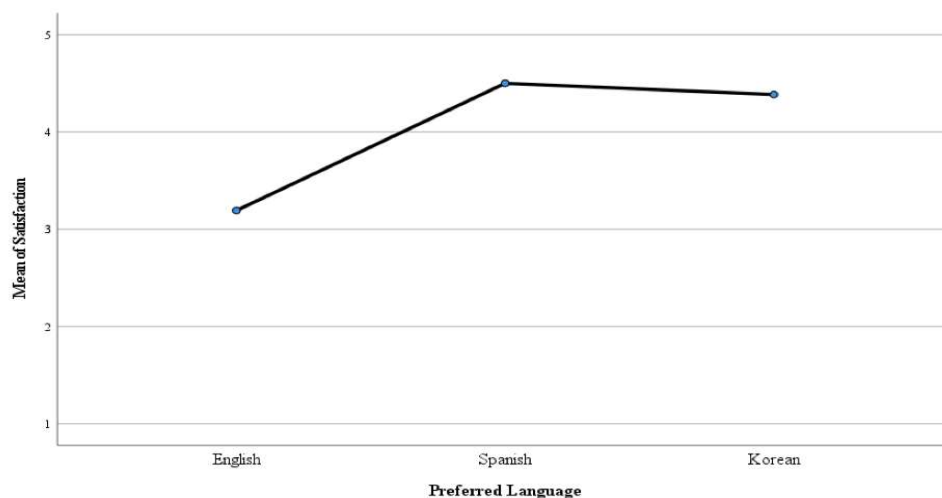
Preferred Language * Satisfaction Crosstabulation

		Satisfaction				Total
		disagree	neither agree nor disagree	agree	strongly agree	
Preferred Language	English	5	13	6	2	26
		83.3%	86.7%	46.2%	11.8%	51.0%
	Spanish	1	1	1	9	12
		16.7%	6.7%	7.7%	52.9%	23.5%
Korean	0	1	6	6	13	
	0.0%	6.7%	46.2%	35.3%	25.5%	
Total		6	15	13	17	51
		100.0%	100.0%	100.0%	100.0%	100.0%

Table 9*Correlation between language and satisfaction*

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	26.168 ^a	6	<.001
N of Valid Cases	51		

a. 9 cells (75.0%) have expected count less than 5. The minimum expected count is 1.41.

Figure 9*Preferred language and satisfaction*

Crosstabulation with chi-square test showed no statistical significance, $p = .151$ between highest level of education and satisfaction. There were significant differences between below high school and graduate school respondents on satisfaction, with below high school educated respondents having a significantly higher mean score at 100% for satisfaction than graduate school respondents. The order of satisfaction from highest to lowest are as follows: Below high school, high school, declined to answer, college, graduate school, and are displayed in Tables 10, 11 & Figure 10.

Table 10*Correlation between highest level of education and satisfaction*

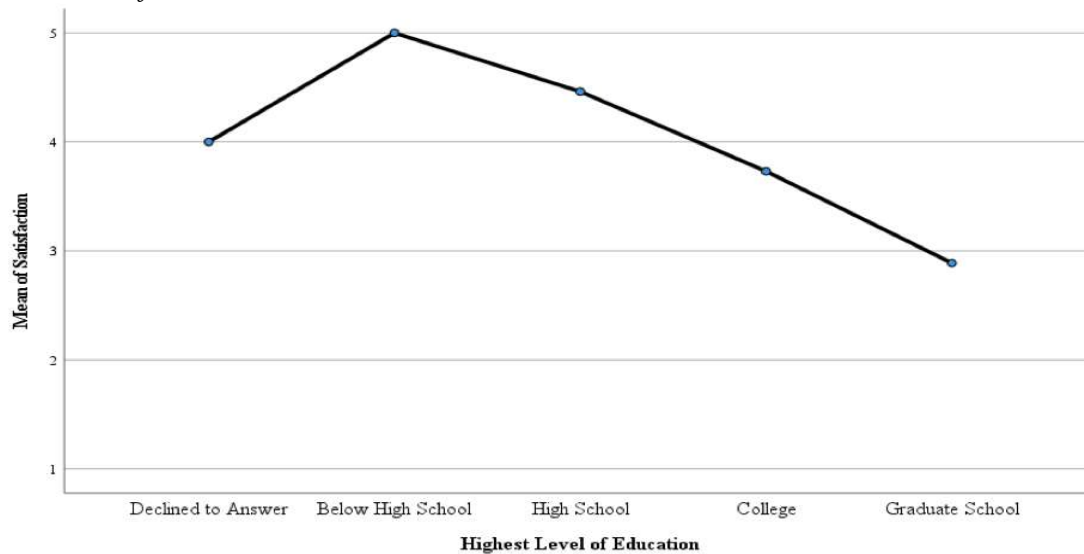
Crosstab

		Highest Level of Education					Total
		Declined to Answer	Below High School	High School	College	Graduate School	
Satisfaction	Disagree	0	0	0	3	3	6
		0.0%	0.0%	0.0%	11.5%	33.3%	11.8%
	Neither agree nor disagree	1	0	1	9	4	15
		50.0%	0.0%	7.7%	34.6%	44.4%	29.4%
Agree		0	0	5	6	2	13
		0.0%	0.0%	38%	23.1%	22.2%	25.5%
Strongly Agree		1	1	7	8	0	17
		50.0%	100.0%	54%	30.8%	0.0%	33.3%
Total		2	1	13	26	9	51
		100.0%	100.0%	100%	100.0%	100.0%	100.0%

Table 11*Correlation between highest level of education and satisfaction***Chi-Square Tests**

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	16.953 ^a	12	.151
N of Valid Cases	51		

a. 17 cells (85.0%) have expected count less than 5. The minimum expected count is .12.

Figure 10*Education and satisfaction*

A one-way ANOVA was conducted for both age vs. satisfaction and response interval vs. satisfaction. The ANOVA for age and satisfaction was not statistically significant ($F=.940$; $p=.429$). The ANOVA for response interval and satisfaction was not statistically significant ($F=1.287$; $p=.290$). The shortest interval was for disagree (7.3 days) and agree (8.54 days). Longest interval for strongly agree (14.82 days).

Summary

The results of the analysis presented in chapter 4 indicated that Research Question 1 was not supported. Although the hypothesis that multilingual prerecorded video messages would positively influence response interval was not firmly supported, patient feedback did indicate that the use of layman's terminology and use of preferred language had a significant impact on patient satisfaction almost unanimously for non-English speakers.

In addition, there was statistical significance at $p<.001$ between language and satisfaction. The results showed that English speakers were less satisfied and Korean and Spanish speakers vastly agreed/strongly agreed that receiving results in video format in their preferred language and in layman's terms increases satisfaction. Furthermore, a chi-square test showed a statistically significant difference between language and preference, $\chi^2(1, N = 54) = 8.69, p = .013$. Of the 13 respondents with Korean as their preferred language, all 13 (100%) preferred video messaging, whereas only 17 of 29 (58.6%) of the English-speaking respondents preferred video messaging over traditional methods. Of the 10 out of 12 respondents that chose Spanish as their preferred language, 83% preferred video messaging over traditional methods. In weighing comprehension against other demographic characteristics, there were essentially no differences. Only one respondent chose “no” as an answer.

Chapter V

Introduction

This study aimed to assess the impact of prerecorded video message of BI-RADS 0 results in decreasing turnaround time of screening to diagnostic mammogram. Secondly, this study reviewed patients' comprehension and preference in interpreting radiology reports, where the reports were presented in preferred language with layman translations. Patient satisfaction was also examined in receiving radiology results by traditional methods vs. innovative methods.

Interpretation of Results

In total, 54 participants (N=54) enrolled in the study and the mean age was 52.15 (SD = 11.12) with a range from 40 to 80. Over 50% of participants had some college education and the bulk of participants (58%) strongly agreed or agreed that they were satisfied with receiving results by video in their preferred language and in layman's terms.

The results of this study showed that the implementation of a multilingual video messaging system average turn around interval was 13.26 days (SD = 13.62) compared to the baseline interval of 8.6 days. This was a statistically significant increase $p = .015$ and therefore, the study did not show a decrease in turnaround time. The increased turnaround could partially be attributed to the extra step needed in obtaining a follow-up appointment. When results are given by phone, the call is transferred directly to the scheduling department and a follow up appointment is made. However, since videos were sent by email, patients had the additional step of calling to schedule their appointments leading to an increased turnaround time. Furthermore, not all patients check emails on a daily basis and emails may have been delivered as junk or spam mail, negatively impacting participants from reviewing and scheduling necessary follow up appointments. The longest interval was seen among below high school graduates, then graduate

school, high school, college, and declined to answer. In addition, the longest interval was seen among Spanish and English speakers and the fastest interval was seen among the Koreans.

The results also showed that English speakers were less satisfied, and a strong majority of Korean and Spanish speakers agreed/strongly agreed that receiving results in video format in preferred language and in layman's terms increases satisfaction. Furthermore, below high school educated respondents had a significantly higher mean score at 100% for satisfaction than graduate school respondents. Interestingly however, those patients who indicated they were dissatisfied with the method of receiving results made their follow up appointments in a shorter period of time (7.3days) than those who indicated they were highly satisfied (14.82 days). Those dissatisfied may have wanted more detailed information regarding their results, leading them to consult with their referring provider and therefore resulted in shorter response interval.

In a seminal study by Dolan et al. (2001), 23% of those with abnormal screening mammograms necessitating further follow-up either did not recall their follow-up recommendations or believed they could return to annual or routine screening. However, with the use of video messaging system, all but 1 respondent (98.1%) answered “yes” to understanding video in layman's terms. This finding is consistent with Wieland et al. (2022) who also found that the use of layman’s terms in radiology report enhances patients’ understanding of radiology reports.

Lee et al. (2016) found that most patients were dissatisfied with the customary reporting of radiology results, citing delays leading to excessive anxiety and stress and little detail when radiologic findings are relayed orally by a referring physician. When examining preference, 100% of Koreans preferred video messaging, 83% of Spanish speakers preferred video messaging over

traditional methods, and 58.6% of the English-speaking respondents preferred video messaging over traditional methods.

When looking at education level, 100% below college level preferred the video and 63% of college and higher preferred the innovative method. These findings are supported by Gunn et al. (2017) who found that the reported general understanding of radiology reports is low despite of the level of education attained by subjects, even in a study population with a comparatively high level of education.

Discussion

The National Academy of Sciences, Engineering and Medicine (NASEM) released *The Future of Nursing 2020–2030: Charting a Path to Health Equity* (FON 2030) in May 2021 (Rivera-Burciaga et al., 2022). At the heart of the FON 2030 is the principle that our nation cannot prosper unless there is a spotlight on health and wellness for all people. The LEP population is increasing in the United States at high rates and people with LEP have inferior access to care and poorer health outcomes than people proficient in English (Cataneo et al., 2023). In addition, about 17% of the US adult population, and a third of the adults 65 and over have a “below basic” health literacy level and practices that improve understanding among patients of all literacy levels are critical (Cataneo et al., 2023).

While the risk of complications and poor patient outcomes has increased to all individuals seeking care, those from oppressed groups are even more susceptible to complications originating from a lack of cultural sensitivity and poor communication (Rivera-Burciaga et al., 2022). Language barriers have been shown to have a harmful effect on quality of care and this has been correlated with a reduction in question asking behaviors, lack of comprehension regarding instructions, and decreased satisfaction (Cataneo et al., 2023).

Including bilingual workforce that offer clinical, cultural, and linguistic competence as well as improved technology to allocate translated materials through patient portals and use of virtual video technology can enhance rates of interpretation and better support the LEP population (Barreto et al., 2021). Understanding and addressing key cultural and structural barriers present in minority groups is of principal importance to attain equal access to cancer prevention and early detection interventions.

Conclusion

Of the components of result reporting, verbal lucidity in layman's terms and in preferred language had an important impact on satisfaction. Therefore, interventions to enhance the lucidity with which mammography results are explained might be a significant approach to enhancing comprehension and satisfaction with screening mammogram results reporting. Furthermore, such interventions could have the supplementary advantage of decreasing patients' confusion about their mammogram results and follow-up recommendations. Enhanced verbal communication of results with sensitivity to patients' medical literacy level and understanding are possible strategies that warrant additional thought.

Implications for practice

While social determinants of health (SDoH) can have both positive and negative outcomes on the health and well-being of individuals and communities, the load of negative SDoH falls inexplicably on oppressed groups (Rivera-Burciaga et al., 2022). Research suggests that communication and language barriers, unconscious bias from providers, and lack of cultural sensitivity are causes for disparities (Rivera-Burciaga et al., 2022).

This study builds on the small quantity of accessible research on patient preference regarding the content of radiology reports which are not well understood by patients regardless

of the level of education who recognized the technical language and long length of the reports as the most common problems affecting patient comprehension (Gunn et al., 2017). A report intended as professional communication between physicians may not be able to address patient needs without the existence of some kind of liaison mechanism to translate the findings. One solution would be to create a second report in the patient portal presented in layman's terms. Incorporating a prerecorded video summary of essential findings in patients' preferred language at the end of the report may empower patients by improving their understanding of follow-up requirements.

As the health care system undergoes a paradigm shift to a system that is more patient centered, increasing emphasis will be placed on patient requirements and expectations. Social mission includes a set of thoughts and approach aimed at promoting health equity within the multifaceted and ever-changing healthcare system. As the field of radiology continues shifting to embrace the viewpoint of patient primacy, it will be significant to weigh the effect of radiology reporting practices on patient care. At the very least, radiology practices should be aware of and should mirror compassion toward patient preferences when formulating their reports.

Limitations

There were several limitations identified in this research study. Enrollment in the study was limited to one health care system which could potentially limit the ability to extrapolate the findings to other health care systems. Additionally, this study utilized a limited number of participants and therefore, results cannot be generalized. Although the study population was diverse, it included 22% Spanish speakers, and 24% Korean speakers, English speakers at 53% comprised the largest group. The diversity of education was also explored. 50% of participants

had a college education, higher than the national average value of 32.5% (Gunn et al., 2017). These two areas can affect generalizability.

Another limitation identified is the release of radiology results. Results are automatically sent to patients through the electronic portal (*MyChart*), independent of whether a provider has directly communicated those results with the patient. Although study participants were aware that follow up recommendations would be sent by email from the author, some participants had already scheduled their follow up appointment based on results seen on *MyChart*. Others made appointments based on notification from referring providers, limiting them as participants. Furthermore, not all patients check e-mails daily and e-mails may have been delivered as junk or spam mail, negatively impacting all recipients from reviewing and scheduling follow up appointments. This issue persisted over time and proved difficult to resolve. If patients did not schedule follow up appointments after 2 days had lapsed since emails were sent out, patients were called to return for safety reasons.

Future research

In the past, radiologists were required to center on communicating with the health care team. This model has shifted in modern years owing to amplification in both patients' awareness in accessing their medical records and the technological capacity to do so. However, unclear language was cited as the most frequent problem with radiology reports as recognized by patients (Mityul et al., 2017). Radiologists now require consideration of how the radiology report will be interpreted by both referring providers and patients. The findings show that although patients increasingly have direct, timely access to their imaging results, an inconsistent understanding of the written report may reduce patients' engagement in their own health care (Mityul et al., 2017).

This study aligns with the objective of DNP Essential II: Organizational and Systems Leadership for Quality Improvement and Systems Thinking and VIII: Advanced Nursing Practice. APNs have the skill to operate as a key element in developing new models of health care and encourage organizational transformation by utilizing a multidisciplinary approach.

DNP Essential III: Clinical Scholarship and Analytical Methods for Evidence-Based Practice offers skills to critically assess and use evidence-based practice as a problem-solving approach to clinical practice by incorporating evidence to guide nursing practice. Proper follow-up is an essential part of the diagnostic process and necessary for the delivery of quality patient care. Strategies to enhance test result follow-up include the use of health information technology (IT) for the communication of results through the patient portal. Locsin's (n.d.) Technological Competency as Caring in Nursing Theory offers a strategic technological improvement that can be beneficial in constructing and upholding a healthier process for preferred change and centers on human behaviors and requirements of change.

Successful change is an effect of interdepartmental teamwork and communication as well as shared support among all staff and departments (Tetef, 2017). DNP Essential V: Health Care Policy for Advocacy in Health Care critically examines health policy and proposals from the viewpoint of consumers, nursing, other health professions as well as other stakeholders. Essential VI: Interprofessional Collaboration for Improving Patient and Population Health Outcomes addresses effectual communication and collaborative skills that are key in the growth and implementation of practice guidelines, health policy, and standards of care. The APN will lead interprofessional teams in the analysis of intricate practice and organizational problems using leadership skills among the interprofessional teams to make transformations in health care systems. By leveraging consumer information based on data trends and patterns, the level of

health ownership and health status are better understood which are then used to educate, develop, and provide the upmost quality services.

This study supports the advantage of including lay interpretations in preferred language for radiology reports practices. Future directions include continuing efforts to work directly with radiologists to form a standardized methodology to interpret the intricate radiological report to a level that is comprehensible by the average patient. Additional investigations regarding how patients comprehend and understand report terminology are warranted as a tool to enhance reporting practices. Therefore, focus group discussions will be utilized to elicit meaningful opinions, suggestions, and feedback in a collective manner. The researcher will also plan to expand and incorporate a larger sample size for an extended period of time.

Results of this study emphasize a developing part of reporting practices for all radiologists and serve as a significant memento that care should be taken to guarantee that the diagnostic intent of the report is communicated efficiently to all involved parties. As we make the change to a value-based health care system, this modern study can serve as a starting point for radiologists as healthcare seeks to advance the service we render to our patients.

Summary

This chapter has presented the conclusion of this research project, implications for practice, limitations, interpretation of results, and recommendations for future research. This pilot study serves as evidence of the notion of a practical and patient-centered method to improve reporting practices. A similar mechanism could be implemented via online patient portals as part of a quality improvement program of radiology practice. An optimal radiology reporting process would allow patients to ease their understanding of their imaging result while preserving the function of the report as an interprovider communication.

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Appendices

Appendix A

Englewood Health Permission for Implementation of the Project

**ENGLEWOOD
HOSPITAL**

Protocol Title:

"Prerecorded Video Messages for Screening Mammogram Results in the Digital Age: A Pilot Study"

To whom it may concern,

This note to file is to confirm that the above mentioned protocol title was submitted on February 6, 2024 for IRB review.

After a preliminary review and discussion, it was determined that from a research perspective, this submission did not require IRB approval.

Thank you,

x. Nicholas Cavalieri
Coordinator,
Institutional Review Board

6/6/2024
Date

Appendix B

William Paterson University Institutional Review Board Approval

THE WILLIAM PATERSON UNIVERSITY OF NEW JERSEY INSTITUTIONAL REVIEW BOARD FOR HUMAN SUBJECT RESEARCH	
c/o Office of Sponsored Programs 1800 Valley Road, Room 222 973-720-2852 (Phone) 973-720-3573 (Fax) http://www.wpunj.edu/osp/	Chair: Professor Michelle Gonzalez (GonzalezM77@wpunj.edu) College of Education Contact: Kate Boschert (irbadministrator@wpunj.edu) Office of Sponsored Programs

To: Susan Song
 Doctoral Candidate of Nursing

From: Michelle Gonzalez

Subject: IRB Determination: Exempt Review

Study: Protocol # 2024-345: Initiating Prerecorded Video Messages for BI-RADS 0 Screening Mammogram Results in the Digital Age: A Pilot Study.

Date: June 11, 2024

The IRB has reviewed the above study involving humans as research subjects. **This study was determined to be Exempt from further review under Category: Exempt 45 CFR 46.104(d)(2)(i)**; special class of subjects: None. However, you must still submit protocol modifications to the IRB.

IRB Number: This number is WPU's IRB identification that should be used on all consent forms and correspondence.

Review Date: 06/11/2024

Revisions/Modifications: You are required to carry out this research as described in the protocol. All amendments/modifications of protocols involving human subjects, must have prior IRB approval, except those involving the prevention of immediate harm to a subject. Revisions/Modifications are to be submitted through InfoReady at <https://wpunj.infoready4.com/>.

Adverse Effects/Unanticipated Problems: The principal investigator must report immediately any serious problem, adverse effect, or outcomes that are encountered while using human subjects or any complaints from your subjects. In addition, the principal investigator must report any event or series of events that prompt the temporary or permanent suspension of a research project involving human subjects or any deviations from the approved protocol using the Adverse Effects Form. Adverse Effects, Unanticipated Problems, and Modifications for the prevention of immediate harm to subjects must be reported within 24 hours to the IRB using the Adverse Effects Form: <https://www.wpunj.edu/osp/irb/irb-forms.html>.

Consent Form: All research subjects must use the approved Informed Consent Form. You are responsible for maintaining signed consent forms (if approved for Active Consent format) for each research subject for a period of at least three years after study completion.

Records/Documentation: You are required to keep detailed records concerning this research project and appropriate documentation concerning Informed Consent in a readily accessible location for a period of not less than three (3) years. The IRB reserves the right to inspect all records, research tools and databases that are associated with this research.

If you have any questions, please do not hesitate to contact Kate Boschert at 973-720-2852 or irbadministrator@wpunj.edu, or the IRB Committee Chairperson, Dr. Michelle Gonzalez, at GonzalezM77@wpunj.edu.

Appendix C
Initial Screening Survey
English Version

Hello,

My name is Susan Song. I am a nurse practitioner at the breast center and doctoral student at William Paterson University. Sometimes radiologists will recommend additional imaging following a screening mammogram for further evaluation, but it does not necessarily mean anything is wrong.

When this happens, patients are notified via a phone call from the breast center or through MyChart. I am conducting a pilot study on the effects and satisfaction of providing VIDEO results in these circumstances. Participation is voluntary and you may stop completing this survey at any time.

IF you participate in this study and IF we need you to return for additional imaging after your screening mammogram, your results will be emailed to you in video format from susan.song@ehmchealth.org.

Along with the video message, you will receive a short, 3 question satisfaction survey to complete. The responses will be stored in a password-protected computer, number-coded, and will remain confidential.

Your participation would be greatly appreciated in improving patient care.

If you would like to participate in this pilot study, please fill out the following:

Name: _____ Date of Birth: _____

Email: _____ Occupation: _____

Highest Level of Education: _____

Preferred language: English Korean Spanish

Korean Version

안녕하세요,

저는 유방 센터의 전문 간호사이자 윌리엄 패터슨 대학교의 박사 과정수료 학생인 **Susan Song** 입니다.

때론 방사선과 전문의는 추가 평가를 위해 추가 영상 촬영을 권장하지만 이것이 반드시 문제가 있음을 의미하지는 않습니다. 이런 경우에는 유방센터에서 전화나 마이차트(MyChart)를 통해 환자에게 통보합니다.

이러한 상황에서 비디오 결과 제공의 효과와 만족도에 대한 파일럿 연구를 진행하고 있습니다. 참여는 자발적이며 언제든지 이 설문 조사 작성을 중단하실수 있습니다.

귀하가 이 연구에 참여하고 유방촬영술 검사후 추가 영상 촬영을 위해 다시 방문해야 하는 경우, 결과는 susan.song@ehmchealth.org 에서 비디오 형식으로 귀하의 이메일로 전송됩니다.

영상 메시지와 함께 3 개의 간단한 만족도 설문조사를 보내드립니다.

응답 내용은 비밀번호로 보호된 컴퓨터에 숫자로 구분되어 저장되며 기밀로 유지됩니다.

환자 진료를 개선하는 데 귀하의 참여를 부탁드립니다.

본 파일럿 연구에 참여하고 싶다면 다음 사항을 작성해 주세요.

이름: _____ 생년월일: _____

이메일: _____ 직업: _____

최고 학력: _____

선호하는 언어: 영어 한국어 스페인어

Spanish Version

Hola,

Mi nombre es Susan Song. Soy enfermera practicante en el centro de mama y estudiante de doctorado en la Universidad William Paterson.

A veces, los radiólogos recomendarán imágenes adicionales después de una mamografía de detección para una evaluación adicional, pero eso no significa necesariamente que algo esté mal. Cuando esto sucede, se notifica a los pacientes mediante una llamada telefónica desde el centro mamario o mediante MyChart.

Estoy realizando un estudio piloto sobre los efectos y la satisfacción de proporcionar resultados en VIDEO en estas circunstancias. La participación es voluntaria y puede dejar de completar esta encuesta en cualquier momento.

SI participa en este estudio y SI necesitamos que regrese para obtener imágenes adicionales después de su mamografía de detección, sus resultados le serán enviados por correo electrónico en formato de video desde susan.song@ehmhealth.org.

Junto con el mensaje de video, recibirá una breve encuesta de satisfacción de 3 preguntas para completar.

Las respuestas se almacenarán en una computadora protegida con contraseña, codificadas con números y permanecerán confidenciales.

Su participación sería muy apreciada para mejorar la atención al paciente.

Si desea participar en este estudio piloto, complete lo siguiente:

Nombre: _____ Fecha de nacimiento: _____

Correo electrónico: _____ Ocupación: _____

El mas alto nivel de educación: _____

Idioma preferido: Inglés Coreano Español

Appendix D
Tracking Form

MRN #:

Age:

Preferred Language: English Korean Spanish

Initial Screening mammogram date:

Date/time email with video sent:

Return date:

Question #1 answer:

Question #2 answer:

Question #3 answer:

Appendix E

Video Script

English Version

Hi, my name is Maureen APN. Our radiologist has finished reviewing your mammogram images and is asking that you return for some additional imaging. She would like to look at a certain area of your breast from a different perspective.

Please do not be alarmed, this does not mean anything is wrong. To schedule this important follow-up appointment please call our imaging scheduling team at 201-894-3622. Again, that's 201-894-3622.

Thank you for being part of this pilot study looking at the use of a video for sharing test results.

Please take a moment and respond to this email by answering the three questions listed below.

If you are not the person who this video is meant for, please delete this video.

Thank You!

Korean Version

안녕하세요. 저는 전문간호사 Susan Song 입니다. 저희 방사선 전문의가 귀하의 유방 mammogram 이미지 검토를 마쳤으며 추가 이미지 촬영을 위해 재방문을 요청하고있습니다. 다른 관점에서 유방의 특정 부위를 보고 싶어합니다. 놀라지 마십시오. 문제가 있다는 의미는 아닙니다.저희 이미징 예약 팀에 전화하십시오. 이 중요한 예약번호는 201-894-3622 입니다. 다시 말씀드리지만 201-894-3622 입니다. 테스트 결과를 공유하기 위한 비디오 사용을 검토하는 이 파일럿 연구에 참여해 주셔서 감사합니다. 잠시 시간을 내어 아래 나열된 세 가지 질문에 답하여 이 이메일에 답변해 주시기 바랍니다. 이 영상의 대상이 본인이 아니라면 이 영상을 삭제해주세요. 감사합니다!

Spanish Version

Hola, mi nombre es Sylvia Colon Cabassa Enfermera practicante avanzada. Nuestro radiólogo ha terminado de revisar las imágenes de su mamografía y le solicita que regrese para obtener algunas imágenes adicionales. A ella le gustaría observar cierta zona de su seno desde una perspectiva diferente. Por favor, no se alarme, esto no significa que algo vaya mal. Para programar esta importante cita de seguimiento, llame a nuestro centro de llamadas del equipo de programación de imágenes al 201 894-3622. De nuevo, es 201 894-3622. Gracias por ser parte de este estudio piloto que analiza el uso de un video para compartir los resultados de las pruebas. Tómese un momento y responda a este correo electrónico respondiendo las tres preguntas que se enumeran a continuación. Si no eres la persona a la que está destinado este vídeo, elimina este vídeo. ¡Gracias!

Appendix F

Post Video Survey

English Version

Please respond by e-mail AFTER watching the video. Please click “Reply” and bold your answers or manually type your answers to respond.

1. Did you find the video messaging easy to understand? yes no
2. Do you prefer the video messaging method of receiving results over the traditional method of a phone call or letter? yes no
3. Does the video messaging system to communicate screening mammogram results increase your likelihood of recommending our facility to others?

Strongly disagree Disagree Neither agree nor disagree Agree Strongly Agree

Korean Version

영상 시청 후 susan.song@ehmchealth.org 로 회신 부탁드립니다 .

1. 영상 메시지가 이해하기 쉬웠나요? 예 아니오
2. 기존의 전화나 편지 방식보다 결과를 받는 영상 메시지 방식을 선호하시나요?
예 아니오
3. 선별 검사 결과를 영상 메시지로 보내면 우리 시설을 다른 사람에게 추천할 가능성이 높아집니다.
전적으로 반대함 반대함 동의하지도 반대하지도 않음 동의함 전적으로동의함

Spanish Version

Haga clic en Responder y escriba sus respuestas en negrita o escriba manualmente sus respuestas responder.

1. ¿Le resultaron fáciles de entender los mensajes de vídeo? sí no

2. ¿Prefiere el método de mensajería de video para recibir resultados en lugar del Método tradicional de una llamada telefónica o una carta? sí no

3. ¿El uso de mensajes de video sobre los resultados de la mamografía de detección aumenta su probabilidad de recomendar nuestro centro a otras personas?

Fuertemente discrepar Discrepar Ninguno de los dos está de acuerdo ni en desacuerdo Aceptar Totalmente de acuerdo