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IMPROVING OSTEOPOROSIS SCREENING RATES OF WOMEN IN A PRIMARY CARE SETTING

by

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EVIDENCE-BASED PRACTICE PROJECT REPORT

Submitted to the College of Nursing and Health Professions

of Valparaiso University,

Valparaiso, Indiana

in partial fulfillment of the requirements

For the degree of

DOCTOR OF NURSING PRACTICE

2022

Kristine E. Davis. 5/5/2022		Mackenzie Shireman. 5/5/2022	
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DEDICATION

This evidence-based project is dedicated to my supportive, loving, patient husband, Clint. You have always been by my side and because of you, we are accomplishing things I never would have dreamt I could accomplish without you by my side. Without your *constant* understanding, this personal dream would not have been possible. To my children Jack, Rhett, and Annie, may you always follow your dreams and get your education. I always dreamt of a family of my own and my path has never been and never will be solely for myself. To my mother, thank you for your unconditional love and support of my goals. Your sacrifices throughout the years do not go unnoticed. To my sister Natalie, thank you for your constant encouragement. To my father, thank you for your everlasting support. To my grandparents, I know this has made you proud.

ACKNOWLEDGMENTS

This evidence-based project would not have been possible without my advisors, Dr. Julie Koch and Dr. Mackenzie Shireman. Both have been extremely helpful and supportive throughout my project development. Dr. Berger and Mackenzie Shireman, thank you for your guidance throughout my journey. All key stakeholders at the project site have helped contribute to my success of my project. Thank you, Liz Fisher with Goshen Health marketing team. Thank you to Gregory Gilbert, who helped tremendously with statistical data analysis.

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ABSTRACT

Osteoporosis is caused by caused by low bone mass, microarchitecture disruption and increase in skeletal fragility (Rosen & Drezner, 2021). This disease presents as a silent disease without any clinical manifestations and increases risk for bone fracture. The purpose of this Evidence-Based Practice (EBP) project was to increase screening rates for osteoporosis in the female population by mailing a patient reminder letter to the home of qualifying patients in the primary care setting and to determine if mailing a patient reminder letter would increase screening rates. The Johns Hopkins Evidence-Based Practice for Nurses and Healthcare professionals (JHEBP) model was used as a framework to guide the project for the 77 females at a small primary care clinic in northern Indiana. After organizational approval of this EBP project, letter reminders were created and mailed to those females who were 65 years and older and who did not have a reported DXA screen on their electronic medical record. To determine if the mailed reminder was effective, data was collected from the literature evidence pieces and then compared to the post-intervention group data. The data was analyzed using the binomial test in an effort to determine the effectiveness of the patient mailed reminder letter. Implications for practice to be discussed.

CHAPTER 1

INTRODUCTION

Background

Osteoporosis is a *"silent"* disease that is categorized by low bone mass, disruption of microarchitecture, and increased skeletal fragility (Rosen & Drezner, 2021). Bone homeostasis is dependent upon the formation of bone by osteoblasts and the resorption of bone by osteoclasts; the imbalance of these tightly linked processes leads to osteoporosis (Chen et al., 2018). Bone is constantly in the remodeling state and maintaining normal skeletal structure is important for function. Any impaired remodeling process can create an imbalance of the bone leading to a diagnosis of osteoporosis. Osteoporosis is considered a silent disease because there are no clinical manifestations until there is a fragility fracture (National Osteoporosis Foundation [NOF], 2021a). Fractures at the hip, spine or wrist are the most common places this can occur (United States Preventive Services Task Force [USPSTF], 2018). Chronic pain, limited mobility, disability, deformity, depression and isolation can all result from a fracture.

A number of factors are related to osteoporosis: estrogen deficiency in post-menopausal women (including advanced age), low body mass index, cigarette smoking, excessive alcohol consumption, and prolonged glucocorticoid therapy (Rosen & Drezner, 2021). Given these risk factors, it is not surprising to note that 54 million women in the United States have been diagnosed with osteoporosis or osteopenia (USPSTF, 2018), and the annual number of fragility fractures exceeds 2 million.

The overall costs related to osteoporosis have been estimated at $19 billion (USPSTF 2018). Healthcare plans pay an estimated mean of $34,855 per patient who experiences an osteoporotic fracture (Williams et al., 2020). The economic burden associated with fractures stresses the importance of early identification of “at risk” individuals with preventive care.

Given the economic impact and knowledge of the underlying disease processes, the USPSTF has developed recommendations for osteoporosis screening in women. Current national guidelines recommend that all women age 65 years and older undergo a bone mineral density (BMD) test to screen for osteoporosis, a Grade B recommendation (USPSTF, 2018). Within their recommendation statement on screening for osteoporosis, the USPSTF (2018) has noted that bone measurement tests are accurate for detecting osteoporosis and for forecasting fractures in the population of women 65 years and older. Thus, BMD screening will help serve to prevent osteoporotic fractures (USPSTF, 2018). With recommended preventative screening in women, the US estimated osteoporosis associated cost of $25.3 billion annually will ideally decrease (USPSTF, 2018).

Dual-energy x-ray absorptiometry (DXA) is the most common tool used for diagnosing BMD of relevant skeletal sites (hip and spine) (USPSTF, 2021), and has a sensitivity of 88.2% for detecting osteoporosis (Humadi et al., 2010). The DXA scan is noninvasive and can be done at a local hospital. Within a DXA scan, dual energy photon beams distinguish between soft tissue and quantify bone mineral density. Bone density is quantified by measuring bone mineral content in grams and bone area in centimeters, then calculated by dividing bone mineral content by bone area (Lewiecki, 2021). The calculated BMD is represented by T-score which analyzes an individual's bone mass and compares it to that of a healthy 30-year old adult (American Bone Health, 2020). The individuals bone mass is reported as the number of standard deviations from the mean score of the healthy adult (T-scores).

The International Society for Clinical Densitometry (ISCD) has advised the World Health Organization (WHO) to use the lowest T-score of either the lumbar spine, femoral neck or total proximal femur to determine if they fall into the category of normal, osteopenia or osteoporosis (Lewiecki, 2021). Normal bone density T-scores range from 1.0 to -1.0 (Johns Hopkins, 2021). BMD T-scores ranging from -1.0 to -2.4 indicate low bone mass or osteopenia (Johns Hopkins,

2021). T-scores of -2.5 or lower indicate the presence of osteoporosis and are associated with the highest risk of fracture (Lewiecki, 2021).

Data Supporting Need for the Project

National Data

As noted previously, the national impact of altered bone mineral density is significant, with more than 50 million women diagnosed with osteoporosis or osteopenia (USPSTF, 2018). An estimated 1 of 2 women will develop osteoporosis in their lifetime; this incidence rate is higher than that of myocardial infarction (NOF, 2021b). Women with decreased BMD are at risk for developing the fragility fractures that effect more than 2 million women, primarily those age 65 years and older. As the number of older adults within the US population continues to rise, the number of fragility fractures from osteoporosis is anticipated to increase to 3 million by 2025 (USPSTF, 2018).

Currently, the overall costs related to osteoporosis have been estimated at $19 billion (NOF, 2021a; USPSTF, 2018), but the aging US population is anticipated to create a challenge to Medicare, as the organization assumes the majority of costs of osteoporosis care. Thus, the prevention of osteoporosis and the associated morbid consequences are a national initiative, with recommended screening and implementation of interventions by healthcare providers (Dempster, 2011).

Clinical Agency Data

The practice setting for this evidence-based practice (EBP) project will take place in a small community setting in northern Indiana. The practice was re-modeled three years ago to accommodate the growing population in this region and the surrounding county. This family practice serves primarily blue collared, middle-class citizens. Providers within this practice see patients of all ages, from newborns to older adults, and the population includes many family generations (Family Nurse Practitioner [FNP], personal communication, June 23, 2021). The ethnicity within the family practice is mainly Caucasian with some Hispanic population. There are

approximately 50 patients seen by the two providers within this office per day (FNP, personal communication, July 31, 2021). Approximately 15-20% of the patients seen per day are women age 65 years and older who are seen for their annual wellness examination or preventative care visit (Family Nurse Practitioner, personal communication, July 31, 2021).

Providers at this clinical site attested that obtaining a DXA scan in women age 65 years and older occurs less often than recommended by major organizations. The team, which includes a medical doctor (MD), family nurse practitioner (FNP), certified medical assistant (CMA) and registered nurse (RN), inconsistently obtain the necessary information to complete an osteoporosis risk assessment for women age 65 years and older; correspondingly, DXA scans are not ordered. The practice NextGen® electronic medical record (EMR) provides an alert to remind providers, but this tool is often overridden or ignored.

Purpose of the Evidence-Based Practice Project

Purpose Statement and PICOT Question

The purpose of this EBP project is to increase screening for osteoporosis amongst women age 65 years and older within the primary care setting. This project will answer the compelling clinical question: What evidence-based strategies are effective at increasing preventative care, including osteoporosis screening? Specifically, this project will address the following PICOT question: Among women age 65 years and older, what is the effect of mailed patient reminders on osteoporosis screening rates via DXA scan, as compared to previous screening rates over a 15-week time period?

EBP Project Description

This EBP project will be formally initiated on October 20, 2021, coinciding with World Osteoporosis Day (International Osteoporosis Foundation [IOF], 2021b). Immediately prior to World Osteoporosis Day, an educational event will be undertaken for key stakeholders within the clinical practice; osteoporosis statistics will be reviewed, and the benefits of screening within this population will be outlined. The intervention includes the utilization of mailed patient reminders to

increasing screening rates of osteoporosis of women age 65 and older during their annual wellness or regularly scheduled chronic medical visits with the provider. During these visits, all women who meet criteria should receive verbal education by the provider on the importance of getting a DXA scan; those accepting the screening will have an order for the DXA entered in the EMR. Outcome will include the percentage of qualifying patients who actually complete their osteoporosis screening (DXA completed).

CHAPTER 2

EBP MODEL AND REVIEW OF LITERATURE

Evidence-based Practice Model

Overview of EBP Model

Permission has been obtained to use the Johns Hopkins Evidence-Based Practice for Nurses and Healthcare Professionals (JHEBP) model for this project. The JHEBP has been noted to be straightforward and user-friendly, guiding individual or group use and enhancing team collaboration and care coordination (Johns Hopkins, 2020); these were important considerations for this EBP project. The newly revised JHEBP model has three major stages: (a) Practice Question and Project Planning (steps 1-7), (b) Evidence (steps 8-12), and (c) Translation (steps 13-20) (Dang et al., 2022). Clinical and academic feedback helped contribute to the Johns Hopkins EBP model. This model works closely with key stakeholders. The use of this problem-solving model implements action plans and determines the next path for front-line healthcare teams by distinguishing best practice ultimately for the patient.

Practice Question and Project Planning

The model's Practice Question and Project Planning stage consists of seven steps. The following seven steps must be met prior to progressing to the second stage; recruiting an interprofessional team (step 1), determining responsibility for the leader project (step 2), scheduling meetings for the team members (step 3), clarifying and describing the problem (step 4), developing the practice question and refining the EBP question (step 5), determining the need for the EBP project (step 6), and identifying key stakeholders (step 7).

Evidence

After completion of the Practice Question and Project Planning stage, the Evidence stage begins (step 8-12). Within the Evidence stage, the initial step (step 8) involves an internal and external search. In step 9, pieces of evidence are appraised for level and quality. Step 10

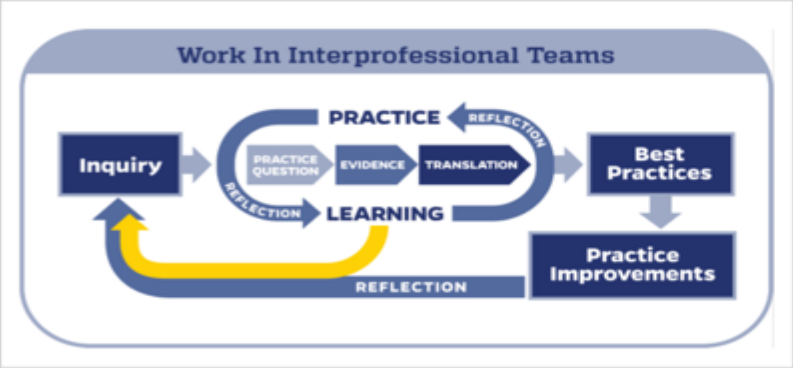
includes a summarization of the individual pieces of evidence collected. Within step 11, a complete synthesis of evidence is undertaken. This evidence synthesis is best completed through group discussion with critical thinking involving subjective and objective reasoning (Johns Hopkins Nursing, 2020). Step 12 is the development from the best evidence recommendations for change based on evidence synthesis (Johns Hopkins Nursing, 2020). After the team evaluates the evidence and feels the evidence can support the desired change, the translation stage can begin. If the evidence is not found to be supportive for the practice question, the team must go back to step eight and search for better evidence pieces.

Translation

After the Evidence stage is completed, the Translation stage can begin. Step 13 identifies practice setting recommendations. Examination of the feasibility and balance of the risk and benefit must be evaluated thoroughly to fit within the healthcare mission, goals, objectives and priorities (Upstate Medical University, 2020). In step 14, an action plan is developed. Step 15 involves securing support and resources to implement an action plan. Step 16 is the implementation of the action plan. Step 17 includes evaluation of the outcome and determination if improvements have been made. Step 18 is the reporting of results to key stakeholders. Step 19 identifies future steps, while step 20 includes a dissemination of findings to determine if this change can be systemwide or nationwide.

Figure 2.1

The Johns Hopkins Nursing Evidence Based Practice Model for Nurses and Professionals Model



Note: The Johns Hopkins Nursing Evidence-Based Practice Model was used with permission from the Johns Hopkins Hospital and Johns Hopkins University School of Nursing. (see Appendix A for permission statement).

Application of EBP Model to EBP DNP Project

Practice Question

Consistent with the first stage of the JHEBP model, a site for the EBP project was identified and an interprofessional team was recruited: the MD, FNP, RN, and MA. It was determined that the doctoral student would take on the leadership role for the EBP project. The doctoral student scheduled team meetings during which the clinical problem was clarified and further described. The FNP and MD, providing care within the clinic setting, reported that osteoporosis screening was not conducted as recommended by national guidelines; thus, their rates of preventative DXA screenings warranted improvement. An EBP question was initially developed and refined by the doctoral student to ensure that the EBP project would align with organizational priorities. Key stakeholders were identified. These included all members of the interprofessional team, as well as the health system's marketing team, and informational technology (IT) department. It was surmised that all key stakeholders provided valuable skills that would guide the success of this EBP project.

Evidence

Reflective of the second stage of the JHEBP model, an internal and external search for evidence was conducted. The search was narrowed to the use of mailed patient reminders based on fit and feasibility feedback from key stakeholders. Evidence was then leveled using Melnyk & Fineout Overholt' hierarchy of evidence due to the doctoral student's previous experience using the tool. Evidence from an EBP project report was appraised by the Melnyk & Fineout Overholt tool. Summarizing the evidence pieces individually was conducted in conjunction with the clinic FNP. Findings were then synthesized and the best evidence recommendation, which involved using patient reminders to increase preventative screenings (including DXA scans for osteoporosis) was developed.

Translation

Practice setting-specific recommendations were considered when determining the feasibility and fit of the evidence-based intervention. An action place was developed, in consultation with key stakeholders. Organization support for the intervention was obtained, especially from the healthcare system's marketing department. The intervention was scheduled to launch in October 2021, timed to coordinate with World Osteoporosis Day.

Literature Search

Sources Examined for Relevant Evidence

An exhaustive initial search of library databases, including Joanna Briggs Institute (JBI), Cochrane Library, CINAHL, MEDLINE with Full Text (via EBSCO), and PubMed, was conducted to identify effective interventions for improving osteoporosis screening rates. The initial literature search included a combination of keywords and included articles published in English within scholarly, peer-reviewed publications within the past 10 years. The literature search included a combination of keywords including "osteoporosis" OR "osteopenia" AND "screen" OR "improv*" OR DXA OR "dexa scan" OR "bone density" OR "interven". Following the initial search for best practice interventions, strategies were reviewed with key stakeholders, who ruled out

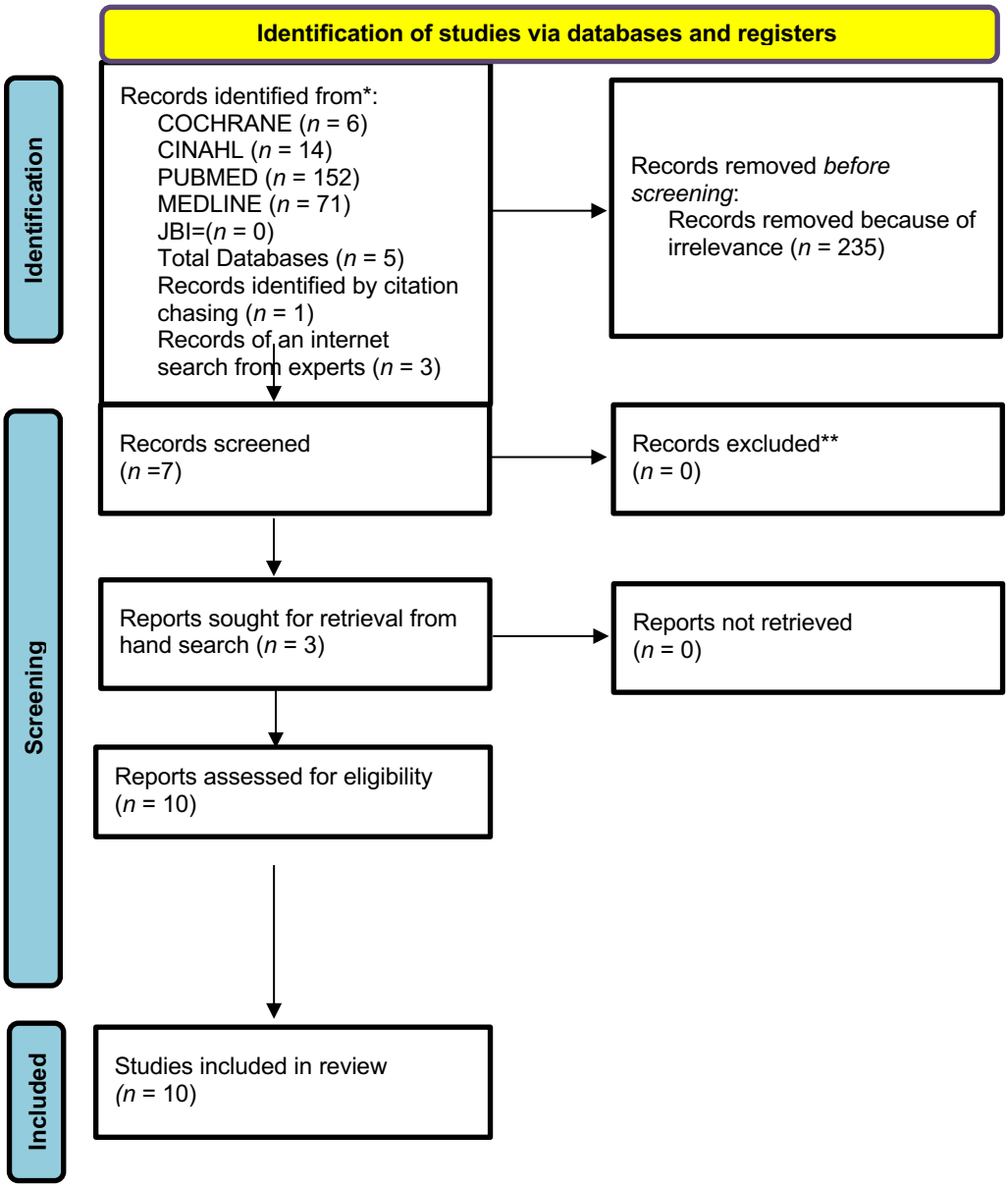
interventions that were impractical for the clinical setting (i.e., changes to the EMR system). A final search for evidence was conducted in databases JBI, Cochrane Library, CINAHL, PubMed, Medline with Full Text (via EBSCO). As the initial search returned a number of articles that focused on the benefit of patient reminders and key stakeholders determined that this approach aligned with their workflow, the keywords used for the final literature search were “patient remind*” and “mailed remind*”. Articles which focused on preventative health other than osteoporosis, were included in the supportive evidence when the patient population was the same as the identified population for this EBP project (women age 65 years and older). Articles were excluded from further evaluation if they did not include patient reminders as an integral part of the intervention and those participants who had a prior diagnosis of osteoporosis. Following the database searches, an extensive hand search of the project topic was conducted, using the same inclusion and exclusion criteria. Citation chasing was undertaken and this resulted in one piece of evidence.

The literature search yielded a total of 245 articles. Two hundred thirty five were deemed irrelevant based on the subject from the title. Assessment of the abstracts were reviewed and a total of ten articles remained. All articles were appraised by the CASP tool or the Melynk-Fineout Overholt tool and these articles support the EBP project intervention as preventative interventions. The two records from the internet search from experts were appraised by the Melnyk & Fineout-Overholt Appraisal tool.

The Prisma in Figure 2.2 depicts the literature search conducted.

Figure 2.2

EBP Project Prisma



Levels of Evidence

A total of 10 pieces of evidence will be used for this DNP project: one systematic review (SR), eight randomized controlled trials (RCTs), one cohort trial, one EBP project from a previous DNP student, and two expert opinions from websites. The Melnyk and Fineout-Overholt hierarchy of evidence tool (See Table 2.1) was used for rating the 10 pieces of evidence (Stillwell et al., 2010). There are seven different levels of evidence within this hierarchy. Level 1, the highest level of evidence, includes systematic reviews of randomized control trials (RCTs) and evidence-based clinical practice guidelines that are based on systematic reviews of randomized control trials. Level II includes evidence from at least one well-designed RCT, while Level III encompasses evidence from well-designed controlled trials without randomization. Level IV includes evidence from well-designed case control and cohort studies, while Level V encompasses evidence from systematic reviews of descriptive and qualitative studies. Level VI includes evidence from a single descriptive, or quality study, while Level VII, the lowest level of evidence, is comprised of the opinions of authorities and/or reports (Stillwell et al., 2010).

The analysis and appraisal for 10 pieces of evidence was conducted using the CASP tools and the Melnyk & Fineout-Overholt Rapid Critical Appraisal. Using the CASP tools, all SRs and RCTs were found to be of moderate or high quality. Using Melnyk & Fineout-Overholt Rapid Critical Appraisal, the EBP Project report and two expert opinions, which was determined to be of high quality. Table 2.3 below describes the summary of evidence pieces.

Table 2.3

Summary of Evidence

Author/Year	Database	Level of Evidence/Type	Quality/Tool
Jacobson et al., 2018	Cochrane Library	I/Systemic Review	High/CASP
Chan et al., 2018	CINAHL	II/RCT	High/CASP
Coronado et al., 2018	CINAHL	II/RCT	High/CASP
Hirko et al., 2020	CINAHL	II/RCT	Moderate/CASP
Levy et al., 2013	CINAHL	II/RCT	Moderate/CASP
Lipscomb et al., 2020	PUBMED	II/RCT	Moderate/CASP
Warriner et al., 2012	MEDLINE	II/RCT	High/CASP
Black, 2014	Web Search	VI/EBP Project expert	High/Melnyk & Fineout-Overholt
CDC, 2021	Web Search	VII/Expert Opinion	High/Melnyk & Fineout-Overholt
Health Partners, 2021	Web Search	VII/Expert Opinion	High/Melnyk & Fineout-Overholt

Analysis and Appraisal of Relevant Evidence

The quality of the pieces of evidence were appraised using the CASP tools and for appraising systematic reviews and randomized controlled trials. The 10 question CASP tool examines the trustworthiness and relevance of the selected pieces of evidence (Critical Appraisal, 2021). Ten questions will be answered by the evaluator as either: “yes”, “no”, or “can’t tell”. The Melynk & Fineout-Overholt rapid critical appraisal tools were used to evaluate the quality of the EBP project and the two expert opinions on the internet. Similar to the CASP, Melnyk & Fineout-Overholt rapid critical appraisal utilizes 22 questions that the evaluator can answer “yes”, “no”, or “unknown” (Stillwell et al., 2010).

Construction of Evidence-based practice

Synthesis of Critically Appraised Literature

A critical review of appraised literature revealed a number of themes related to best practice. Specifically, the literature was reviewed in light of frequency and/or timing of the reminders, length of time to outcome measurement, and method of outcome measurement. The CDC’s recommendation based on research with these foci, does not include these measures within the recommendation statement.

Patient reminders

Research authors of 8 pieces of evidence reported that mailed patient reminders, which included letters from the provider(s), increased preventative care screening (Black, 2014; CDC, 2021; Coronado et al., 2018, Health Partners, 2021; Jacobson et al., 2018; Levy et al., 2013; Lipscomb et al., 2020; & Warriner et al., 2012). Although a number of consistencies were noted within this portion of the body of evidence, a few differences were apparent: i.e., timing of the mailings, length of follow up, and statistical analyses used to determine outcomes.

Within some the pieces of literature, the authors described the period of time when mailed reminders were sent. Based on the target screening, the overall time frame for when the mailings were sent was scattered throughout a 12-month time period for both colorectal cancer screenings (Coronado et al., 2018) and breast cancer screenings (Lipscomb et al., 2020). In addition, the time frame for when the mailings were distributed through mailings for osteoporosis screening reminders and immunization reminders was over a 12-month time period (Jacobson et al., & Warriner et al., 2012). The reminder mailings were sent once during a 12-month time frame.

Follow up on the mailings varied from the pieces of evidence. Follow up on the mailed reminders were conducted at six months if the DXA was not scheduled (Warriner et al., 2012). At the 15-month time period follow up occurred when colorectal screening results were reviewed (Levy et al., 2013). At the 3- and 12-month time period following the mailed reminders, the mammogram screening rates were evaluated (Lipscomb et al., 2020). Within Black (2014) EBP project, the follow up on DXA screens was 12 weeks. Health Partners (2021) followed patients for a period of two years. Other researchers did not report the number of times that the mailed reminders were sent or needed to be sent (CDC, 2021; Coronado et al., 2018 & Jacobson et al., 2018). Coronado et al., included a stepwise mailing, with an introductory followed by the mailed test, and a reminder letter. There was not listing of the time period of the sequential mailings. Coronado followed patients to determine who completed the FIT within 12 months; so, there was a 12 month follow up period. Warriner only had one mailing, with the ability to self-schedule and this study had a follow up time period of 6 months. Chan et al (2018) had follow ups between six and 24 months. Levy et al (2013) had follow ups at the six-month mark. Health Partners (2021).

In reporting outcomes, data analyses from the supportive evidence most commonly included percentage change and less frequently reported risk reduction or odds ratio. Details of these outcome measures are outlined in the paragraphs below.

The effectiveness of mailed reminders for improving preventive care was also supported by researchers who used analyses other than percentage point increases. Coronado et al., found that their mailed reminder resulted in a 3.4-percentage point increase in screening rates (13.9% for the intervention group as compared to 10.4% for the control group; a 24.3% difference). Chan et al (2018) reported a greater than 10-percentage point difference in screening rate (34.4% for the intervention group as compared to 24% for the control group. Libscomb (2020) reported a 59.5% screening rate for breast cancer survivors. Hirko (2020) reports a 7.6% increase in screening rates of colorectal cancer. Levy (2013) noted an increase in screening rates with patient reminders by 38.7%. Health Partners (2021), a group of clinics in Minnesota, reported positive outcomes for the use of mailed reminders for a number of preventive care measures: a modest 0.7 percentage point increase for breast cancer screenings; a greater than 17-percentage point increase for immunizations. Black (2014) reports a 14-percentage point increase in the osteoporosis screening rates.

The effectiveness of mailed reminders for improving preventative care was also supported by researchers in four studies who used analyses other than percentage point increases. Chan et al., (2017) reported in increase (*RR* =1.41; 95% CI [1.30-1.54]). Evaluation of effectiveness of mailed reminders versus recall in those who were immunized revealed a *RR*=1.29, 95% CI [1.21-1.31] (Jacobson et al., 2018). Within the Levy et al (2013) study, preventive colorectal screening by mailed patient reminder was associated with an increased rate of screening (*OR* = 6.0) while adding a telephone call reminder to the mailed reminder resulted in only a modest increase in the odds ratio (*OR* = 6.2). Warriner et al. (2012) revealed a high probability that patient mailed reminders increased screening rates *OR* = 3.8; 95%CI [1.7-4.8].

Patient Reminder with Motivational Message

Within the literature evaluated for this EBP project, two groups of researchers included motivational messaging within the provider-signed reminder letter that noted that the preventative

care was overdue (Chan et al., 2018; Hirko et al., 2020). Within both of these studies, outcomes were measured by percentage point increases differences: the slightly greater than 10-percentage point increase within Chan et al., (2018) and 7.6 percentage point increase within Hirko et al., (2020). Of particular importance in the planning of this EBP project, is the finding (reflected in Appendix C) that the inclusion of motivational messaging did not improve preventive care rates.

Mailed Brochure and Self-Scheduling Instructions

The effect of including self-scheduling instructions with patient reminders (a mailed brochure) was examined within one study that was included in the evidence base for this EBP project (Warriner et al., 2012). Of note is that Warriner et al's (2012) research was specific to osteoporosis screening; and their DXA completion rates were more than 12-percentage points greater in those who received the self-scheduling instructions (17.3%) than the usual care group which is those who had standard reminder to self-schedule. These outcomes approximate those of researchers that did not include motivational messaging with their patient reminder.

Mailed Patient Reminder and Provider Chart Reminder

Within one study that was included in the evidence base for this project, the researchers implemented a combination of mailed patient reminders plus a form that encouraged the provider to note the patient's elevated risk status within the medical record and note the engagement of appropriate screening (Lipcomb et al., 2020). This flagging system did remind the provider of the risk based on history in two groups: high and low intensity groups with a 60% of first degree relatives increase in preventative mammograms and 72% increase in breast cancer survivors as compared to the low intensity (brochure only) group (Lipscomb et al., 2020). Follow up of this study was 12 months.

Recommendations from Major Healthcare Organizations

National organizations (i.e., CDC, 2021; Health Partners, 2021) support and/or recommend the use of patient reminders to enhance preventive care. These broad-based

recommendations typically do not include suggestions on how to measure changes in outcomes, how frequently to issue the reminders, or how long after intervening to measure the change in outcomes. Nonetheless, their recommendations, which are grounded in research, provide support for the use of mailed patient reminders.

Recommendation for Best Practice

Based on the synthesis of evidence, and an evaluation of the feasibility of these interventions at the designated project site, it was determined that the most appropriate intervention is a mailed patient reminder, delivered once with a signature from the provider with motivational messaging. The patient mailed reminders of the recommended screening test of a DXA screen will be sent once on October 20, 2021 with the recommendation of getting this screening test. Follow up measurement will weekly to measure if the participant obtains this screening tool.

CHAPTER 3

IMPLEMENTATION OF PRACTICE CHANGE

Women age 65 years and older are known to be at risk for osteoporosis. Undetected osteoporosis is a silent disease. Early screening can detect this disease and prevent fragility fractures. This DNP project aimed to increase rates of osteoporosis screening in a primary care setting through the use of mailed patient reminders.

Participants and Setting

This EBP project was taken place in a family practice setting in a small city in northern Indiana. Within this practice, patients are cared for by an FNP and MD. The FNP is female and has been in practice for over 4 years. The MD is male, and he has been in practice for over 24 years. The participants in this EBP project, patients of the FNP and MD, consist of women age 65 who do not have a record of previous DXA scan within their EMR. Participants who have previously been screened or have a diagnosis of osteoporosis or osteopenia via other testing will be excluded. These participants who have a diagnosis of osteoporosis or osteopenia diagnosed by DXA or other testing will be excluded. The time frame for collecting data from the participants will be from October 20, 2021-February 2, 2022.

Pre-Intervention Group Characteristics

The practice initially identified 212 women who were age 65 and older. Of these, 14 women who were excluded from this EBP project because they were no longer active in the practice or were in hospice care. Of these 198 active older adult women, 77 active patients (38.9%) did not have record of a DXA within the EMR. Of those 77 patients, nearly three-fourths (74% were patients of the physician (n = 57) and the remaining 20 patients were identified as patients of the FNP (26%). Of the 77 women without a record of a DXA scan within their EMR, 97.4% were non-smokers (75 participants) and 2.6% were smokers (2 participants); 83.1% had

Medicare (64 participants), 14.3% were private insurances holders (11 participants), and 2.6% were Medicaid (2 participants). The age group category of 65-74 included 44 females (57.1%). The age group category of 75-84 included 23 females (30%). The age group category of 85 years and older were 10 females (12.9%).

Of the women who have had a DXA screens per documentation on their EMR (n = 121); 17 were patients from the NP (14%) and 104 were patients of the MD (86%).

Intervention

During the planning phase of the project, key stakeholders provided significant insight and guidance into the development of the intervention. The DNP student worked with the marketing department within the health system to develop the mailed patient reminder. Based on their knowledge of the patient population, key stakeholders determined that the appropriate reading level for them would be that of a 12-year-old. The physician and NP were provided drafts of the proposed letter at least three times, and revisions were made based on their feedback; the final edits of the mailed reminder were approved by both the physician and the NP and sent to marketing for printing.

The physician and NP were also integral in determining a launch day for the intervention. The DNP student recommended initiating the intervention within the month of October, on a day that correlated with World Osteoporosis Day. All key stakeholders were in agreement that the October launch date was feasible for the practice. The final determination was that the intervention would launch on October 14, 2021. On that date, the marketing department sent out the mailed patient reminder to all women age 65 and older within the practice who had been identified, through EMR review, as not having a DXA scan within their medical record. The reminder letter (see Appendix F) addressed the benefits of screening for osteoporosis via DXA scan and provided the office phone number for those wanting to schedule the DXA scan or electing to discuss further with the provider at an office visit.

To prepare for the launch of the intervention, a meeting was scheduled via zoom on Tuesday, October 5, 2021 for the NP, MD and all support staff were provided of education that included a review of a PowerPoint (see Appendix G) which included statistics addressing the benefit of DXA screening. Front office staff who answer the telephones were given a clipboard of the patients who were mailed the patient reminder in case the patient called in asking about this reminder letter.

Beginning on October 14th, the following changes would be implemented within the practice. All patients receiving the mailed reminder would contact the office via telephone to (a) request that the DXA would be scheduled or (b) schedule an appointment with the provider to further discuss the need for screening. For those who elected to proceed with screening, the front office staff will send a "task" via the EMR to the RN, notifying her of the patient's request to schedule the DXA scan. The front office would also add a check mark to the patient's name where this was not visible to other patients. The clipboard was used to tract the patients who called in to schedule their DXA after receiving the mailed reminder. was mailed out on October 14, 2021 at 0700 at this practice setting by verbal education. Ultimately, the task within the patient's EMR will track whether the patient called in to inquire about this reminder letter or the EMR will reveal if this was discussed at the patient's office visit. For the patient electing to schedule an appointment to discuss further with the provider, the physician or NP will educate the patient the benefits and limited risks of screening. Then, the providers will answer any questions and, if the patient is willing, enter the DXA order into the EMR system.

Every week this DNP student hand searched the 77 patients to see if they called in and a telephone encounter was formed. If the patient was seen at an office visit, the encounter will be reviewed by this student and an ongoing excel spreadsheet will be reviewed on the patients sent the reminder.

Comparison

The population of women age 65 years and older will be comparison group from the literature evidence pieces. The literature pieces was tested against the median value of a result from the literature, 11.65% (3.5%, 7.6%, 10.4%, 11.2%, 12.1%, 14.0%, 38.7% and 59.5%) (Black, 2014; Chan et al., 2018; Coronado et al., 2018; Hirko et al., 2020; Jacobson et al., 2018, Levy et al., 2013; Lipscomb et al., 2020; Warriner et al., 2012).

Outcomes

The primary outcome of this study was the change in percentage of women age 65 years and older who had undergone a DXA screening. This was consistent with the supportive evidence with review of the literature from Chan et al., 2018, Coronado et al., 2018; Hirko et al., 2020, Levy et al., 2013; Warriner et at., 2012. A secondary outcome was the percentage of those screened who are diagnosed with osteopenia or osteoporosis, as the providers within the practice requested this data; reports of this outcome will be provided in descriptive format only.

Time

The timeline for implementation of this project is outlined in table 3.1.

Table 3.1: *PET Process Guide*

Initial EBP question: Among women age 65 years and older, what is the effect of mailed patient reminders on osteoporosis screening rates via DXA scan, as compared to previous screening rates over a 15-week time period?										
EBP team leader(s): Kacy Davis, FNP										
EBP team members: Dr. Julie Koch, Dr. Berger, Mackenzie Shireman, DNP, MA, RN										
Goal completion date: April 2022										
Steps		Month								
		1	2	3	4	5	6	7	8	9
Practice Question & Project Planning	1. Recruit interprofessional team	5/21								
	2. Determine responsibility for project leadership	5/21								
	3. Schedule team meetings	5/21								

	4. Clarify & describe the problem (App. B)		6/21							
	5. Develop & refine the EBP question (App. B)	5/21	6/21							
	6. Determine the need for an EBP project	5/21								
	7. Identify stakeholders (App. C)	5/21								
Evidence	8. Conduct internal & external search for evidence	5/21	6/21							
	9. Appraise the level & quality of each piece of evidence (Apps. E/F)		6/21							
	10. Summarize the individual evidence (App. G)		6/21							
	11. Synthesize findings (App. H)			7/21						
	12. Develop best evidence recommendations (App. H)			7/21						
Translation	13. Identify practice setting–specific recommendations (App. I)			7/21						
	14. Create action plan (App. I)	8/21			8/21					
	15. Secure support & resources to implement action plan	8/21				9/21				
	16. Implement action plan						10/21	11/21	12/21	1/22
	17. If change is implemented, evaluate outcomes to determine if improvements have been made									
	18. Report results to stakeholders (App. C)	2/22						1/22		
	19. Identify next steps	3/22							2/22	

	20. Disseminate findings (App. J)	4/22								3/22

Implementation of this EBP project began on Wednesday, October 20, 2021, correlating with World Osteoporosis Day. The Johns Hopkins Nursing Evidence-Based Practice Model uses evidence to translate into best practice within practice improvements such as this implementation of this intervention.

Protection of Human Subjects

This DNP student completed CITI training (see Appendix D) on March 23, 2021. This EBP project was given approval by the clinical site office health system's IRB board on July 30, 2021; following the DNP student's review and acknowledgement of compliance with the system's HIPAA policy. The IRB board at Valparaiso University determined that this EBP project did not meet the Federal definition of research on August 3, 2021; no further oversight would be provided. As the intervention for this project was an evidence-based change in practice, informed consent was not needed from patients within the practice, but the physician and NP provided their support for the practice change verbally. Chart audits were conducted on site in an office within the practice that was only available to this student during the time of the audits and data were de-identified prior to analyses. Outcome data will be reported in only in aggregate form; no identifiable information regarding any patient will be released or disclosed.

CHAPTER 4

FINDINGS

The purpose of this EBP project was to increase DXA screening rates in women at their local primary care facility. The primary outcome of increased screening rates was measured by the females getting the DXA screen within this 15-week time period.

Participants

The pre-intervention group consisted of 77 female participants who had not had a DXA screen. After further review of this group, two women were in hospice and three were deceased leaving a final analyzable cohort of 72 women. Out of these 72 women, 81% were patients of the physicians (*n*=58) and the remaining 14 patients were identified as patients of the FNP (19%). Of the 72 women who were mailed patient reminders, 71 were non-smokers (99%) and 1 was a smoker (1%); 97% had Medicare (*n*=70), 0% were private insurance holders, and 3% Medicaid insurance (*n*=2). Sixty-three percent (*n*=45) of females were age 65-74. Twenty-three females (32%) were age 75-84. The remaining 6% (*n*=4) of patients were age 85 and older.

Mailed reminder letters were sent to all 72 women. As a result, six women (8.3%; 95% CI: 3.12%- 17.30%) got the DXA screen during the 15-week time period. Of those six women who were mailed reminders and who underwent the DXA screen, 83.3 % were non-smokers (*n*=5) and 16.7% were smokers (*n*=1); and all had Medicare insurance. There were not any self-paying or Medicaid participants. Two-thirds (67%, *n*=4) were age 65-74 and one-third of the patients (*n*=2) were age 75-84. There were no patients 85 or older. (See Table 4.1)

Table 4.1

Demographic Characteristics for those who had DXA screen

Smoking history	
Non-smokers	83.3% (5 participants)
Smokers	16.7% (1 participant)
Insurance	
Medicare	100% (6 participants)
Self-pay	0% (0 participants)
Medicaid	0% (0 participants)
Age	
65-74	66.7% (4 participants)
75-84	33.3% (2 participants)
85+	0% (0 participants)

The result of 8.3% was tested against the median value of a result from the literature, 11.65% (3.5%, 7.6%, 10.4%, 11.2%, 12.1%, 14.0%, 38.7% and 59.5%) (Black, 2014; Chan et al., 2018; Coronado et al., 2018; Hirko et al., 2020; Jacobson et al., 2018, Levy et al., 2013; Lipscomb et al., 2020; Warriner et al., 2012). The proportion of women who were screened because of this reminder letter was no different than results from the literature (binomial test, p=.465). This result is not statistically significant. The results from this binomial test indicate that they were not clinically, significantly different from the literature and this is optimistic for this intervention.

Secondary outcomes from the reminder letter identified three women with osteopenia (50%), two women with osteoporosis (33.3%) and one woman had a normal DXA scan (16.7%). With these six female participants who participated with this intervention, this represented the female population within this practice setting who obtained the DXA screen. Both providers at this office encouraged DXA screening.

Changes in Outcomes

This EBP project addressed the following PICOT question: Among women age 65 years and older, what is the effect of mailed patient reminders on osteoporosis screening rates via DXA scan, as compared to previous screening rates from mailed reminder letters evidence of literature over a 15-week time period? The primary outcome measured for this project was participant completion of DXA screen.

Statistical Testing and Significance

For data entry, SPSS was utilized. For statistical analysis, this student had a well-known statistician, Gregory Gilbert who analyzed this data. A one-sample binomial test was used for this data analysis to determine if the observed results differed from results from the literature. Reliable testing from a collection of disparate environments can often be an occurring problem (Myhre et al., 2018). Comparing estimation results from two different proportions gives clear results via the binomial test for statistical analysis.

Findings

Primary Outcome

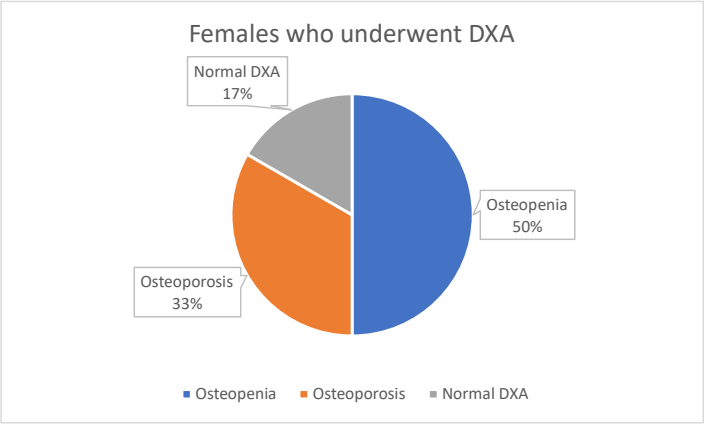
There was an 8.3% success rate of the DXA screening as a result from the patient mailed reminder letter to those 72 women who received this in the mail. There was a total of six participants who underwent the DXA screen. The 95% confidence interval of the specified probability was 3.12% and 17.30%. The median value of the results from the evidence of literature was 11.65% therefore the proportion of those who did get the DXA screen because of this reminder letter was no different than results from the literature (binomial test, p=.465).

Secondary Outcome

There were three female participants who had a result of osteopenia from the DXA scan (50%). There were two female participants who had a result of osteoporosis from the DXA scan (33%). There was one female participant who had a normal DXA scan (17%). (See Figure 5.1)

Figure 4.1

Secondary data



CHAPTER 5

DISCUSSION

The EBP project served the purpose of addressing the effect of patient mailed reminder letters on osteoporosis screening rates via DXA scan on previous screening rates in those who have not had a DXA screen. Upon learning that 72 women patients did not undergo a DXA screen at a small PCP office in northern Indiana, this EBP identified six who did undergo the DXA as a direct result of the patient mailed reminder letter. National clinical guidelines recommend women age 65 and older to receive a DXA to identify if they are at risk for osteoporosis. The interprofessional team of two providers, one nurse, and this DNP student was formed. An extensive review of literature was performed in detail. As a direct result of a synthesis of literature, best practice was identified. Screening based on patient mailed reminders were identified in the literature and patient mailed reminder letters were the best practice. This EBP project goal was to increase osteoporosis screening rates in the primary care setting.

Explanation of Findings

Prior to the implementation process of this EBP project, this student worked closely with the IT department for the practice site to identify those women age 65 and older who had not had a DXA screen within the EMR system. The data collected revealed 77 women who had not had a DXA screen from a total of 212 females age 65 and older in this local primary care practice. After further analysis, the total women who did not undergo a DXA were further reviewed and two of the women were in hospice and three passed away during the 15-week data collection period. The final total of the women who did not undergo a DXA screen was narrowed down to 72 women. The PICOT question for this EBP project concentrated on women ages 65 and older and the effect of patient mailed reminders on osteoporosis screening rates via DXA scan as compared to previous screening rates over a 15-week time period. The findings following the implementation of this EBP project are discussed below.

The primary outcome for this EBP was designed to measure the total number of women who had a DXA screen as a direct result from the mailed patient reminder letter. A total of six women completed the DXA screen out of 72 female participants. The percentage of participants who completed the DXA screen was 8.3%. The percentage rate of those who did have the DXA was tested against the median value of the pieces of literature who underwent a screening as a result of a mailed reminder letter. The eight pieces of evidence were analyzed, and the median value of the literature was 11.65% who underwent screening as a result of a patient mailed reminder letter. Data analysis with this student's statistician used the binomial test to compare if this was statistically significant. The six women who underwent the DXA screen within the 15-week time period within the total cohort of 72 women because of the reminder letter was no different than the results from the literature (binomial test, p=.465). Statistically, the result was not significant. Clinically, the results were not clinically significantly different from the literature therefore this implementation of the mailed reminder letter is hopeful for future screening interventions. Phone calls were made weekly to those female participants inquiring if they would undergo DXA screening and, if they did complete this screen, the final result of the DXA.

Secondary outcomes were identified results from the DXA scan when the female participants completed the DXA screen. A total of three women were diagnosed with osteopenia, two women were diagnosed with osteoporosis, and one had a normal DXA scan. Results from the DXA screen were reviewed with their provider via the telephone, telehealth, or in the office.

Strengths and Limitations of the DNP Project

The Johns Hopkins Evidence-based Practice for Nurses and Healthcare Professionals model was used for this EBP project. This model guided this student in a straightforward and user-friendly manner for the success of this project. The practice question and project planning (steps 1-7) aided in the organization of this EBP project. The mailed reminder letter served as an effective intervention from the evidence collected from literature (steps 8-12). Steps 13-20 served

to translate findings and to disseminate accordingly. Key stakeholders were closely intertwined within the production of this EBP project.

Strengths

Several strengths were evident within this EBP. A thorough review of literature was conducted and countless databases were searched. All searches were improved with an excellent librarian who helped this student tremendously at Valparaiso University. Several databases were reviewed to help reveal excellent pieces of evidence. With the help of this student's advisor, 10 pieces of evidence were finalized from the literature search.

Support staff from the IT department from the health system where this EBP project took place were extremely helpful. Data was plucked several times and all IT personal were accommodating when inquiring about project data. Support staff from the marketing department from this health system were beneficial when designing the reminder letter for the participants. A marketing specialist helped this student design the reminder letter and graciously accepted responsibility of mailing the reminder letters for the 72 females. This was a benefit from this student being employed by this health system and implementation of the EBP project within this system.

This EBP project was successful due to the key stakeholders' present while this project took place. Without this student's advisor and clinical advisor, this project would not have been as successful. This student's clinical advisor showed this student where to find any previous screening questions within the EMR system and where they may be scanned within the patient's chart. This student's clinical advisor had been there every step of the way when any questions did arise during this process. This student's academia advisor the first semester (Dr Julie Koch) was helpful when deciding what was the best pieces of evidence from the literature and critiquing my EBP project. Without the support from Dr. Koch and the constant encouragement through text message and phone calls, this EBP project would not be as successful. This student's academia advisor the second semester (Dr. Mackenzie Shireman) was extremely encouraging

when helping this student prepare for the final stretch of this EBP project. All the concerns and many questions this student had were discussed instantly via text messaging or phone call. Dr. Shireman has been inspiring!

Calling the female participants who did not have any documentation on their EMR after mailing the mailed reminder allowed this student to discuss the reminder letter and many of the females enjoyed the personalized letter. The cohort of female individuals who answered the phone were appreciative of the phone call and expressed reasoning if they did not choose to undergo the DXA screening.

Limitations

Despite the strengths of this EBP project, several limitations were encountered. The most significant limitation of this EBP project was that the female participants declined to undergo the DXA screen. Several phone calls did reveal the failure of getting a DXA screen in the past despite having their PCP encourage them at several previous medical appointments. Several females within this cohort did not answer their phone calls when this student called to inquire. Voicemail was not left on their messaging system due to the influx of phone calls this office may get as a direct result and this was limiting.

This EBP project took place during the fall of the second year of the COVID-19 pandemic. Several restrictions were still in place from the pandemic and this implementation process occurred during the late fall and winter months. With Indiana weather, this could have been a factor to the limited amount of DXA screens performed during this 15-week time period.

Staffing at the imaging center that this office refers all DXA screens was limited. This could have factored into the low levels of rates that did participant in the DXA screening. The average wait time for scheduling for a DXA screen is 2-3 weeks after the referral is placed within this health system.

Sustainability

Actions taken to sustain the project at this clinical site were to continue encouragement of the DXA screening to those women age 65 and older who did not already obtain a DXA. The clinical site has a limited staffing situation at this office setting and is considering adopting the patient mailed reminder letter. The EMR system is going to be changing within the next year into a more universal documentation system that correlates with the hospital EMR system. The medical doctor would like to continue this patient mailed reminder for many various screening tools that the patient needs but time is of the essence and this is limited to staffing. If this student had the opportunity to redo this project, recommendation would be to have a larger collection time of up to a year and to incorporate the spring and summer months since females might be more apt to going out on warmer days.

Relevance for EBP Model

The Johns Hopkins Evidence-based Practice for Nurses and Healthcare Professionals model to guide this EBP project was extremely useful to this student. The first step when using this model was identifying the question that can be answered with research from evidence. Evidence was gathered from many comprehensive literature searches within the Valparaiso University databases on the library website. This student's clinical question was focused using the PICO formula. This model is organized so that the best clinical problem can be focused into the best answerable question. The second step was to gather the best evidence to answer the PICO question. This student had many keywords and phrases at the beginning when trying to figure out the best pieces of evidence within the databases. Least helpful searching tips were that one can do a hand search, and this was recommended towards the end of one of our educational sessions with the advisor. Lastly, the third step was translating evidence into practice. This student would recommend placing a mini step between steps two and three. The mini step would organize all the evidence pieces and thoroughly analyze the pieces before translating into the practice setting. This mini step is missed but this step is a huge time commitment when reading all the evidence on the clinical questions. Overall, this student feels

this EBP model is straightforward, yet concise. The final third step brings together all the evidence into the practice setting.

Recommendations for the Future

Research

The results of this EBP project were affected by the time period this project was taking place -the midst of a pandemic. Further research is necessary to study the effects of patient mailed reminders from web-based interventions or physical based interventions, such as a pamphlet on improving rates of DXA screenings. Various interventions can be researched and be evaluated for usefulness in clinical practice. Several pieces of evidence discussed option of FRAX risk score and how this can be intertwined within the EMR system. This was not feasible for this EBP project, but further research could focus on the use of the FRAX scoring system within future EMR systems.

Education

Commitment to lifelong learning stems from the APRN's desire to be informed about best practices and the interventions or resources available for use. Education is necessary to inform female participants why completion of a DXA screen is important. Continued education about the effects of not performing this screening for osteoporosis should be examined at a greater depth. While it makes sense to screen women age 65 and older for osteoporosis, the risk of not having this screening performed can have devastating effects for their future.

Conclusion

The incidence rate of women who will develop osteoporosis in their lifetime is 1 in 2 women and this is only expected to increase (NOF, 2021b). It is important that primary care providers, including APRNs, continue to screen patients according to the national clinical guidelines. The USPSTF recommends all women age 65 years and older undergo a DXA test to screen for osteoporosis (USPSTF, 2018). This recommendation is a grade B recommendation and this screening tool is accurate for detecting osteoporosis and for forecasting fracture risk.

This EBP project sought to answer the following PICOT question: Among women age 65 years and older, what is the effect of mailed patient reminders on osteoporosis screening rates via DXA scan, as compared to previous screening rates from mailed reminder letters evidence of literature over a 15-week time period? There was a nonsignificant increase in osteoporosis and osteopenia screening uptake over the 15-week time period. The proportion of women who were screened because of this reminder letter was no different than results from the literature (binomial test, p=.465). This result from this EBP project was not statistically significant, but the results from this binomial test indicate that they were not clinically, significantly different from the literature. A larger sample size and a longer time frame without presence of a pandemic would explore significance of this mailed reminder letter intervention.

REFERENCES

American Bone Health. (2020). *Understanding bone density results.* https://americanbonehealth.org/bone-density/understanding-the-bone-density-t-score-and-z-score/

Black, B. (2014). *The effect of patient reminders of osteoporosis screenings.* ValpoScholar from Valparaiso University. http://scholar.valpo.edu/ebpr

CASP. (2021). CASP checklist. https://casp-uk.net/casp-tools-checklists/

CDC. (2021). Clint (patient) reminder planning guide. https://www.cdc.gov/screenoutcancer/ebi-planning-guides/client-reminder-planning-guide.htm

Chan, E. K., Wilson, C., Tyldesley, S., Olivotto, I. A., Lai, A., Sam, J., Harry, R., & Nichol, A. (2018). Signed family physician reminder letters to women overdue for screening mammography: A randomized clinical trial. *Journal of Medical Screening, 25*(3), 149-154. DOI:10.1177/0969141317719921

Chen, X., Wang, Z., Duan, N., Zhu, G., Schwarz, E. M., & Xie, C. (2018). Osteoblast-osteoclast interactions. *Connective Tissue Research, 59*(2), 99-107. https://doi:10.1080/03008207.2017.1290085

Coronado, G. D., Petrik A. F., Vollmer, W. M., Taplin, S. H., Keast, E.M., Fields, S., & Green, B. B. (2018). Effectiveness of a mailed colorectal cancer screening outreach program in community health clinics The STOP CRC cluster randomized clinical trial. *Journal of American Medical Association Internal Medicine, 178*(9): 1174-1181. Doi:10.1001/jamaintermed.2018.3629

Critical Appraisal Skills Programme. (2021). *CASP*. https://casp-uk.net/casp-tools-checklists/

Dang, D., Dearholt, S., Bissett, K., Ascenzi, J., & Whalen, M. (2022). *Johns Hopkins evidence-based practice for nurses and healthcare professionals: Model and guidelines*. (4th ed.). Sigma Theta Tau International. https://www.hopkinsmedicine.org/evidence-based-practice/ijhn_2017_ebp.html

Dempster, D. W. (2011). Osteoporosis and the burden of osteoporosis-related fractures. *The American Journal of Managed Care, 17*(6), S164-S169. https://www.ajmc.com/view/a357_11ma7__dempster_s164to169

Health Partners. (2021). *Preventive care reminders.* https://www.healthpartners.com/hp/about/understanding-cost-and-quality/quality-improvement/preventive-care-reminders/index.html

Hirko, K. A., Lennon, S. A., Lucas, T., Miller, D. C., Jimbo, M., Leibfritz, S. J., Knoff, S. J., Janney, C. A., & Berg, P. D. (2020). Improving colorectal cancer screening in a rural setting: a randomized study. *American Journal of preventive medicine, 59*(3): 404-411.

Humadi, A., Alhadithi, R. H., & Alkudiari, S. I. (2010). Validity of the DEXA diagnosis of involutional osteoporosis in patients with femoral neck fractures. *Indian Journal of Orthopedics, 44*(1), 73-78. https://doi:10.4103/0019-5413.58609

International Osteoporosis Foundation. (2021a). Key statistics for northern America. https://www.osteoporosis.foundation/facts-statistics/key-statistics-for-north-america

International Osteoporosis Foundation. (2021b). *World Osteoporosis Day.* http://www.worldosteoporosisday.org

Jacobson, J. C., Jacobson, R. M., Coyne-Beasley, T., Asafu-Adjei, J. K., & Szilagyi, P. G. (2018). *Patient reminder and recall interventions to improve immunization rates (review).* Cochrane Database of Systematic Reviews. doi:10.1002/14651858.CD003941.pub3.

Johns Hopkins Medicine. (2021). Bone densitometry. https://www.hopkinsmedicine.org/health/treatment-tests-and-therapies/bone-densitometry

Levy, B. T., Xu, Y., Daly, J. M., & Ely, J. W. (2013). A randomized controlled trial to improve colon cancer screening in rural family medicine: an Iowa research network (IRENE) study. Journal of American Board of Family Medicine, 26(5): 486-497.

Lewiecki, E. M. (2021). *Overview of dual-energy x-ray absorptiometry.* UpToDate. Retrieved on July 6, 2021 from https://www.uptodate.com/contents/overview-of-dual-energy-x-ray-absorptiometry?search=osteoporosis%20&topicRef=2046&source=see_link#H1

Libscomb, J., Escoffery, C., Gillespie, T. W., Henley, S. J., Smith, R. A., Chociemski, T., Almon, L., Jiang, R., Sheng, X., Goodman, M., & Ward, K. C. (2020). Improving screening uptake among breast cancer surviviors and their first-degree relatives at elevated risk to breast cancer: results and implications of a randomized study in the state of Georgie. *International Journal of Environmental Research and Public Health. 17*, 1-19.

Myhre, J., Jeske, D. R., Li., J., & Hansen, A. M. (2018). Combining binomial test data via two-stage solutions*. Applied Stochastic Models in Business & Industry, 34*(1), 20-30. DOI:10.1002/asmb.2255

National Osteoporosis Foundation. (2021a). *Osteoporosis fast facts.* https://cdn.nof.org/wp-content/uploads/2015/12/Osteoporosis-Fast-Facts.pdf

National Osteoporosis Foundation. (2021b). *What is osteoporosis and what causes it?* https://www.nof.org/patients/what-is-osteoporosis/

Rosen, H. N., & Drezner, M. K. (2021). Clinical manifestations, diagnosis, and evaluation of osteoporosis in postmenopausal women. *UpToDate.* Retrieved from July 7m 2021 from https://www.uptodate.com/contents/clinical-manifestations-diagnosis-and-evaluation-of-osteoporosis-in-postmenopausal-women?search=osteoporosis&source=search_result&selectedTitle=3~150&usage_type=default&display_rank=2

Stillwell, S. B., Fineout-Overholt, E., Melnyk, B. M., & Williamson, K. M. (2010). Evidence-based practice, step by step: Searching for the evidence. *American Journal of Nursing, 110*(5):41-47. https://doi:10.1097/01.NAJ.0000372071.24134.7e

Upstate Medical University Health Sciences Library. (2020). Johns Hopkins Nursing Evidence-Based Practice. https://guides.upstate.edu/c.php?g=1023176&p=7411256

US Preventative Services Task Force Recommendation Statement. (2018a). *Journal of the American Medical Association, 319*(24): 2521-2531. doi:10.1001/jama.2018.7498

US Preventative Services Task Force. (2018b). Screening to prevent osteoporotic fractures updated evidence report and systematic review for the US Preventative Services Task Force. *Journal of the American Medical Association*, *319(*24): 2532-2551. Doi:10.1001/jama.2018.6537

Warriner, A. H., Outman, R. C., Kitchin, E., Chen, L., Morgan, S., Saag, K. G., & Curtis, J. R. (2012). A randomized trial of a mailed intervention and self-scheduling to improve osteoporosis screening in postmenopausal women. *American Society for Bone and Mineral Research, 27*(12): 2603-2610. DOI:10.1002/jbmr.1720

Williams, S. A., Chastek, B., Sundquist, K., Barrera-Sierra, S., Leader, D., Weiss, R. J., Wang, Y., & Curtis, J. R. (2020). Economic burden of osteoporotic fractures in US managed care enrollees. *The American Journal of Managed Care, 26*(5). https://www.ajmc.com/view/economic-burden-of-osteoporotic-fractures-in-us-managed-care-enrollees

World Health Organization. (2007). *WHO scientific group on the assessment of osteoporosis at primary health care level. Summary meeting report.* https://www.who.int/chp/topics/Osteoporosis.pdf

BIOGRAPHICAL MATERIAL

Kristine E. Davis

Mrs. Davis earned her Bachelor of Science in Health Sciences from Purdue University in 2004. In 2007, she continued her education at Goshen College and received her Bachelor of Science in Nursing (BSN). After achieving her Registered Nurse (RN) licensure, she worked at Goshen Hospital in the progressive care setting in Goshen, Indiana. Mrs. Davis's love for learning guided her to receive a Master of Science in Primary Care Nursing at Indiana Wesleyan University in 2015. She was later awarded her Family Nurse Practitioner (FNP) certification through the American Nurses Credentialing Center (ANCC) and the American Association of Nurse Practitioners (AANP) summer of 2015. Mrs. Davis is an active member of the Sigma Theta Tau International Honor Society of Nursing, Eta Chi Chapter. She is also a member of the Coalition of Advanced Practice Nurses of Indiana (CAPNI) chapter 5 region. She serves on the Organizational and Medical Ethics Committee (OMEC) at Goshen Hospital. Mrs. Davis is a recipient of the 2020 MACademy award at Goshen Hospital for commitment to high quality. In May 2022, she will graduate with her Doctorate of Nursing Practice (DNP) degree from Valparaiso University with aspirations of growing her practice at Goshen Orthopedics while contributing to the advancement of APRN political advocacy.

ACRONYM LIST

AANP: American Association of Nurse Practitioners

ANCC: American Nurses Credentialing Center

APRN: Advanced Practice Registered Nurse

BMD: Bone Mineral Density

BSN: Bachelor Science in Nursing

CAPNI: Coalition of Advanced Practice Nurses of Indiana

CASP: Critical Appraisal Skills Programme

CMA: Certified Medical Assistant

DXA: Dual-Energy X-ray Absorptiometry

EBP: Evidence-Based Project

EMR: Electronic Medical Record

FNP: Family Nurse Practitioner

FRAX: Fracture Risk Assessment Tool

IOF: International Osteoporosis Foundation

ISCD: International Society for Clinical Densitometry

JHEBP: Johns Hopkins Evidence-Based Practice for Nurses and Healthcare Professionals

NOF: National Osteoporosis Foundation

OMEC: Organizational and Medical Ethics Committee

OST: Osteoporosis Self-Assessment Tool

ORAI: Osteoporosis Risk Assessment Instrument

OSTA: Osteoporosis Self-Assessment Tool for Asians

RN: Registered Nurse

SCORE: Simple Calculated Osteoporosis Risk Estimation Instrument

US: United States

USPSTF: United States Preventive Services Task Force

WHO: World Health Organization

WOD: World Osteoporosis Day

APPENDIX A

The Johns Hopkins Nursing Evidence-Based Practice Model Permission

JOHNS HOPKINS EBP MODEL AND TOOLS- PERMISSION

Johns Hopkins Nursing
Center for Evidence-Based Practice

Thank you for your submission. We are happy to give you permission to use the Johns Hopkins Evidence-Based Practice model and tools in adherence of our legal terms noted below:

- You may not modify the model or the tools without written approval from Johns Hopkins.
- All reference to source forms should include "©The Johns Hopkins Hospital/The Johns Hopkins University."
- The tools may not be used for commercial purposes without special permission.

If interested in commercial use or discussing changes to the tool, please email ijhn@jhmi.edu.

Downloads:

JHEBP Tools-Printable Version

JHEBP Tools-Electronic Version

2022 JHEBP Tools- Printable Version

2022 JHEBP Tools- Electronic Version

Do you prefer hands-on learning?

We are offering a 5-day intensive Boot Camp where you will learn and master the entire EBP process from beginning to end. Take advantage of our retreat-type setting to focus on your project, collaborate with peers, and get the expertise and assistance from our faculty.

Appendix B: Literature Search

Database/Resource Searched	Keywords/Phrases Used	Limiters Used	Number of Results from Search	Number of Pieces of Evidence Selected for Use In Paper
Joanna Briggs Institute (JBI)	"patient remind*" AND "mailed remind*"	2011-current	0	0
Cochrane Library	"patient remind*" AND "mailed remind*"	January 2011-current	7	0
CINAHL	"patient remind*" AND "mailed remind*"	January 2011-current English Language Scholarly (peer reviewed) journal	15	4
PUBMED	"patient remind*" AND "mailed remind*"	Within past 10 years, guidelines	152	1
Medline with full text	"patient remind*" AND "mailed remind*"	English language, Past 10 years, scholarly (peer reviewed)	71	1
	List the Title of the Article/Original Piece of Evidence that contained the "Citations Chased"		**Number of Pieces Searched**	**Number of New Pieces of "Chased"**

				Evidence Selected for Use
Pieces of Evidence selected that were "Citation Chased" from systematic reviews, evidence summaries, guidelines, etc.	A randomized intervention of Reminder letter for Human Papillomavirus vaccine series completion	N/A	1 (from Cochrane Library)	1
		N/A		
		N/A		
		N/A		
		N/A		
	List the Title of each of the Journal(s) that were "Hand Searched"	**List the Years/Time Frame that was Searched**	**Number of Pieces Evaluated**	**Number of New Pieces from "Hand Searching" Selected for Use**
Pieces of Evidence selected that were "Hand Searched" from the table of contents of specific journals	Journal of Nurse Practitioners	2011-current	**2**	0
	Valpo Scholar- The effect of patient reminders on osteoporosis screenings 2014	2011-current	**1**	1
	Google Scholar-University of Mississippi- Increasing Osteoporosis Screening rates	2011-current	**1**	0
	CDC: Client (patient) reminder planning guide	2011-current	**1**	0
	Health Partners	2011-current	**1**	1
			<u>Total</u> Number of pieces of Evidence	10

Appendix C: Evidence Table

Lead Author/ Year/Quality	Purpose/ Design/Sample	Interventions	Measurement/ Outcomes	Results/ Findings	Strengths/ Limitations
Level I Evidence					
Jacobson et al., 2018. CASP tool: high quality	To evaluate effectiveness of various types of reminder and recall interventions to improve (preventative care) immunization rates. SR of 27 of RCTs *N*=81,100 participants including women age 65 years and older	Mailed letter reminders versus recall	320 per 1000 Control group of mail reminder who had receipt of preventive care (immunizations) 412 per 1000 with intervention of mailed reminder who had receipt of preventive care (immunizations) with an unknown period of time	RR = *1.29, 95% CI [1.21-1.31]* Preventive care (immunization rates) increased with mailed reminders 32% (control group) compared to 41.2% of the intervention group	Strength: Moderate evidence grade per study Limitations: Did not focus specifically on DXA

Level II Evidence					
Hirko et al. 2020. CASP tool. Moderate quality	To determine if motivational message reminder increased preventive care (colorectal cancer [CRC]) screening rates). RCT *N* = 7,812 adults aged 50-75	Mailed motivational message screen reminder or standard invite letter stating patient was due for preventive screening for a one-time mailing	Participation of preventive care (CRC), date of completion, follow up testing. Outcomes: Preventive care (CRC screening) participation within *6 months* after the mailed reminder letter.	Preventive care (CRC) participation increased with the intervention. Motivational message screen reminder) by 30.1% versus the control standard group at 22.5%. Intervention group had 49% higher odds of preventive care (screening) than control (OR = 1.49, 95% CI = 1.34, 1.65*).*	Strengths: Lost cost intervention. Limits: adults ages 50-75 and those above 75 years of age were not screened, within 1 rural community health system; did not focus specifically on DXA

Levy et al., 2013 CASP tool: moderate quality	Main objective was to complete preventive care (colorectal cancer) RCT *N* = 743 patients at 16 rural family physician offices for women ages 65 and older	Patients randomly placed in 1 of 4 groups: (1) usual care; (2) physician chart reminder; (3) mailed reminder with FIT reminder magnet (4) mailed reminder with telephone call to provide education/ explanation	Main outcome: Completion of preventive care (CRC screening). Secondary outcome: FOBT, FIT, barium enema, flex sig.	Preventive care (CRC screening) completed: (1) usual care (17.8%) (2) chart reminder 20.5% (3) mailed reminder group (4) mailed reminder plus telephone 57.2%	Strengths: Setting of PCP office who randomized patients who needed to be screened. Limits: Rural Iowa with limited geographic region.

Coronado et al., 2018. CASP tool: high quality	To determine effectiveness of mailed reminder with materials to improve preventive care (completion of colorectal screening increase FIT rates). RCT. *N* = 41,193 eligible participants that were overdue for their colorectal cancer screening	Generation of mailed reminders with patient materials for preventive care (CRC screen) versus Standard process of ordering screens during routine clinical encounter	Intervention group: *N*=21,134) Mailed reminder letter, intro letter and FIT kit packet; Control group is usual care (*N* = 20,059).	Intervention group had higher preventive rate of FIT test (from 13.9% to control group 10.4%) *95% CI, 0.1%-6.8%)* Intervention group improved preventive care (CRC screen) rates with mailed reminder.	Strengths: increase in preventive care (CRC screening). Limitations: Some of the preventive care (CRC samples were unable to be processed due to missing collection dates.)

Chan et al., 2017. CASP tool: high quality	To evaluate if a family PCP signed reminder letter to women overdue for preventive care (screening mammograms) prompted rescreening in 6-month period. Randomized double-blind trial. *N* = 822 PCP. *N* = 5638 women participants	Signed Reminder letters by PCP to women overdue for preventive care (mammogram)	Those who received preventive care (screening mammogram).	Those is the intervention group were more likely to get preventive care (mammogram) than control arm (RR = 1.41; 95% Ci: 1.30-1.54)	Strengths: Double blind study reminder for overdue for preventive care (mammogram) Limits: Study did not evaluate if reminder letters were effective if signed by another healthcare professional.

Warriner et al., 2012. CASP: moderate quality	To determine if mailed reminder with brochure improved preventive care (osteoporosis screening). RCT. *N* = 2997 women age 65 and older	Mailed reminder letter with brochure explaining how to self-schedule a DXA screen versus usual care	DXA completion was outcome. Intervention group had 977 participants and usual care (control group) had 2020 participants	17.3% of intervention group completed the DXA scan compared to 5.2% (*control) (p < 0.0001)*	Strength: The study supported efforts at patient activation of screening. Limiter: Study conducted at single academic health system.

Lipscomb et al., 2020. CASP=moderate quality	Identify adherence to preventive care (mammogram) screening guidelines for Breast Cancer survivors and Female first-degree relatives (FDRs) *N* = 95 eligible breast cancer survivors. *N* = 83 eligible FDRs. RCT.	High intensity: brochure, phone counseling, mailed patient reminders, communications with PCP Low intensity: brochure only	Measurements were taken at 3- and 12-month f/u questionnaires.	12-month mammograms at low intensity group: survivor group 24 subjects, FDRs group 34; 12-month mammograms at high intensity group: survivor 30 subjects, FDRs 23 subjects. High intensity had 60% FDR increase in screening at 12 months was 79.2% and low intensity was 66.7% at 12 months.	Limiters: many subjects were ineligible and dropped out. Strengths: Intensity group was improved in this study from this intervention.

Level VI Evidence					
Black, 2014 Melnyk & Fineout-Overhold tool: High quality	To determine if patient mailed reminders increase bone mineral density screen rates *N* = 47 female participants EBP project	Mailed patient reminder	Participants participating in bone mineral density screening in 12-week period improved screening from 17.07% to 31.40%	Larger population from patients of physicians was 87.23% and patients of the NP was 12.77%. (X^2 = 9.824, *p*=.002)	Strength: This intervention proved to be a successful EBP project. Limits: within 12-week period of 47 participants.

Level VII Evidence					
CDC Client (Patient) reminder planning guide. (2021).	--	Evidence based intervention to use patient reminders (Letter, postcard, email, text or phone call) to prompt patient screening.	To increase screening rates.	--	--
Health Partners	--	Contact with patients when preventative screenings are due either by email, social media, alerts on insurances.	Increase preventative screening to detect diseases earlier.	--	--

Appendix D: CITI Program Verification Certificate

CITI PROGRAM

Completion Date 23-Mar-2021
Expiration Date N/A
Record ID 41744284

This is to certify that:

Kristine Davis

Has completed the following CITI Program course:

Not valid for renewal of certification through CME.

Group 1: Social Behavioral Educational Researchers
(Curriculum Group)
Group 1: Social Behavioral Educational Researchers
(Course Learner Group)
1 - Basic Course
(Stage)

Under requirements set by:

Valparaiso University

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?wf2280811-b937-4b20-97a7-46cd1062ae01-41744284

Appendix E: IRB Approval

Goshen Hospital
200 High Park Avenue
Goshen, IN 46526

FWA Number 00000079
IRB Number IRB00000806
IORG Number IORG0000484

DATE: July 30, 2021

TO: Kristine (Kacy) Davis
FROM: Goshen Hospital Institutional Review Board

PROJECT TITLE: [1791289-1] Increasing Osteoporosis Screening in Women Over 65 and Older in the Primary Care Setting

REFERENCE #:
SUBMISSION TYPE: New Project

ACTION: DETERMINATION OF EXEMPT STATUS
DECISION DATE: July 30, 2021

REVIEW CATEGORY: Exemption category

Thank you for your submission of DNP Project - Increasing Osteoporosis Screening in Women 65 and older in Primary Care Setting materials for this project. The Goshen Hospital Institutional Review Board has determined this project is EXEMPT FROM IRB REVIEW according to federal regulations.

We will retain a copy of this correspondence within our records.

If you have any questions, please contact Debra Filley at 574-364-2476 or dfilley@goshenhealth.com. Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within Goshen Hospital Institutional Review Board's records.

Generated on IRBNet

Appendix F: Patient Reminder Letter

Goshen Physicians

October 12, 2021

Dear Patient First Name,

We want to help you stay active and keep your independent lifestyle. That's why it's important to know your bone health. The U.S. Preventive Services Task Force recommends screening for osteoporosis in women 65 years and older. A bone density test helps determine if you have osteoporosis, a disease of the bones. It measures the amount of calcium and other minerals in your bones. Bones that become less dense become weaker and are more likely to break.

Our records show that it's time for you to have a bone density measurement test. It takes only a few minutes, is painless and non-invasive. **We can help you schedule a bone density test at a convenient time for you. Simply call our office at (574) 848-4039.** If you already had a bone density test, please contact our office so we can update our records.

Screening for osteoporosis can help you get the treatment you need to reduce your risk of broken bones, particularly hip fractures. Osteoporotic fractures can limit mobility, cause chronic pain and lead to loss of independence and decreased quality of life.

Based on your screening results, your doctor can recommend medication to support bone health. Your provider also can help you identify ways to add calcium, vitamin D and exercise into your daily routine.

Please help us in our efforts to take action for bone health on October 20, when we recognize World Osteoporosis Day. It's an opportunity to raise awareness about the prevention, diagnosis and treatment of the disease.

You can learn more about the risk of fracture by reviewing the enclosed osteoporosis risk checklist. It gives you helpful information about factors that may affect your bone density. Please contact our office if you have questions or would like more information about osteoporosis.

Sincerely,

Daniel Berger, MD
Mackenzie Shireman, DNP
Kacy Davis, FNP

FAMILY MEDICINE | BRISTOL

304 E. Vistula Street
Bristol, IN 46507

GoshenHealth.com

t (574) 848-4039 f (574) 848-4076

Appendix G: PowerPoint to key stakeholders at Family Practice Setting

10/19/21

Increasing Osteoporosis screening in women among 65 years of age and older in the primary care setting

Kacy Davis, MSN, RN, FNP-C, FNP-BC
DNP Candidate 2022

"I have neither given or received, nor tolerated others' use of unauthorized aid."

1

Background

- "Silent" disease of the bone
- Impaired remodeling process
- Implications resulting from a fracture
- Conditions related to Osteoporosis
- Costs associated with diagnosis
- Economic burden

2

Reasons why screening does not happen

- Many barriers : socioeconomic, hours available for screening, providers may not be aware they have not been screened
- Marketing stresses cancer screenings more often than osteoporosis screenings

3

Purpose

- To increase Osteoporosis screening among women aged 65 and older
- PICOT: Among women ages 65 and older, what is the effect of patient mailed reminders on osteoporosis screening rates via Dexa scan, as compared to previous screening rates over a 12-week time period?
- Start time will be on October 20 correlating with National Osteoporosis Day
- Patient mailed reminders will be sent out today (10/14/21)

4

Statistics

- 61.1% who have had DEXA
  - 104 out of 161 (MD)
    - 64.6% with Dexa on EMR
  - 17 out of 37 (NP)
    - 45.9% with Dexa on EMR
- 38.9% who have not had DEXA for both NP & MD
  - 57 out of the 161 (MD)
    - 35.4% without Dexa on EMR
  - 20 out of 37 (NP)
    - 54% without Dexa on EMR

5

6

Conclusion

- Osteoporotic fracture rates are increasing
- Grade B recommendation that Dexa Scans should be performed for women age 65 years and older per USPSTF
- Current screening rates in office can be higher
- This intervention serves to increase Osteoporosis screening among this population within this family practice
- Evidence suggests mailed reminder may increase screening rates

7