

A Quality Improvement Endeavor Improving Depression Screening for Rural Older

Adults

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Abstract

Purpose: Develop a quality improvement plan to begin a biphasic depression screening process for rural people 65 years and older residing in two counties in south-central Nebraska. Sample: Project initiation involved retrospective chart review of a convenience sample of 50 adults, 65 years or older with a known diagnosis of anxiety or depression residing in south-central Nebraska.

Method: A quality improvement design based on the plan-do-study-act (PDSA) model, charts a prescribed four-stage cyclic learning process while compatible with the Promoting Action on Research Implementation in Health Services Framework (PARIHS) model for evidence-based practice (EBP), emphasizing the significance of organizational culture. An interprofessional (IP) small-team approach provided momentum into full organization expansion through a three-cycle operational plan.

Findings: The project used descriptive statistics providing aggregate demographic data while delivering a means to measure progress towards goal acquisition.

Conclusion: Use of the convenience sample indicated the need to standardize secondary depression screening processes within a vulnerable rural population. Outcomes demonstrate goal achievement with the consistent use of electronic medical record (EMR) supported Patient Health Questionnaire (PHQ-2) data for the older adult. However, a breakdown occurred when the organization was reliant on face-to-face communication in notifying the healthcare provider when the PHQ-2 triggered the need for the more detailed PHQ-9. A gap in primary care for older men discovered with implications for improving the accessibility of healthcare in the future.

Keywords: Rural depression, depression screening

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Adults

Rural people with behavioral and mental health illness receive less psychiatric care compared to people with behavioral and mental illness living in more populated areas. Proportionately, more people who are older live in rural populations and encounter a wide range of disease burden. Aging and rurality contribute to the susceptibility of those confronting chronic illness (Watanabe-Galloway, Madison, Watkins, Nguyen, & Chen, 2015). Specifically, long-distance travel to access specialty health care, getting by with not enough available local primary health providers, and experiencing feelings of displacement when engaging in health care from more urban areas adds to vulnerability. Moreover, rural elderly have more medical and mental health care needs compared to people residing in urban areas (Snyder, Jensen, Nguyen, Filice, & Joynt, 2017).

Prevalence

The known correlation between aging and risk for depression is well studied with current research continuing to indicate an increased incidence of depression with aging (Sjöberg et al., 2017; Verhoeven et al., 2014). Depression prevalence is similar between rural and urban populations; disconcerting is the variance between the amount and quality of mental health care available in rural areas due to a scarcity of resources (Watanabe-Galloway et al., 2015). Additionally, rural populations comprised of higher numbers of geriatric adults indicate people often experience inadequate diagnosis and are under treated for depression. Predictions specify that by 2020 depression will be an uppermost component of worldwide disease problems (Davidson et al., 2018). Presently, 17% of Americans are impacted by depression (LeBlanc et al., 2015). The economic burden for depression in the United States (US) was assessed at 98.9 billion in 2010 rising 27.5% from 2005 measurements (Greenberg, Fournier, Sisitsky, Pike, & Kessler, 2015). In 2016, an estimated 4.8% of the US adult population above the age of 50 had a major depressive episode with 64% experiencing severe impairment (National Institute for Mental Health, [NIMH], n.d.a).

Risk Factors

Adults at higher risk for depression are female, advancing in age, living alone, or disabled, less educated, experiencing high levels of stress, chronic disease, and use multiple pharmacological agents. Additionally, personal or family history of depression and struggles with substance abuse contribute to the risk of depression development (NIMH, n.d.b). Estimates of major depression in community dwelling older adults are relatively low ranging from <1-5%. Unfortunately, the risk for depression increases (11.5%) in the hospitalized elder and (13.5%) for those requiring home health care (Centers for Disease Control & Prevention [CDC], n.d.a).

Depression Management

Depression occurring in later life is a severe affliction often accompanied by medical morbidity, mental decline, and risk of suicide (W. Taylor, 2015). Unrecognized depression contributes to a pattern of impaired activities of daily living and worsens subsequent medical conditions such as diabetes, high blood pressure, heart disease, chronic obstructive pulmonary disease, and chronic pain (Choi, Kim, Marti, & Chen, 2014; de Groot, Doyle, Averyt, Risaliti, & Shubroo, 2015; Holt, de Groot, & Golden, 2014; Lin, Yen, Chen, & Chen, 2013; Yohannes & Alexopoulos, 2014). Also, depression in the older adult connects to rising health care costs nationally (Egede, Bishu, Walker, & Dismuke, 2016; Bock et al., 2016)

A practical answer for clinicians caring for older people in primary care is the identification of depression when it presents. Secondary prevention strategies seek to find disease while moving towards earlier management, expecting to improve prognosis and give cost-effective care (Institute for Work & Health, 2015). Depression screening approaches involve minimal system expenditure capitalizing on the free availability of high-quality depression screening instruments and system-wide technology support.

Rural Central Nebraska

An operational definition for rural health care is the delivery of services by professionals to people residing in sparsely occupied regions (Gessert et al., 2015). The population of interest is 6,850 people living within 1,262 square miles. The counties are defined as frontier (population density of 5.6 - 6.5 people per square mile) and are made up of individuals who are aging, involved in agriculture, and have a higher than the average number of people dealing with poverty compared to other rural communities in the nation (Suburban Stats Inc, 2014). The population is mostly Caucasian (97.8 %) with Native American and people of a mixed race making up the small

minority of non-White. Statistics indicate a close divide along gender lines with the number of men in the state at 50.4% compared to the number of women at 49.6%. Multiple agri-businesses support the economy of the region where revenue generated based on crop and livestock production with small businesses providing services to the residents, farmers, and ranchers of the community. Although largely middle class, 13.6% of the population live in poverty and an equal number (13%) are uninsured (United States Census Bureau, n.d.).

Health department data indicate during 2014 Nebraska men died from suicide at a rate of 12.8% compared to a rate of 0.02% for women over the age of 65 years (Nebraska Department of Health and Human Services, 2014). The Nebraska Behavioral Risk Factor Surveillance System (BRFSS) data collected during 2010-2014 indicate more days when mental health was not good in the last month contrasted to Nebraskans overall. While 10.1% of people in these counties report a diagnosis of diabetes, 6.1% report a diagnosis of cancer, and 4.2% report cardiovascular disease (CDC, n.d.b.). Aggregate data including the predominance of chronic disease, rural communities comprised of proportionally higher numbers of geriatric people, and high county rates of suicide in men indicate a gap in care and signifying unidentified adult depression.

Theoretical Framework

Quality health care includes the use of evidenced-based practice endorsing the benefit of research to resolve problems presenting in day-to-day nursing and advanced practice-nursing clinical work. Depression screening guides better diagnosis and treatment resulting in improved quality of life and cost savings (Dham et al., 2017; Prasad et al., 2014; Rhee, Capistrant, Schommer, Hadsall, & Uden, 2017). Connecting the science to the practice environment is a challenge, a quality improvement (QI) model is critical in extending new ways to support expert clinicians as they take on changing practice patterns. The plan-do-study-act (PDSA), QI model

charts a prescribed four-stage cyclic learning approach to adopt changes emulating the scientific method of creating a hypothesis, accumulating data to test the hypothesis, examining and deciphering the results while making inferences to repeat the hypothesis. The approach is classic, pragmatic and intentional in fostering small changes to test interventions allowing for rapid change and adaptation according to feedback while generating the freedom to learn and act (M. J. Taylor et al., 2013).

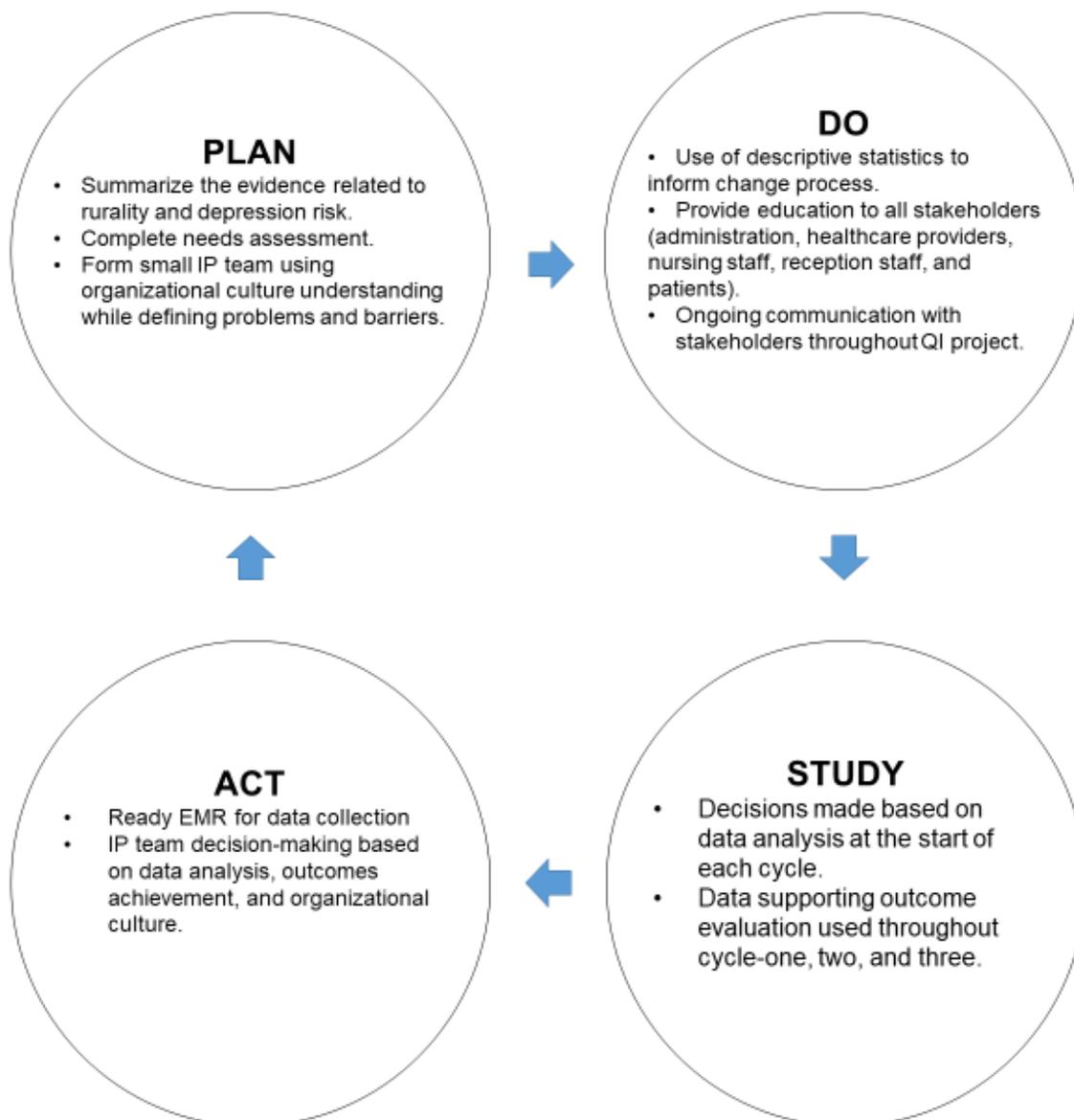


Figure 1. Plan-do-study-act for Rural Depression Screening Implementation (M. J. Taylor et al., 2013).

A common perception now exists signifying that practice change implementation requires complete system alteration implicating both the individual and the organization. The evidence-based practice (EBP) model was chosen for its significant regard of organizational culture and compatibility with the PDSA, QI model is the Promoting Action on Research Implementation in Health Services Framework [PARIHS] (Kitson et al., 2008). The PARIHS theorists endorse a foundational two-phase application progression by first engaging conversation and understanding about scientific evidence and its reliability within professional and patient context. The second phase requires assessment of regional data needed to measure existing practice and oversee future practice (Hutchinson, Wilkinson, Kent, & Harrison, 2012). The PARIHS framework provides a structure for implementation of research into practice bearing in mind the interchange of three core elements, effective implementation signified as a purpose of the nature and type of evidence, the traits and characteristics of the environment in which the evidence is being introduced, and the way the process is expedited.

Methods

Design

A quality improvement design using descriptive statistics involving retrospective chart review. The Institutional Review Board (IRB) at the University of South Alabama approved the project as Quality Improvement (ID: 1149283-1). The agency independently has no IRB review processes; project approval was sought and issued by the Administrator and Chief Executive Officer (CEO) sanctioning the completion of the QI project.

Sampling

The study consists of a convenience sample involving the medical records of patients age 65 and older with known depression or anxiety receiving primary health care services in a frontier setting. To be included in the study, the participant must be 65 years or older, with known chronic illnesses, and offer consent to participate in the research at the time of clinic sign-in. Exclusion criteria include those 65 years and older with no known chronic illnesses or anyone under the age of 65. A total number of 50 participants were involved in the initiation of the project.

Measures

Tools

The Patient Health Questionnaire PHQ-9, and the particularly-short PHQ-2, are used commonly in primary care and community settings (Gelaye et al., 2016; Kocalevent, Hinz, & Brähler, 2013; Kroenke, Spitzer, & Williams, 2001; Manea, Gilbody, & McMillan, 2015). The PHQ-2 and PHQ-9 are available on open access and are extensively studied instruments for screening depression corresponding to the DSM-IV major depressive criteria. Evidence as recent as 2013 indorses reliability and validity of the PHQ-9 for measurement of depression in the general population (Kocalevent et al., 2013). The notably brief two item PHQ-2 also proves reliable and valid with a strong construct and good criterion validity in recent studies (Gelaye et al., 2016).

Operational Plan

The systematic process from start to conclusion involves three cycles using the PDSA quality improvement model. Cycle-one begins with a study using retrospective chart review for 50 clients who met inclusion criteria. A small interprofessional (IP) team was established and comprised of advanced practice nursing, a physician, the Director of Informatics, the Director of Nursing, and the Chief Executive Officer. The purpose of the IP team during planning phase is to review cycle-

one study results, define problems and barriers, and determine next steps. Team action phase involves work to ready system's electronic medical record (EMR) for data collection using depression-screening reports. The aim of the teamwork at this point is to ease provider notification while determining how best to complement nursing workflow patterns learning about the PHQ-2 and PHQ-9 use in clinical practice. Finally, cycle-one do phase involves the small IP team completing eleven days of depression screening on eligible patients.

Cycle-two study phase begins with chart review involving all patients screened in the previous eleven days (during cycle-one) for depression. Cycle-two planning phase includes small IP teamwork to review cycle-two study results while determining the plan for full implementation of the project. Cycle-two action phase encourages the team to remain vigilant with awareness of communication needs for all system stakeholders while activities include educational and team building endeavors supporting the large IP team group formation. Finally, the do phase of cycle-two involves the full implementation of depression-screening processes across the system.

Cycle-three study phase involves completing data analysis on all participants screened during cycle-two. Results from the cycle-three study phase provide data while further guiding the large IP team decision-making through remaining cycle-three phases (plan, do, act). Cycle-three positions the organization to sustain ongoing secondary prevention interventions that promote early disease identification for depression in a vulnerable rural population.

Data Analysis

Data analysis using Statistical Package for the Social Sciences (SPSS) was completed. Cycle-one data analysis involved a randomized retrospective chart review on 50 patients 65 years and older with a known existing anxiety or depression diagnosis and conducted using electronic medical records (EMR) reviewed from January 2014 through December of 2017. Data collected

from the convenience sample included age, gender, visit type, primary medical diagnosis, and any evidence indicating prior completion of secondary screening for depression (See Table 1 for cycle-one characteristics).

The majority of patients in the convenience sample were within the age range of 65-74 years (54%) with an appreciable 18% of the patients in the advanced age group of 85-99 years. The convenience sample was comprised of 64% females and 36% males. Patients in the sample sought care 48% of the time for chronic disease follow-up, 32% for acute episodic care, 12% for well visits, and 8% for post-hospitalization follow-up. Mental and behavioral disorders had the highest occurrence rate at 22.4% for primary medical diagnosis in this sample while disease involving circulation and musculoskeletal problems together tied for second with a 16.3% primary diagnosis occurrence rate. No evidence found indicating documentation of depression screening into the EMR was occurring.

Results

A primary care health care system consisting of four Rural Health Clinics (RHCs) staffed by five advanced practice registered nurses (APRNs), a physician, six nurses, one medical assistant, three reception staff members, the Director of Nursing Informatics, the Director of Nursing, and the Chief Executive Officer; were part of a team strategy to implement a biphasic secondary depression screening process for the older adult in rural primary care. All people ages 65 years and over scoring positively on the PHQ-2 trigger the completion of the PHQ-9 (while the client is present in the clinic) allowing provider consideration for initiation or furthering of existing depression treatment. The QI project aligns with the organization's initiation for using the Centers for Medicare and Medicaid Services (CMS) guidelines ensuring EMR based PHQ-2 screening for all rural people served by the system.

The overarching aim of the project was evaluated by measuring PHQ-2 and PHQ-9 screening rates. Cycle-two small-team data analysis results show depression screening (using EMR supported PHQ-2 embedded into clinic check-in processes) increased by 92.9 % while provider collected PHQ-9 screening (triggered by positive PHQ-2 findings) increased by 42.8%. Out of 14 patients participating during cycle-two, seven patients (50%) triggered the need for a complete PHQ-9 screening, and seven patient (50%) needed no further screening. Of the four out of seven patients, (57.1%) who triggered the need for further screening received no additional assessment while the remaining three patients (42.8%) obtained the needed additional screening. Demographic data from cycle-one mirrors the characteristics of the data collected within the convenience sample (See Table x). (See Table 1 for cycle-two characteristics).

The largest percentage of the patients (57.1%) seen during cycle-two were between ages 65-74 years, 35.7% males and 64.3% females, most people seeking health care needed chronic disease follow-up and the top primary medical diagnosis was disease of the musculoskeletal system at 28.6%. Notably, half of the patients in the population of interest entered local primary rural health care having the risk for depression as identified by the PHQ-2. Biphasic depression screening did not significantly affect provider action towards medication management or referral to mental health services.

Cycle-three full-system implementation results illustrate depression-screening involving the use of the EMR embedded PHQ-2 increased by 84.3%, patients refused by 10.5%, while missed assessment occurred 5.2% of the time. Provider collected PHQ-9 screening (triggered by positive PHQ-2) findings increased by 15.25%. Out of the 153 patients participating during cycle-three, 94 patients (61.4%) required no further PHQ-9 assessment. Fifty-nine patients (38.5%) scored positively on the PHQ-2 indicating the need for additional screening, however, 48 (81.3%) did not

receive the additional PHQ-9 screening, and two patients (3.38%) refused PHQ-9 screening. (See Table 1 for cycle-three characteristics).

Consistent with cycle-one and cycle-two data, demographic statistics signal the highest percentage of patients seen were between ages 65-74 years (45.7%), males 37.3% and females 62.7%. Flu seasons influence on the use of the health care system reflected in cycle-3 findings, 54.2% of patients seen for acute episodic needs with a disease of the respiratory system being the primary reason for seeking care. Remaining consistent with cycle-two conclusions biphasic depression screening did not significantly affect provider action towards medication management or referral to mental health services during cycle-three implementation.

Table 1

Characteristics of participants across cycles one, two and three.

Characteristic	Cycle 1 n (%)	Cycle 2 n (%)	Cycle 3 n (%)
Age	50 (100)	14 (100)	153 (100)
65-69 years	16 (32)	5 (35.72)	40 (26.1)
70-74 years	11 (22)	3 (21.4)	30 (19.6)
75-79 years	7 (14)	2 (14.3)	39 (25.5)
80-84 years	7 (14)	1 (7.1)	21 (13.7)
85-89 years	4 (8)	3 (21.4)	13 (8.5)
90-94 years	3 (6)	0 (0)	6 (3.9)
95-99 years	2 (4)	0 (0)	4 (2.6)
Gender	50 (100)	14 (100)	153 (100)
Female	32 (64)	9 (64.3)	96 (62.7)
Male	18 (36)	5 (35.7)	57 (37.3)
Reason for Health Care	50 (100)	14 (100)	153 (100)
Well visit	6 (12)	2 (14.3)	6 (3.9)
Acute episodic visit	16 (32)	5 (35.7)	83 (54.2)
Post hospitalization follow-up	4 (8)	0 (0)	5 (3.3)
Chronic disease follow-up	24 (48)	7 (50)	59 (38.6)
Primary Medical Diagnosis	49 (98)	14 (100)	153(100)
Certain infectious and parasitic disease	1 (2)	1 (7.1)	1 (0.7)
Neoplasms	1 (2)	1 (7.1)	2 (1.3)
Diseases of the blood	0 (0)	0 (0)	2 (1.3)
Endocrine, nutritional, metabolic disease	4 (8.2)	1 (7.1)	12 (7.8)
Mental & behavioral disorders	11 (22.4)	0 (0)	3 (2)

Diseases of nervous system	1 (2)	1 (7.1)	3 (2)
Diseases of eye & adnexa	2 (4.1)	1 (7.1)	2 (1.3)
Diseases of the ear & mastoid process	0 (0)	0 (0)	12 (7.8)
Diseases of circulatory system	8 (16.3)	1 (7.1)	16 (10.5)
Diseases of respiratory system	7 (14.3)	1 (7.1)	34 (22.2)
Diseases of digestive system	3 (6.1)	0 (0)	11 (7.2)
Diseases of skin/subcutaneous tissue	3 (6.1)	2 (14.3)	13 (8.5)
Diseases of the musculoskeletal system & connective tissue	8 (16.3)	4 (28.6)	33 (21.6)
Diseases of the genitourinary system	0 (0)	1 (7.1)	9 (5.9)
Prior EMR documentation -depression screening	0 (0)	NA	NA
PHQ-2 completion	0 (0)	14 (100)	153 (100)
No	0 (0)	1 (7.1)	8 (5.2)
Yes	0 (0)	13 (92.9)	129 (84.3)
Refused	0 (0)	0 (0)	16 (10.5)
PHQ-2 score indicating PHQ-9 need	0 (0)	7 (50)	59 (38.5)
Need for PHQ-9, No PHQ-9	NA	4 (57.1)	48 (81.3)
Need for PHQ-9, Yes PHQ-9	NA	3 (42.8)	9 (15.25)
Need for PHQ-9, Refused PHQ-9	NA	0 (0)	2 (3.38)
Provider Action based on PHQ-9 findings			
Medication management for depression	NA	7 (50)	9 (0.06)
No change in medication management	NA	2 (28.5)	3 (33.3)
Medication management adjustment	NA	0 (0)	2 (22.2)
No medication for depression initiated	NA	5 (71.4)	4 (44.4)
Mental Health Referrals	NA	0 (0)	153 (100)
Referral made	NA	0 (0)	5 (3.3)
No referral made	NA	0 (0)	43 (28.1)
Referral not indicated	NA	0 (0)	105 (68.6)

Discussion

Data analysis involving the convenience sample provided compelling evidence reinforcing the need for system change; there were no indications of documentation of depression screening within the EMR upon reviewing cycle-one data. Recognition of depression in the elderly is complicated by medical conditions and use of pharmacological agents that can mimic symptoms of depression (such as insomnia, confusion, weariness, and nutritional deficient) while often disease such as diabetes, cancer, central nervous system disorders and arthritis are comorbid with depression (Groh & Dumlao, 2016). Research illustrates the burden of identifying depression is

eased when using an aggressive approach to screening high-risk populations leading to a better patient understanding of disease process and enormous financial savings when depression is recognized and treated where preexisting co-morbid disease already exists (Egede et al., 2016).

The QI project aim involved the implementation of depression-screening practices where previously no screening practice existed. The characteristics of the convenience sample indicate that over half of the population of interest is between ages 65-74. Statistically, the counties of interest demonstrate an average life expectancy for men being 76 years and women 82 years of age (LeDuc Media, 2014b, 2014a). The average client in the population will need health care services for many years; for some people (18%) life will occur into the advancing ages of 85-99 years and could mean decades of needed primary care. An aging population creates a higher risk for depression, the organization positioned for the future using strategies that ease depression diagnosis, encourage meaningful conversation with providers, monitor for disease, and initiate early treatment when disease recognition occurs.

A regional gap exists in providing primary health care services for men (who make up half of the population) however, men are seen for health care only one-third of the time compared to the women in the same counties. Literature review points to a larger national gap in understanding depression in men. A systematic review examining 20 databases found 16 qualifying studies, but only four studies spoke to depression in men (Devries et al., 2013). Future consideration involves redesigning health care systems to recognize mental health and engage both men and woman while providing affordable and accessible care.

The local health care system is in the fifth year of EMR use. A principal finding in a recent study by Whitacre (2017) involving over 1,250,000 providers indicates EMR implementation rates surprisingly rise with the degree of rurality. The depression screening QI initiative supports the

advantages of rural adoption of the EMR explicitly easing secondary prevention screening efforts for a population of interest. The PHQ-2 rates improved throughout the change cycle in part by becoming a component of the electronic admission process. The PHQ-9 rates did not garner significant improvement during PDSA cycle-3. The PHQ-9 screening process lacked connection to EMR use and relied on the PHQ-2 screening to prompt an in-person communication between nursing and the health care provider; in-person communication often failed to notify the health care provider of the need for further assessment involving the PHQ-9 during the time the patient was in the clinic. The EMR facilitates the QI evaluation processes while sustaining goal driven change initiatives proving to be an invaluable asset to population-based care.

Implications

Planning future care for the population involves continuing advocacy for local, state, and federal policy efforts building an increasingly robust network of mental health providers available both in-person and through telehealth services. The pressing need to provide options for patients in search of mental health counseling services creates the opportunity to explore novel business strategies such as outpatient group behavioral health. Additionally, future planning includes consideration of how to offer options outside of a clinic setting for depression screening while keeping the needs of men in mind. Progress made with EMR facilitation of QI endeavors positions rural nursing to continue to define and provide population health while mastering value-based care.

Limitations

The project results are not generalizable to other elderly populations with depression risk due to the small and homogenous sample. Regarding representation, an additional QI study occurred at the same time as the depression QI study; asking the patient to answer more questions than

typical may have affected willingness to participate. Autonomy is highly valued by rural people and creates an impact on the use of health care services.

Conclusion

Promoting the improved quality of life and well-being for rural Nebraskans is increasingly vital as rural demographics continue a downward population shift with communities proportionately more comprised of rapidly aging adults. Nebraska's trend shows older adults live in small towns during late-life and subsequently often require more health care and treatment for multiple disease entities. Rurality adds to the complexity of care. Secondary prevention measures using screening strategies assists health care providers to identify depression when it presents while moving towards the earlier management of disease expecting to improve prognosis and save expense.

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