Comprehensive assessment of the needs of Chronic Obstructive Pulmonary Disease patients residing in East-central Indiana and west-central Ohio

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Abstract

Purpose: To conduct a needs assessment and develop an action plan to implement early interventions to improve health outcomes of chronic obstructive pulmonary disease (COPD) patients residing in east-central Indiana (IN) and west-central Ohio (OH). Sample: A convenience sample of 70 adult COPD patients in east-central IN and west central OH.

Method: The Vulnerable Populations Conceptual Model (VCPM) was used to construct a survey that assessed available resources, relative risk, and health status of COPD patients. The

thirty-item survey was distributed in two pulmonary practice sites and a rural hospital's outpatient services.

Findings: The project used descriptive analysis and t-tests. Results demonstrate resource availability mean (M) 7.06 ± 1.88 (SD) out of 0 to 11, relative risks (M) 4.16 ± 1.25 (SD) out of 0 to 9, and health status (M) 5.36 ± 1.60 (SD) out of 0 to 9. Participants who had 2 or more co-morbidities and took 5 or more daily prescriptions were more likely to have increased emergency room (ER) visits and hospital admissions.

Conclusion: The results demonstrate the greatest frequencies for resource availability were education level and caregiver support. Low resource scores were found for available health programs and enrollment in them. Smoking and increased sadness were the greatest relative risks. Implications of the project support developing COPD interventions and programs that address smoking cessation, depression screening, and self-management that work to improve the health status of the population and improve their health outcomes.
Keywords: COPD, Rural, Vulnerable populations, Hospitalizations, Emergency room visit.

Comprehensive assessment of the needs of Chronic Obstructive Pulmonary Disease patients residing in East-central Indiana and west-central Ohio

Chronic Obstructive Pulmonary Disease (COPD) has a major impact on the lives and health of Americans. It exerts a huge cost on the health care system, taxing financial and medical resources. Early intervention can ease some of the burden and relieve strained resources in addition to reducing health care costs (National Committee for Quality Assurance, 2009).

Prior to developing an early intervention program, a comprehensive needs assessment is beneficial to establish potential needs and to guide informed decision-making (Issel, 2014; Witkin & Altschuld, 1995). The project objectives were to conduct a comprehensive needs assessment for COPD patients residing in a rural area and to disseminate the assessment findings to appropriate stakeholders. Future plans include utilizing the assessment findings to develop an action plan that will work to improve health outcomes.

Prevalence

In the United States (US) COPD affects more than 6.3%, an estimated 15 million, of the adult population with an increase in rural areas (Bellamy, Bolin, Nelson, & Gamm, 2011; Center for Disease Control and Prevention [CDC], 2014). It was the 12th leading cause of morbidity and the 3rd leading cause of mortality in the US with 133,956 deaths from COPD occurring in 2009 (American Lung Association, n.d.). In 2010, the total economic burden of COPD in the US was estimated at $49.9 billion (Qaseem et al., 2011). Prevalence is estimated at 15.8% for those age 45-64 years old diagnosed with COPD and greater than 23.7 % among those aged 65 years old and older. The states with the highest COPD prevalence rates are Kentucky, 9.3% and Alabama, 9.1%. Indiana COPD rate is 7.9% and Ohio is 7.1%. States with the lowest COPD rates are Minnesota and Washington, both at 3.9% (CDC, 2012).

Risk factors

COPD has several risk factors, some of which are modifiable. Smoking is the primary risk factor. Thirty-three percent of COPD patients have a history of smoking (CDC, 2012). Other modifiable risk factors include prolonged exposure to air pollution, second-hand smoke, occupational dusts and chemicals, and history of childhood infections. Sixty-nine percent of

patients with COPD are 45 years old or older. In 2011, COPD was almost twice as prevalent in females (10%) as male patients (6%) and four times as common in Caucasians as all other races combined. Heredity and low socioeconomic status are additional risk factors. Adults with a diagnosis of COPD asthma during their lifetime (47.2%) and those with an alpha-1 antitrypsin deficiency (1-3%) are at increased risk for developing COPD (CDC, 2012; Sandhaus, 2004). Poor and rural areas have been linked to increased COPD mortality rates (American Lung Association, n.d.). The association between these risk factors and COPD is not clear, but factors related to low socioeconomic status for example indoor and outdoor air pollutants, poor nutrition, crowding, infections have been indicated as exposures (Global Initiative for Chronic Obstructive Lung Disease, Inc., 2014).

COPD management

Clinical management of COPD is complex. Because the clinical progression is one of gradual impairment with episodes of acute exacerbation, COPD patients have increased emergency room (ER) visits, hospital admissions, and demands on acute hospital services (Bustacchini, Chiatti, Furneri, Lattanzio, & Mantovani, 2012). The COPD population is susceptible to receiving fragmented care due to movement from one health care setting to another. This process is laden with possibilities for adverse effects and poor outcomes (Long, 2012). Despite the need to reduce fragmented care for this population, few interventions have been developed to assist COPD patients and their caregivers transition out of the hospital into their home. This results in an increase in hospital readmissions (Coleman et al., 2004; Fromer, 2011)

Past research by Shelton, Sager and Schrader (2000) validates that individuals living alone,

with decreased ability to complete activities of daily living (ADLs), one or more co-morbidities, five or more daily prescriptions, an ER visit in past six months, frequent physician visits and one or more hospital admissions in a year are at higher risk for increased healthcare use (Shelton et al., 2000). Additional research (CIHI, 2013) identifies elderly age, people of color, and unemployment as predictors for increased healthcare use. Resources such as having a high school diploma, being married, maintaining employment, and having someone who helps with care are predictors for improved health outcomes in chronically ill patients (CIHI, 2013).

Rural east-central IN and west-central OH

The rural region of east-central IN and west-central OH includes Wayne County (Co), IN; Union Co, IN; Fayette Co, IN; Randolph Co, IN; Preble Co, OH; and Darke Co, OH. The Center for Rural Development (Purdue University, 2013) classifies Union Co, IN; Randolph Co, IN; Preble Co, OH; and Darke Co, OH as rural or an area without a city of 10,000 or more persons. Wayne and Fayette counties are classified as rural/mixed areas or a rural county with larger towns having a population of the largest city between 10,000-30,000 persons (Purdue University, 2013). Wayne County, IN, where a majority of the health care services resides, is located on US interstate 70. The nearest Trauma I hospital is St. Vincent Indianapolis Hospital, Indianapolis, IN, an hour and 18 minutes away and with the next largest hospital in Dayton, OH or Munice IN 45 minutes away.

Reid Hospital and Healthcare Services (RHHCS) in Richmond, IN, is the local hospital that services patients in five rural IN counties and two rural OH counties (Reid Hospital & Health Care Services, n.d.). Of their service population, 13.2% has a prevalence of COPD compared to 8.4% nationally. Concerning ER visits, 7.8% of RHHCS patients have had greater than two

visits to the ER in 2013 as compared to the national average of 6.5% (Professional Research Consultants, 2013)

Project importance

There is a growing body of evidence that recommends early intervention programs targeted for those with increased risk helps to improve health outcomes and reduce care costs (CIHI, 2013). A crucial point to effective early intervention is identifying the patients who will most likely benefit before they become frequent users of the health care system with increased hospital admissions (CIHI, 2013). An additional study by Coleman et al. (2004) reports results found advanced practice nurses (APNs) that implemented patient-centered interventions to assist elderly patients' transition out of the hospital and back into the home found those patients were half as likely to be re-hospitalized as patients who did not receive the interventions. The APNs had weekly contact with the patients by phone or home visit to monitor progress and communicate concerns between patients, their care givers, and primary care providers for approximately 24 days after discharge (Coleman et al., 2004).

Model & Application

Vulnerable Populations Conceptual Model

Vulnerable populations are defined as social groups who have an increased susceptibility to adverse health outcomes, among these are rural, poor, and elderly patients (Leight, 2003). The Vulnerable Populations Conceptual Model (VPCM) proposes there are inter-relationships between a vulnerable population's resource availability, relative risk, and health status (See Figure 1). Adapted from (Flaskerud & Winslow, 1998). The framework assumes that communities are accountable for the well-being of its members to offer resources and

opportunities to attain and preserve health. The VPCM concepts address: patient resource availability: a) socioeconomic resources (patient education level, marital status, employment, living arrangements) and b) environmental resources (health program options, access to quality health care, transportation); relative risk (the exposure to disease and poor health, lifestyle choices, certain demographics); and health status (mental, physical, and social well-being). A community with limitations in resource availability has an increase in relative risk potential. Increased risk affects the possibility of morbidity and mortality or the *health status* of the community. An increase in morbidity and mortality rates further deplete the amount of resources which results in poor health outcomes (Rawlett, 2011).

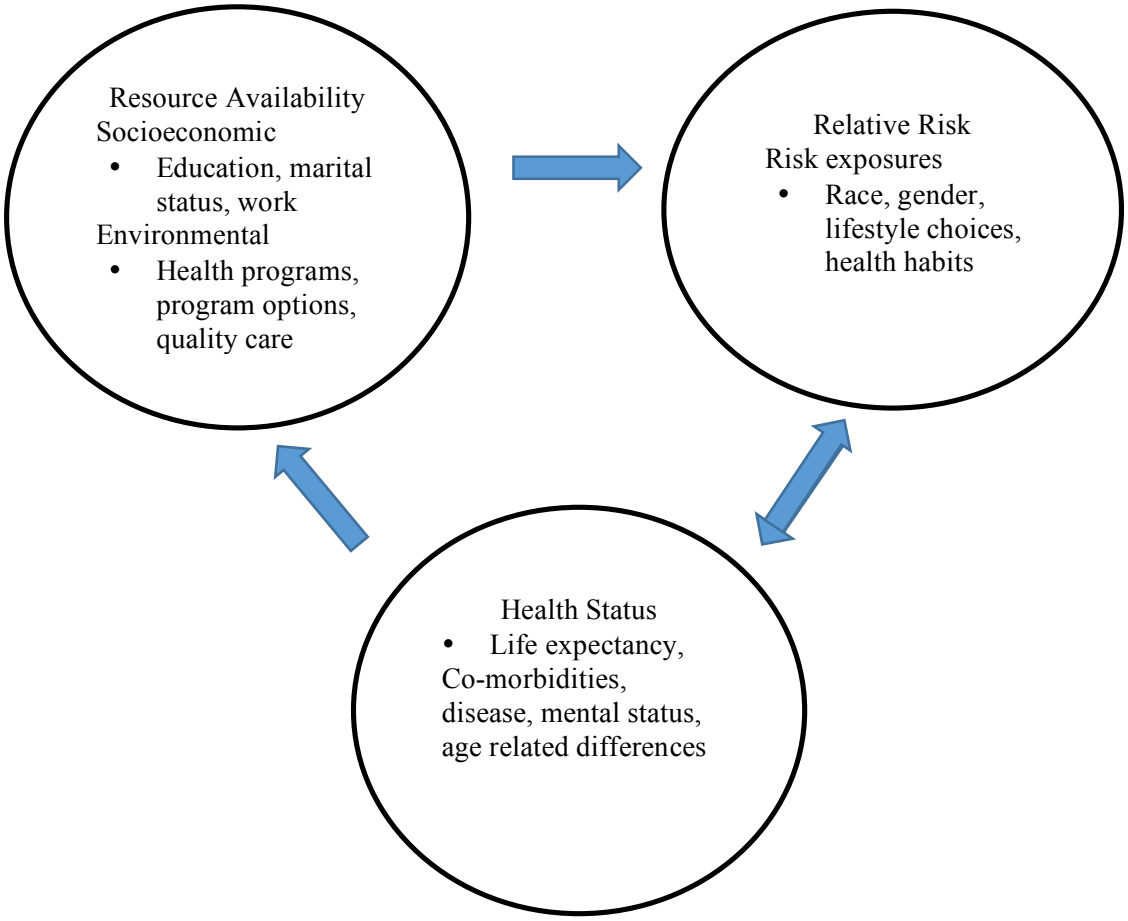

Figure 1. Vulnerable Populations Conceptual Model. Adapted with permission from Wolters Kluwer: Flaskerud, J. & Winslow, B. (1998). Conceptualizing vulnerable populations health related research. *Nursing Research, 47*, 69-78. Promotional and commercial use of the material in print, digital or mobile device format is prohibited without the permission from the publisher Wolters Kluwer. Please contact healthpermissions@wolterskluwer.com for further information.

Application of the VPCM to the project.

A vulnerability assessment can be used to identify limitations in resources resulting in higher risks for morbidity and mortality of the target population (Smith, 2011). The project purpose was to develop an action plan to provide early interventions and improve health outcomes by identifying the resource availability, relative risk and health status of rural COPD patients.

Method

Design

A descriptive statistics design was used to determine the population's resource availability, relative risk, and health status. The Internal Review Board (IRB) at the University of Cincinnati approved the project as a *not human subject research* (ID: 2014-1181). IRB approval was also granted by RHHCS.

Sampling

Methods of recruitment included advertising by posters and word-of-mouth strategies. Posters were placed at two pulmonary care practices and other RHHCS departments that serviced COPD patients (pulmonary rehabilitation, transitions services, disease navigators, and case management). Word-of-mouth strategies included verbal advertisement via social networking at the hospital and outpatient services.

Eligible subjects were adult males or females: (a) diagnosed with COPD, (b) utilizing

RHHCS for COPD management, (c) English speaking, (d) residing in east-central IN west-central OH. Non-eligible subjects included: (a) non-English speaking adults, (b) persons not clinically diagnosed with COPD, (c) a known cognitive impairment, (d) persons not residing in east-central IN/ west-central OH areas.

After advertisement began, subjects who desired to complete the survey were given an informed consent letter describing the project and an envelope with the survey enclosed. The informed consent assured participation was voluntary and they had the right to refuse or withdraw at any time. Subjects who agreed to participate filled-out the survey and placed it in a sealed envelope or a lock-box on site. Sealed envelopes were collected on-site by the primary investigator (PI). Lock-box surveys were collected by the PI every other business day.

Project recruitment lasting for three months yielded 70 participants who completed surveys. Sample demographics collected were comparable to the pre-assessment data provided by RHHCS for age, gender, and county of residence. While the total number of surveys collected was 70, some participants chose to leave certain questions blank. When dichotomizing and calculating the total of each category, the blank responses were not included in the total.

Measures

Measures of assessment were completed in a two-step process: pre-assessment and assessment.

Pre-assessment

The pre-assessment was to learn demographics of the current rural COPD population so they could be compared to the demographics of the surveyed population for comparability. Demographic data was retrieved for all patients receiving services at RHHCS for COPD (ICD-9

codes 490-491, 494, 496) in the fourth quarter of 2013 (October, November, December), including age, gender, and place of residence. The pre-assessment data disclosed there were 1235 (N = 1,235) patients seen for COPD at RHHCS during that time. Of those patients, 55% (n = 676) were females and 45% (n = 559) were males. The largest age percentage of age groups were between 60-69 years old 26% (n = 317) and 70-79 years old 25% (n = 313). Seventy-four percent (n = 910) of the patients resided in Wayne County, IN, 5% (n = 74) resided in Fayette Co. IN; 10% (n = 124) resided in Union Co. and Randolph Co., IN; and 10.5% (n = 127) resided in Preble Co. and Darke Co., OH.

Assessment

The assessment included surveying the COPD participants from October 1st thru December 31st of 2014.

Tool. A 30-item assessment survey was used. The survey was constructed using three evidenced-based assessment tools: the Community Assessment Risk Screen (CARS), the Hospital Admission Risk Prediction (HARP) tool, and the Patient-Centered COPD Questionnaire. The CARS instrument is a screening tool used to identify elderly persons at risk for hospitalization or emergency room visits; Receiver Operating Characteristic (ROC) curve risk classification 0.74, the alpha $p = .05$ (Shelton et al., 2000). The HARP tool assists health care providers to identify patients who are at risk of future hospitalizations and increased users of health system resources (CIHI, 2013); 95% Confidence Interval: 0.57 – 0.77 (Beaton & Grimmer, 2013). The Patient-Centered COPD Questionnaire is a COPD specific instrument used to measure patient's perceived impact of COPD on daily life; Chronbach's alpha 0.93 - 0.74. (Pommer et al., 2013).

Readability for the survey was set at the sixth-grade level (My Byline Media, 2014). No identifying information was included on the survey. Survey questions one to fifteen were demographic style questions. Questions 16 - 30 were arranged on a five-point Likert scale with 1 indicating *never* and 5 indicating *always*.

Survey questions assessed for resource availability, relative risk, and health status. Resource availability was comprised of socioeconomic and environmental resources. Socioeconomic resources included questions that assessed education level, marital status, living arrangement, and employment status. A score range of zero out of four was possible for socioeconomic resources. Environmental resources included questions that assessed health program availability, health program enrollment, quality of COPD management, satisfaction of COPD management, access to health care for shortness of breath (SOB), friends available to assist with SOB, and transportation availability to medical appointments. A score range of zero out of seven was possible for environmental resources. The total resource availability score included the sum of socioeconomic and environmental resources. A score range of zero out of 11 was possible for total resource availability. Relative risk questions included age, gender, race, County of residence, smoking habits, COPD knowledge, COPD support needed, increased sadness, and access to medical attention for SOB. A total score range of zero out of nine was possible for relative risk. Health status questions included co-morbidities, number of hospital admissions and doctor visits in the past year, possible ER visits in past six months, number of daily prescriptions used, and number of daily over-the-counter medications used. A score range of zero out of nine was possible for health status.

Analysis. Data analysis was done using SPSS version 21 for descriptive statistics. Percentage

frequencies were recorded as well as totaled and calculated for the mean (M) and standard deviation (SD) (Lipsey, 1990). Likert questions results were dichotomized into two main groups 1) Never/A little (1, 2) and 2) Often/A lot/Always (3, 4, 5) for reporting of frequencies (Statistics Café, 2011). To prevent skewing the mean for these results, questions with an answer of *no response* were omitted from the total (N). Socioeconomic resources n = 65 indicates 5 of the 70 subjects had no response. Comparisons were completed using the t-test for statistical significance. $P \leq .05$ was considered significant.

Results

Of the survey sample, 64% (n = 45) of the sample was greater than 65 years old, 51% (n = 35) were female, 61% (n = 43) lived in Wayne Co, IN; 3% (n = 2) lived in Fayette Co, IN; and 36% (n = 25) lived in the surrounding rural counties. The sample surveyed for the project during October, November, and December of 2014 was comparable to the population of COPD patients seen at RHHCS during October, November, and December of 2013.

Resource availability

The possible range of total resource ability score was zero to 11. The sample range of total resource availability was three to 11. The resource availability mean was 7.06, SD 1.88 (n = 54). The mean score was in the higher end of the zero to 11 ranges indicating there is a moderate level of resource availability.

Socioeconomic resource availability. The possible range of socioeconomic resource availability scores was zero to four. The sample range of scores was zero to four. Socioeconomic resource mean was 1.92, SD 1.04, (n = 65). The mean was in the slightly below the midpoint of the zero to four range indicating there is a moderate level of socioeconomic

resource availability. The highest frequency for socioeconomic resources was an educational level of a high school diploma or higher level of education. Next highest frequencies were having someone that helped with their care and being married or living with someone. Employment was only 9% or six out of the 70 participants.

Environmental resource availability. Results for environmental resource availability are depicted in Table 1. The possible range of environmental resource availability scores was zero to seven. The sample range of scores was one to seven. The mean score was 5.12, SD 1.30 (n = 58). The mean score was in the higher end of zero to seven ranges indicating a high level of environmental resources. The highest frequency for environmental resource availability was having transportation to medical appointments (car, shuttle, bus, friend, etc.) at 90%. Second highest was having friends who help with SOB episodes. Further results demonstrated 79% of participants felt they get good COPD care management. The lowest environmental resources were having health program options (37%) and being enrolled in a program (30%).

Table 1

Environmental resources

Environmental resources (n = 58)	n	%
Transportation to medical appointments		
Often/a lot/ always	63	90
Never/ a little	3	4
Have friends to help with shortness of breath		
Yes	60	86
No	6	9
Good COPD care management		
Often/a lot/ always	55	79
Never/ a little	10	14
Satisfied with COPD care management		
Often/a lot/ always	54	77

Never/ a little	11	16
Access to healthcare when short of breath		
Often/a lot/ always	54	77
Never/ a little	10	14
Have options to join health programs		
Often/a lot/ always	26	37
Never/ a little	54	77
Have enrolled to health programs		
Often/a lot/ always	21	30
Never/ a little	47	68

Risks

Results for relative risk are depicted in Table 2. The possible range of relative risk scores was zero to nine. The sample range of scores was two to seven. The mean score was 4.16, SD 1.25 (n = 50). The mean score was in the middle of the zero to nine range indicating there is a moderate level of risk. The highest frequency for relative risk was age 65 years or older. Other high scores were being a smoker and increased sadness with having COPD. For example, thrty-nine percent of COPD patients continue to smoke. At the low end of relative risk were need

Table 2

Relative risks

Relative risks (n=50)	n	%
Age		
Less than 45 years old	2	3
45-54 years old	9	13
55-64 years old	13	19
65-74 years old	30	43
75-84 years old	10	14
Greater than 85 years old	5	7
Gender		
Male	34	49
Female	35	50
Smoke		
Yes	27	39

Relative risks (n=50)	n	%
No	43	61
Increased sadness		
Often/a lot/ always	23	33
Never/ a little	40	57
County of residence		
Wayne County, Indiana	42	60
Fayette County, Indiana	2	3
Randolph County, Indiana	6	9
Union County, Indiana	4	6
Darke County, Ohio	1	1
Preble County, Ohio	12	17
Need more COPD support		
Often/a lot/ always	18	26
Never/ a little	50	72
Know what having COPD means		
Often/a lot/ always	54	77
Never/ a little	14	20
Do not seek medical attention for shortness of breath episodes because		
No doctor	0	0
Cannot afford it	1	1
No transportation	1	1
Use home remedy	5	7
Two or more of the above	25	36
	21	30
Race		
Caucasian	65	93
African American	2	3
Hispanic	1	1
American Indian	1	1

more support from COPD care provider, do not know what having COPD means, and do not seek medical attention for SOB.

Table 3

Health status

Health status (n = 64)	n	%
Able to complete Activities of Daily Living		
Often/a lot/ always	45	89
Never/ a little	7	10
Visits to doctor in the past year		

Health status (n = 64)	n	%
3 or more	55	79
0 - 2	11	16
Know how to handle shortness of breath episode		
Often/a lot/ always	55	78
Never/ a little	10	14
Seek health care when short of breath		
Often/a lot/ always	54	77
Never/ a little	10	14
Daily prescriptions		
5 or greater	52	74
0 - 4	10	14
Co-morbidities		
1 or more	46	66
None	24	34
Experience shortness of breath		
Often/a lot/ always	45	64
Never/ a little	21	34
Hospital admissions in past year		
1 or more	37	53
0	32	46
Visited the emergency room in past 6 months		
Yes	36	51
No	34	49

Health status

Results for health status are depicted in Table 3. The possible range of health status scores was zero to nine. The sample range of scores was three to nine. The health status mean was 5.35, SD 1.60, (n = 64). The mean score was in the slightly above the middle of the zero to nine range indicating that the health status of the participants were in the moderate level. The highest frequency reported for health status was completing ADLs. Further results show high scores for visits to the doctor, five or more daily prescriptions, and know how to control breathing when short of breath. Additionally high scores were calculated for experience shortness of breath, seek health care when short of breath, and admitted to the hospital.

T-tests demonstrated statistical significance for COPD patients with one or more co-morbidities as more likely to have one or more hospital admissions per year (n=17, M2.5 +/- 0.9, p = 0.03) and use five or more prescriptions daily (n=36, M=5.61, SD+/- 0.99, p = 0.005). Statistical significance was also seen for participants who reported having one or more hospital admission and completing ADLs *a little/ never* (n=33, M4.67, SD +/- 0.1.21, p = 0.007). Results demonstrated participants who reported increased sadness (p=0.22). Participants with no hospital admissions reported more often they did not have a friend help them with SOB episodes (n=33, M 1.83, SD 0.28, p = 0.05). Participants living in rural counties surrounding Wayne Co were more likely to use a home remedy and not seek medical attention for a SOB episode (n=41, M 5.0, SD +/- 1.25, p =0.02).

Discussion

While the sample size was only 7% of the target COPD population, the sample demographic statistics were comparable to the actual COPD population for age, gender, and place of residence. This supports the sample as representative of the COPD population.

COPD patients had a high level of resource availability, with greater levels of environmental resources than socioeconomic resources. The majority of participants had graduated from high school and over half the participants had someone to assist with their care. Half of participants were married, meaning their caregiver lived within the home. A large majority of the sample was retired or unemployed. The vast majority of COPD patients had transportation to medical appointments and had friends to assistance them when short of breath. The majority of participants utilizing RHHCS services reported they received good COPD care and were satisfied with their care.

Notably, less than half the sample reported having health program options and only one-third reported being enrolled in a program. With a perceived lack of health program options and only one-third of the population being enrolled in current health promotion programs, additional assessments should be conducted to determine what health programs are available, if the programs are accessible to patients in terms of location, time, and insurance reimbursement, and what the current recruitment process is.

There was a moderate amount of relative risk for the sample. The majority of participants were greater than 65 years old and one-third reported increased sadness with having COPD. Interventions need to be developed for patients 65 years or older that are geriatric friendly. In terms of participants with increased sadness, a depression screening tool such as the Beck's Depression Inventory conducted in the medical provider's office or by case managers would be useful to determine if a patient is suffering from depression. Collaboration with the patient's primary care providers would be beneficial for additional insight. COPD support groups for dealing with the disease would provide mental health support. Social networking possibilities may be a viable option. In 2014, social networking usage among internet users 65 years and older rose to 59% (Smith, 2014). Collaboration with mental health clinicians may be necessary depending on the depression screen results.

An important consideration in relative risk category is 39% of participants reported they smoke. Smoking cessation is the single most important intervention for slowing the progression of COPD (National Committee for Quality Assurance, 2009). Each patient should be assessed for smoking at every visit (Agency for Healthcare Research and Quality, 2012). Providers should communicate a strong, clear anti-smoking message for smokers to quit. Fewer than half

of providers regularly screen their patients for smoking (Kulig, 2005). Smokers should be flagged in their medical record for the providers. Smokers should be educated concerning smoking cessation barriers. Common barriers include: patient misinformation, levels of motivation, health beliefs, and poor communication with medical professionals.

Selecting an appropriate smoking cessation program is important. The program should be one that will appeal to the age and the needs of the patient. Patients can be evaluated for one's readiness using the Stages of Change Theory (Prochaska & DiClemente, 1983). The model identifies five stages of change: precontemplation, contemplation, preparation, action, and maintenance. Individualized smoking cessation strategies can be developed based on the stage the patient is in. For example, most smokers who fall in the preparation stage are ready to quit and fully intend to do so. The health care provider should explore and formulate realistic options with them, encouraging the smoker to select a specific quit date in the near future (Huber & Mahajan, 2008). Research by Coronini-Cronberg, Heffernan, and Robinson(2011) demonstrated obtaining an annual spirometry measurement with a brief smoking cessation intervention, followed by a personal letter from the medical provider had a higher year abstinence rate among COPD patients (Coronini-Cronberg, et al., 2011). Smokers who have a long history of smoking should be considered for nicotine therapy replacement (NRT), behavioral therapy, and depression screening as smokers report higher levels of depression (Thomas, Supiano, Chasco, McGowan & Beer, 2009). *Ask-Assess-Assist-Advise-Arrange* is a smoking cessation approach supported by the National Cancer Institute. The process involves: asking and documenting if the patient uses tobacco at every visit; strongly advising against smoking and urging every tobacco user to quit; assessing if the patient is willing to make an attempt to quit; assisting the willing

patient in the quit attempt by initiating NRT and behavior counseling; and arranging for a follow-up contact in person or by phone within the first week after the quit date (Agency for Healthcare Research and Quality, 2012).

Thirty-three percent (33%) of the sample reported they live in a solely rural area. Twenty-six percent reported they need more support for their COPD and 10% reported they do not get medical attention during an SOB episode due to lack of provider, transportation, or finances. Continuity and coordination of care can be a difficult challenge for increased rural areas (Bellamy et al., 2011). Further assessments are necessary to determine what type of COPD care support patients need and how to solve the lack of access to medical attention for SOB. Self-management interventions could be practical in this setting. The most effective self-management plans combine pharmacological management, remote monitoring by telephone or telemonitor, and an individualized plan that includes educational strategies of self-regulation, self-care, and managing the barriers to self-care (Bourbeau & Nault, 2007; Bourbeau & Saad, 2013).

This sample was moderately healthy. For example, the majority of the sample reported they could regularly complete their ADLs (89%) and knew how to handle their SOB episodes (78%). Congruent with current research (Shelton et al., 2000) the sample's indicators of decreased health status are: the majority visited their doctor greater than twice per year (78.5%), take five or more prescriptions daily (74%), have two or more comorbidities (66%) and often feel short of breath (64%). At least half of the sample reported visiting the ER in the past six months (51%) and had at least one hospitalization in the past year (52.9%). Consequently only a small portion (17%) does not seek health care when SOB. Research supports the strongest predictors of increased use of hospital services are history of ER visits and hospitalization, co-

morbidities, and five or more daily prescriptions (CIHI, 2013). Health status results appear to be the strongest indicator for developing an action plan and early intervention program. Given the statistical significance that participants living in rural counties surrounding Wayne Co were more likely to use a home remedy and not seek medical attention for a SOB episode, a self-management program is recommended to allow for regular assessment of patients' mental and physical status. This would include collaboration of the patient, caregiver, and health care providers to implement strategies to relieve the SOB and keep the patient in the home longer. Self-management programs have been shown to support chronically ill patients and their caregivers, improve patient outcome and prevent hospitalization (Muenchberger & Kendall, (2010). There are different self-management program models. For example, *Living well with COPD program* is a self-management program that consists of patient and caregiver education, health promotion interventions, and regular follow-ups to support the patient in managing their at home (Bourbeau & Van Der Palen, 2009). Further assessments are needed to determine which self-management program would be effective for this population. The program should include a combination of direct communication using home visits, telephone, and telehealth (Bourbeau & Van Der Palen, 2009).

Post Assessment Activities

Given that there are a significant number of patients diagnosed who COPD who are smokers, smoking cessation screening and programs should be implemented into the care program in order to address this health issue. There are also a significant number of patients with increased sadness. Depression screening is recommended to identify the number of COPD patients who need mental health support. Health care providers and support staff should evaluate

their treatment methods in order to address this issue. Perhaps patients would not want to continue treatment because of the negative influence on their lives. Stakeholders need to know that patients reported they need more support for their COPD. Further assessment should be conducted to determine what type of COPD care support is needed. COPD providers should address the need for self-management with an education platform to educate the patient on their disease. A working collaboration between primary care providers, specialty providers, case managers, and other medical support is needed to address the priority needs of COPD patients. This will work to provide better service and address relative risk challenges for patients. Moreover, additional assessments to determine specific patient gaps related to access to care are needed.

Limitations

Project limitations include a small and homogenous sample size, therefore, the project results are not generalizable to other populations with COPD. Regarding representation, participants willing to fill out the survey may have been in better health and more likely to participate in their health care. For example, 23% of the participants were recruited from pulmonary rehabilitation services. Furthermore, some participants may not have be willing to share personal information for fear of lack of anonymity.

Implications

When comparing the scores, the results demonstrate a high to moderate amount of resource availability and a moderate amount of relative risk and health status. These considerations are important when planning future care for this population (Lemmens, Nieboer, & Huijsman, 2008). For example, the participants' education level and social support are factors to consider when

implementing smoking cessation which may include a caregiver's support. Caregiver assistance and transportation would be useful when enrolling a COPD patient in a health promotion program such as pulmonary rehabilitation. Risks are also important when considering interventions, increased sadness and more COPD support needed warrants further study to determine the level of sadness and support needed.

Research (Henry, Man, & Fung, 2013) has been conducted concerning the effectiveness of nurse-led COPD management programs to improve health outcomes and prevent re-hospitalizations. Successful programs were ones who utilized a primary APN assigned to the COPD patient. The APN maintained weekly communication, made bi-weekly home visits and maintained regular collaboration with the primary care provider or specialist to adjust the treatment plan as needed (Long, 2012). Utilizing the project findings, these early interventions can be instituted to promote health outcomes.

Conclusion

COPD is complex and incurable, yet it is manageable (Rasekaba, Williams, & Hsu-Hage, 2009). A needs assessment is an effective tool to use as a basis for developing effective early interventions targeted at improving health outcomes of COPD patients (Issel, 2014). Stakeholders such as physicians, nurses, COPD support services, and significant others should be included when establishing goals and action plans.

Qualitative research is warranted to understand what support is needed and why COPD patients are still smoking. Further assessment is needed to examine what additional health promotion interventions would be successful with this population. For example, investigating if telemedicine be useful with this population.

Though findings from this project are limited, the information helps build the program and lay a foundation for further assessments to be conducted with larger sample sizes in different rural areas with intent to assess needs, identify resources, relative risk, and health status to support the development of interventions targeted at improving a rural COPD population's health outcomes.

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