Chronic Obstructive Pulmonary Disease: A Study to Analyze COPD Care Practices in the United States

By

Sumeera Sra

Dissertation submitted in partial fulfillment of the requirements of the degree

MBA Hospital and Health Management

Academic year, 2018-2020

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DRG
Part of Clarivate

June 25, 2020

To Whom It May Concern

Sumeera Sra

Emp Code – 102450

This is to certify that Sumeera Sra has completed her dissertation project "Chronic Obstructive Pulmonary Disease: A Study to analyze COPD Care Practices in the United States" with DRG Analytics and Insights Private Limited from 18th February 2020 to 18th May 2020.

We wish her all the best for her future endeavors.

Yours Sincerely,

Megha Maheshwari

Manager, MedTech and Provider Insights

ABSTRACT

Introduction: COPD is one the leading causes of death in the US and every year billions of dollars are spent on patient care for COPD. It is projected that the costs associated with COPD patient care will rise to around $49 billion in 2020. In addition to the economic burden, the social burden associated with COPD cannot be ignored. According to a Global Burden of Disease study COPD is the second leading cause of Disability Adjusted Life Years (DALYs) lost after ischemic heart disease.

Objectives: The objectives of the study are as follows: 1) To study the prevalence of COPD in United States. 2)To identify the barriers to optimal care of COPD patients. 3)To study the best practices adopted by hospitals in United States for reducing COPD related readmissions.

Methodology: Study design: Descriptive observational study; Duration of study: 3 months; Data Collection Tool: Research studies, posters, journal articles, surveys; Data analysis: To analyze the prevalence of COPD secondary data was obtained from Behavioral Risk Factor Surveillance System (BRFSS) and analyzed using MS-excel. To analyze the barriers to optimal care of COPD patient's literature review of 5 research studies and articles based on care delivery in United States was conducted. To analyze the best practices adopted by organizations a thorough review of studies was done, the interventions and outcomes of the programs and strategies were summarized tabular form.

Inclusion Criteria: Studies published between 2016 to 2020, based out of United States

Exclusion Criteria: Studies published before 2016 and not based out of United States

Findings: The prevalence of COPD in United States is 6.4%. The major barriers to care of COPD patients include lack of patient education, improper follow-up visits schedule, lack of standardized guidelines, noncompliance to medications, lack of discharge planning guidelines. Best practices to reduce COPD readmissions are developing care bundles, adopting chronic care model, adopting multidisciplinary team approach, developing discharge plan of care for copd, employing patient

care navigators, telehealth pulmonary rehabilitation program, copd exacerbation clinic and care coordinators.

Conclusion: According to the BRFSS survey the prevalence of COPD is 6.4% with West Virginia being the state with highest prevalence of COPD. Being chronic in nature COPD requires multidisciplinary care by team of professionals consisting of physicians, pulmonologists, respiratory therapist, and nurses. Adopting strategies such as standardizing workflows and treatment protocols, adopting care bundle approach, can significantly contribute in reducing the readmission rates. Transition from hospital to home is one of the major challenges faced by the patients. Patient navigator's system, rehabilitation programs, telehealth programs, post discharge follow-up visits and patient education can play an important role in reducing complications after discharge from the hospital.

ACKNOWLEDGEMENT

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ORGANIZATION PROFILE

Decision Resources Group started with the vision to provide guidance to healthcare organizations with the data and guidance in order to bring life-changing therapies to more patients around the world. in February 2020, Decision Resources Group was acquired by Clarivate . DRG has 17 offices across six countries.

DRG is the premier provider of healthcare analytics, data and insight products and services to the world's leading pharma, biotech and medical technology companies. Consulting team provides guidance, support, and solutions at every phase of product development to the biopharmaceutical and medical technology companies.

Healthcare Business Insights, now a Part of Clarivate is a best-practice research company serving 1900+ hospitals and healthcare systems throughout United States. It provides thorough insights based on best practices from the nation's leading hospitals and healthcare systems. Consists of 3 academies:

Cost & Quality Academy: Provides Proven for improving quality outcomes at lowered costs. It majorly covers topics under Population and Disease Management, Patient Care Experience and Patient Care Delivery.

Revenue Cycle Academy: Provides solutions to improve revenue cycle performance and patient satisfaction. It majorly covers topics under patient access, documentation charge capture and coding, strategic revenue management and billing & collections.

Supply Chain Academy: Conducts research and analysis that lead to cost savings and clinical improvements. It majorly covers topics under covers topics under strategic management, value management and operations & category management.

ABBREVIATIONS

- COPD: Chronic obstructive pulmonary disease
- CDC: Centers for Disease Control and Prevention
- DALYs: Disability Adjusted Life Years
- ED: Emergency Department
- BRFSS: Behavioral Risk Factor Surveillance System
- DIPLAC: Discharge Plan of Care for COPD
- CCMP: Comprehensive Care Management Program
- GOLD: Global Initiative for Chronic Obstructive Lung Disease

CONTENTS

INTRODUCTION

Chronic obstructive pulmonary disease abbreviated as COPD is defined by the Centers for Disease Control and Prevention as "a group of diseases that cause airflow blockage and breathing-related problems. It includes emphysema and chronic bronchitis".

About 16 million people in the Unites States are suffering from this disease. In addition to this a large section of population remains undiagnosed. COPD is one the leading causes of death in the US and every year billions of dollars are spent on patient care for COPD. It is projected that the costs associated with COPD patient care will rise to around $49 billion in 2020.

In addition to the economic burden, the social burden associated with COPD cannot be ignored. According to a Global Burden of Disease study COPD is the second leading cause of Disability Adjusted Life Years (DALYs) lost after ischemic heart disease.

The most common symptoms of COPD are chronic cough, dyspnea, respiratory infections, cyanosis, fatigue, wheezing, excess phlegm, mucus, or sputum production. According to *American Lung Association,* one of the major risk factors associated with COPD is smoking. Other risk factors include air pollution, passive smoking, genetic condition (Alpha-1 deficiency), and exposure to chemicals, dust.

COPD National Action by Department of Health and Human Services highlights 5 main goals to address this chronic disease. These goals are summarized below.

The first goal is to increase the awareness about COPD in the community through outreach programs and make the community aware about the various risk factors. The major focus of this goal is to increase the early detection of the disease and empower the community to fight against this chronic disease.

The second goal is to improve the way care is delivered to the patients suffering from COPD. It focuses on standardizing the care plans for diagnosis and treatment and adopting newer technology to improve the current practices.

The third goal is to promote data collection at all levels that can aid to make informed decisions. Focus lies creating standardized system to increase data collection and improve the care delivery to the COPD patients.

The fourth goal is to focus on research to identify the risk factors and progression of the disease. Promoting research can help to identify the different stages of disease progression and help to improve the protocols for diagnosis and treatment.

The fifth goal is to convert the recommendations of the national action plan to actionable policies. It focuses on improving funding for the various initiative by the plan through support of federal authorities.

LITERATURE REVIEW

COPD burden is much higher in the rural parts of United States when compared to the urban areas. The age-adjusted prevalence, Medicare hospitalizations and number of deaths attributing to COPD are much higher in the rural areas. This can be traced to the fact that rural population has higher prevalence of smoking and much lesser access to the smoking cessation programs and other educational programs. The other factors such as lower socio-economic status, limited access to diagnosis and treatment, more exposure to toxic substances further account to the higher prevalence among the rural population. (Croft, JB. 2018).

A study conducted to identify patients at higher risk for readmissions due to COPD states that 30-day readmissions attributing to COPD have association with factors such as age and insurance status of the patients. The study results indicate that readmission rates are higher among younger patients (lesser than 65 years) than among Patients more than 65 years of age. In addition, the insurance status of the patients also impacts the readmission rate. According to the study results, patients under 65 years of age with public insurance have higher readmission rates than patients with private insurance. (Simmering, J. 2016).

A 2017 study found that 82.2% of the COPD patients who present to the emergency department with some clinical complaint were readmitted to the ED within 30 days of discharge. Authors suggest that integrating decision support algorithms, increasing follow-up after discharge, integrating alternative management strategies can help to reduce the readmissions to the emergency department within first 30-days of discharge. (Rezaee, M. 2018).

RATIONALE

COPD is the third leading cause of mortality in United States and every year billions of dollars are spent on patient care for COPD. Hospital Readmissions Reduction Program introduced by Centers for Medicare and Medicaid Services imposes penalties on hospitals with excess readmissions due to COPD.

OBJECTIVES

- To study the prevalence of COPD in United States
- To identify the barriers to optimal care of COPD patients
- To study the best practices adopted by hospitals in United States for reducing COPD related readmissions

METHODOLOGY

Study design: Descriptive observational study

Data collection: Secondary research

Duration of study: 3 months (18th Feb 2020 to 18th May 2020)

Data Collection Tool: Research studies, posters, journal articles, surveys

Data analysis:

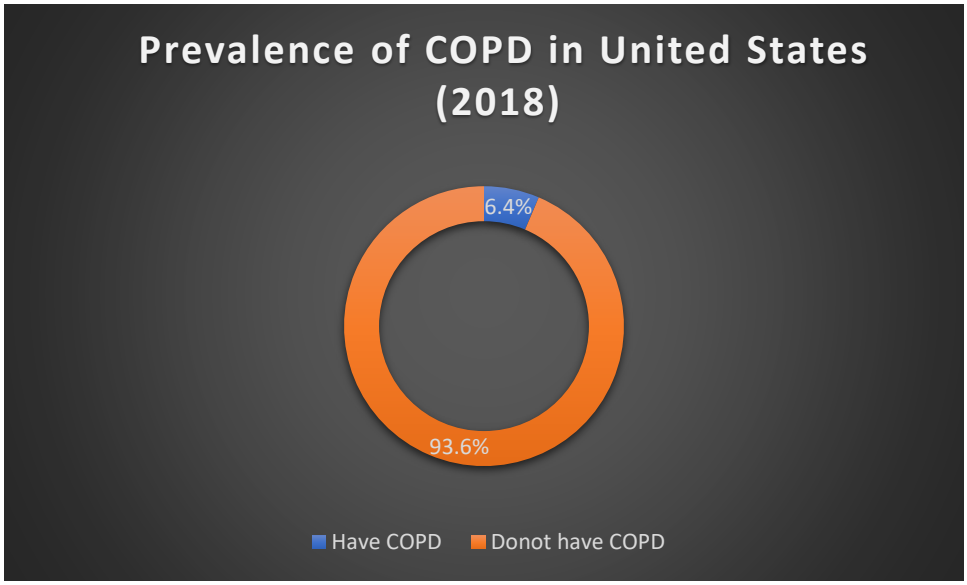
- To analyze the prevalence of COPD secondary data was obtained from Behavioral Risk Factor Surveillance System (BRFSS) and analyzed using MS-excel. National and state-wise prevalence of COPD was analyzed.
- To analyze the barriers to optimal care of COPD patient's literature review of 5 research studies and articles based on care delivery in United States was conducted. The findings were presented in tabular form.
- To analyze the best practices adopted by organizations, 10 healthcare organizations who have implemented COPD readmission reduction programs were selected. After conducting a thorough review of studies, the interventions and outcomes of the programs and strategies were summarized tabular form.

Inclusion Criteria: Studies published between 2016 to 2020, based out of United States.

Exclusion Criteria: Studies published before 2016 and not based out of United States.

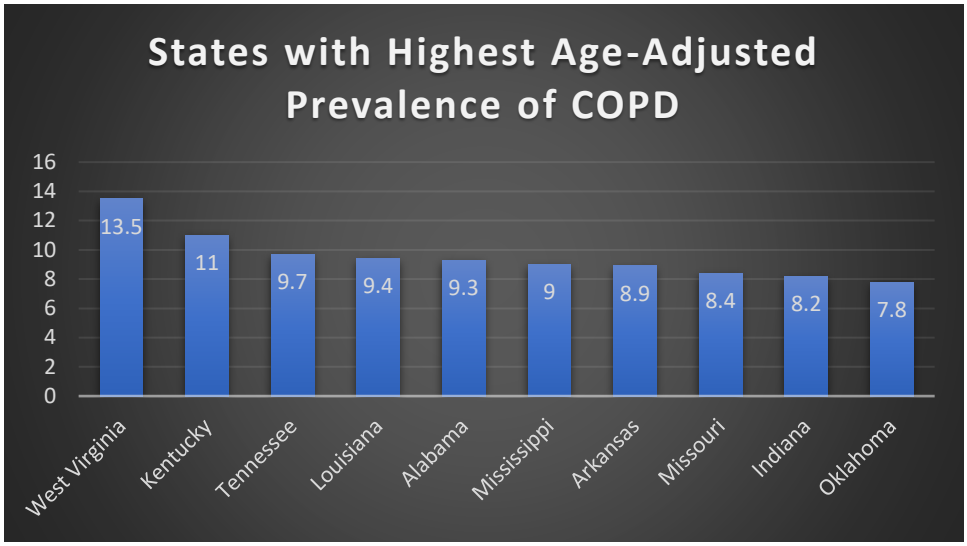
FINDINGS:

A. PREVALENCE OF COPD IN UNITED STATES



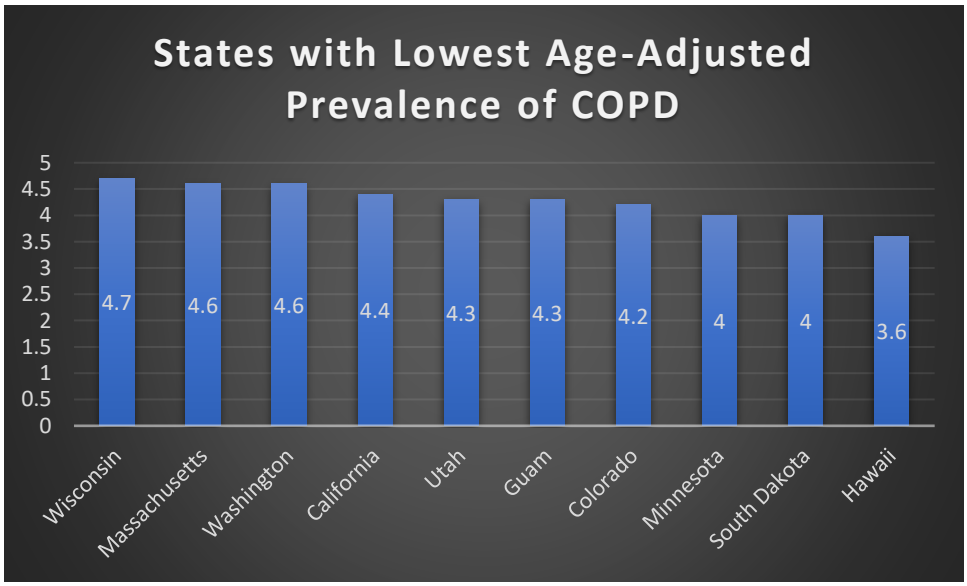
According to the 2018 BRFSS survey, the prevalence of COPD in United States is 6.4%

States with Highest Prevalence of COPD



West Virginia has the highest prevalence of COPD (13.5 %)

States with Lowest Prevalence of COPD



Hawaii has the lowest prevalence of COPD (3.6%)

B. BARRIERS IN OPTIMAL CARE OF COPD PATIENTS

The findings from the studies and articles are summarized in the table:

YEAR	AUTHOR	FINDINGS
2018	Press, VG et al.,	Barriers that hinder optimal care include lack of patient education, lack of discharge guidelines, lack of patient and family engagement, inadequate follow-up visits, lack of standardized diagnostic and treatment guidelines, lack of access to pulmonary rehabilitation.
2018	Bocharnikov, A et al.,	Study suggests that noncompliance to medication, inadequate support for smoking cessation, lack to access to pulmonologist are reasons that can impact care delivery in COPD patients.
2018	Sethi, S	The challenges include lack of standardized guidelines, noncompliance of patients to treatment guidelines, improper diagnosis of COPD exacerbation symptoms
2016	Han, MK et al.,	Unavailability of written protocols, inadequate access to pulmonary rehabilitation, lack of patient education, lack of medication adherence, lack of standardized COPD guidelines, lack of access to specialist care such as pulmonologist, unaffordable drugs can impact care delivery.
2016	Willard, KS et al.,	Barriers include lack of care coordination, improper transitions, lack of patient education, lack of rehabilitation services, improper follow-up visits.

C. PRACTICES ADOPTED BY HOSPITALS TO REDUCE READMISSION RATES:

Readmissions have always been a major concern for the healthcare organizations. With Centers for Medicare and Medicaid Services imposing penalties for readmissions, healthcare organizations across United States are continuously working on reducing the readmissions rates by adopting innovative strategies. Many hospitals in United States have been successful in reducing readmissions by making workflow modification, coordinating discharge processes, improving system for transition between hospital and home, adopting bundle care approach and few more. Some of the strategies adopted by the healthcare organizations who have been successfully reduced COPD readmission rates are summarized below.

SUMMARY OF THE STUDIES:

The table consists of practices adopted by ten healthcare organizations in the United States to reduce readmission rates attributing to COPD. All the studies are published between 2016 to 2020. These table summarizes the key intervention adopted by the organization and the outcome post the implementation of the program or strategy.

Practices adopted by U.S Hospitals in reducing COPD related readmissions

Year	Author	Organization	Study Population	Intervention	Outcome
2019	Spinella, AJ	Unity Point-Methodist Hospital	Retrospective data of patients admitted with diagnosis of COPD	Adopted nurse navigator approach in which nurses kept a check on patient progress, educated patients on inhaler techniques, scheduled follow-up visits and coordinated with the case managers	The 30-day re-admission rate reduced from 14.5% to 7.7%.

				regarding medication regimen of the patient.	
2019	Bhatt, SP et al.,	University of Alabama at Birmingham	Patients who were admitted with acute exacerbation of chronic obstructive pulmonary disease	Implemented a video telehealth pulmonary rehabilitation program which consisted of 36 exercise sessions for 12 weeks as well as educational sessions on smoking cessation, appropriate inhaler techniques.	The readmission rates for patients enrolled for the program were much lesser (3.8%) in contrast to other patients (11.9%).
2019	Elfessi, Z et al.,	Jesse Brown VA Medical Center	Patients with diagnosis of acute exacerbation of chronic obstructive pulmonary disease	Implemented Discharge Plan of Care for COPD (DIPLAC) which includes providing written COPD-specific action plan, medications for emergency use, instructive videos, outpatient clinic appointment within 48 hours.	Reduction in return visits for Acute Exacerbations of COPD was observed among the patients that were enrolled for the plan
2018	Wynn, N et al.,	University of Miami Hospital	Patients coming to the emergency department with diagnosis of COPD	Implemented a multidisciplinary team approach in which the team is alerted whenever a patient with diagnosis of COPD visits the ED.	Readmission rate reduced from 21% to 19% over a 12-month period.
2018	Waddell, D et al.,	Baptist Health	Patients admitted with diagnosis of COPD	Adopted a multidisciplinary approach which included counselling on smoking cessation, teaching proper inhaler	Readmission rate reduced from16.8% to 13.6%.

				technique, patient education and adoption of new treatment protocol.	
2018	Euceda, G et al.,	Danbury Hospital Connecticut	Patients with a diagnosis of acute exacerbation of chronic obstructive pulmonary disease	Adopted a comprehensive care management program (CCMP) which allowed smooth transition between hospital and home. Patient care navigators were appointed who followed up patients after discharge and addressed their queries regarding medications and any other issues the patients were facing.	Post implementation of the program the readmission rates reduced from 21.6% to 13.6% over a period of one year.
2017	Muhammad, AZ et al.,	University of Cincinnati Medical Center	Patients with diagnosis of COPD who were readmitted to the hospital	A multidisciplinary team created COPD care bundles which consisted of five main components majorly focused on inhaler regimen and follow up visits.	The readmission rate decreased from 22.7% to 14.7%.

2017	Agee, J	St. Joseph Regional Medical Center, Idaho	Patients above 18 years with COPD diagnosis	Adopted a chronic care model which includes components such as delivery system design, clinical practice guidelines, clinical information systems like patient registry and methods to track patient progress.	Post the implementation of this quality improvement project, the organization observed a marked reduction of 46.03% in COPPD readmissions.
2017	Russo, AN et al.,	Cleveland Clinic Main Campus Hospital	Patients who have been hospitalized 2.8 to 3.0 (average) times, with 3 to 3.1 times physician care visits and had visited pulmonary out-patients visits 1.7 to 2.4 times	Two interventions were put into place- First being the setup of COPD exacerbation clinic and the second being the employing care coordinators. The exacerbation clinic included conducted physical examination and patient counselling after one week of discharge. The care coordinator weekly contacted the patients after 30-days of discharge.	The 90-day readmission rate for patients visiting exacerbation clinic was 35.8%, 50% for care coordinator group and 41.2% for patients enrolling for both interventions. For patients receiving none of the two interventions the 90-day readmission rate was 80.8%.
2016	Parikh, R et al.,	Rush University Medical Center	COPD exacerbation patients admitted in the hospital	Developed care bundles for treating COPD exacerbation cases. The care bundles were formed by a multidisciplinary team of experts taking into consideration COPD exacerbation guidelines.	The 30-day in patients treated using COPD care bundle approach decreased was 9.1% and in patients treated without it was 54.4%.

ANALYSIS:

A. To study the prevalence of COPD in United States

According to the 2018 BRFSS survey, the prevalence of COPD in United States is 6.4%. West Virginia has the highest prevalence of COPD while Hawaii has the lowest prevalence of COPD. The prevalence of COPD in West Virginia was highest in age group (55-64) and with annual household income < $15,000. Social determinants of health such as income level, education can impact the prevalence of the disease. Some of the facts reported in West Virginia BRFSS report (2018) that can be accounted to high prevalence of COPD in West Virginia include:

- The median household income accounts to $44,097 which is much lesser than national median household income $61, 937.
- The proportion of poverty is 19.1%.
- The health status of 26.3% adults in West Virginia is considered to be fair or poor
- West Virginia has highest prevalence of poor physical and mental health in United States.
- The health status of 26.3% adults in West Virginia is considered to be fair or poor
- 19.5% adults in the state don't have personal health care provider
- 14.6% adults were not able to afford medical care in the previous year
- State has highest prevalence of cardiovascular diseases (14.6%)
- State has second highest prevalence of diabetes (15.0%)
- Second highest prevalence of tobacco use (28.4%) which is a major risk factor for COPD

B. To identify the barriers to optimal care of COPD patients

With reference to the above-mentioned studies, the following are most common barriers to optimal care for COPD patients:

- **Lack of patient education**

  As COPD is a chronic disease, patient education plays an important role in care delivery. Patients should be empowered to perform everyday activities and take active participation in decisions relating to their treatment. Developing patient education tools such as information brochures, checklists which cover topics relating to medication administration, follow-up visits, smoking cessation, treatment in case of emergency situations, pulmonary rehabilitation.

- **Improper follow-up visits schedule**

  Follow-up visits are essential to keep a track of patient's progress, manage medication regimen and keep a check on comorbidities. GOLD guidelines recommend two regimens for follow-up early i.e. within first 4 weeks of discharge and late i.e. within 12 weeks of discharge. Non-compliance to early and late follow-up visits can hampers the care delivery process.

- **Lack of standardized guidelines**

  Lack of uniform guidelines leads to improper diagnosis, thereby delaying the course of treatment. Healthcare organizations should implement standardized guidelines for diagnosis and treatment of COPD patients. CDC recommends following of GOLD guidelines for diagnosis and treatment regimens.

- **Noncompliance to medications**

  Compliance of patients to the medications is of utmost importance. Lack of compliance to the medication effects the recovery and can lead to further complications. Patients should be educated regarding the inhaler techniques and the medication regimen. Treatment regimen provided by GOLD guidelines should be followed.

- **Lack of discharge planning guidelines**

  Discharge planning is essential for smooth transition of patients from hospital to home. Personalized discharge plans should be formed by team of multidisciplinary experts consisting of pulmonologist, physicians, respiratory therapists, nurses, care navigators.

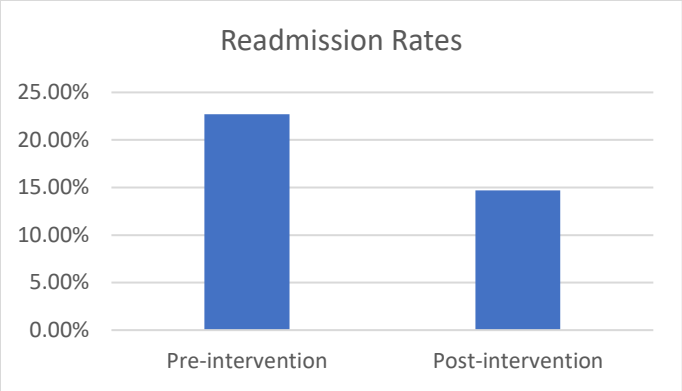
C. To study the best practices adopted by hospitals in United States for reducing COPD related readmissions

The studies were thoroughly reviewed, and the interventions adopted in the above-mentioned studies for reducing COPD related readmission rates are summarized below. These interventions have proven helpful in reducing the readmission in COPD patients. The interventions are divided into two sections─ pre-discharge and post-discharge.

I. Pre-discharge

- **Developing care bundles**

  Adopting COPD care bundles have shown to reduce the readmission rates. The University of Cincinnati Medical Center was able to reduce 30-day readmission rate from 22.7% to 14.7%.



The components of the COPD care bundle include:

- Educating patients regarding inhaler regimens
- Adopting inhaler regimen based upon GOLD guidelines
- Developing discharge instruction tool so that uniform education is provided to all patients
- Ensuring follow-up visit plan

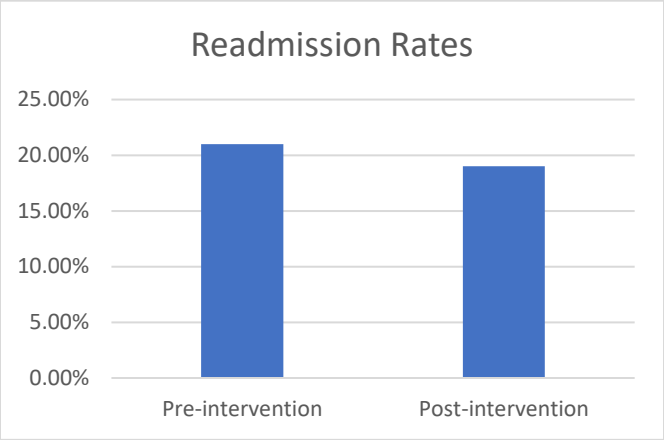
- **<u>Adopting Chronic care model</u>**

  The chronic care model comprises of various parameters with focus on standardizing the care practices. With the adoption of chronic care model, the hospital was able to reduce the readmission rate by 46.03%. The major components of the chronic care model include

  - developing clinical practice guidelines for diagnosis and treatment based upon the GOLD guidelines
  - Concentrating on patient education during the hospital stay
  - Training the healthcare providers to properly instruct patients for the use of inhalers

- **Adopting Multidisciplinary Team Approach**

  Multidisciplinary team consisting of physicians, nurses, social workers, pharmacists, respiratory therapists helps to provide care in comprehensive and efficient way. The team gets alerted when patient with a diagnosis of COPD arrives in the emergency department. By adopting the multidisciplinary team approach, the University of Miami Hospital was able to reduce readmission rate from 21% to 19% within one year.



- **Developing Discharge Plan of Care for COPD (DIPLAC)**

  The discharge plan of care focuses on streamlining the discharge process and providing uniform education to the patients. It focuses on educating the patients regarding medication administration, steps to follow in case of emergency situations, and importance of follow-up visits after discharge. The hospital successfully reduces the return visits of patients with acute exacerbation of COPD.

- **Employing Patient care navigators**

  Patient care navigators helped in transition from hospital to home. The care navigators educated the patients regarding medication administration, addressed financial and social problems faced the patients and coordinated the follow-up visits of the patients.

II. Post-discharge

- **Telehealth Pulmonary Rehabilitation Program**

  The rehabilitation program includes exercises prescribed by the physicians along with aerobic exercises and yoga over teleconferencing device given to the patients. It also focused on providing educational sessions on smoking cessation, self-management techniques were inhaler techniques to the patients.

- **COPD exacerbation clinic and Care Coordinators**

  The outpatient clinics focused on conducting follow-up visits for COPD patients after discharge. Thorough physical examination of patients is conducted in the clinic along with providing counselling.

  Care coordinators help to coordinate follow-up patients after discharge and address any other issues that are patients are dealing with. They serve as a point of contact for the patients after discharge.

CONCLUSION

In United States COPD is one of the major causes of mortality and morbidity. According to the BRFSS survey the prevalence of COPD is 6.4% with West Virginia being the state with highest prevalence of COPD. Various social factors such as lack of education, income levels, tobacco use can be accounted the high prevalence of COPD. Meanwhile states like Hawaii, South Dakota, Minnesota have the lowest prevalence of COPD.

Being chronic in nature COPD requires multidisciplinary care by team of professionals consisting of physicians, pulmonologists, respiratory therapist, and nurses. Various barriers can hinder optimal care include lack of patient education, improper follow-up visits, non-compliance to treatment and lack of care coordination. These barriers need to be addressed to improve care delivery and provide patient centered care.

High readmissions rates due to COPD is a major issue faced by healthcare organizations across the globe. With Centers for Medicare and Medicaid Services imposing penalties for high readmission rates, healthcare organizations across United States are continuously working on reducing the readmissions rates by adopting innovative strategies.

After reviewing the above-mentioned studies, we can come to a conclusion that adopting strategies such as standardizing workflows and treatment protocols, adopting care bundle approach, can significantly contribute in reducing the readmission rates. Along with this a major focus should be given on early diagnosis of the patients.

Transition from hospital to home is one of the major challenges faced by the patients. Patient navigator's system, rehabilitation programs, telehealth programs, post discharge follow-up visits and patient education can play an important role in reducing complications after discharge from the hospital.

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