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The Effect of Depression on Lehigh Valley Health Network’s Commercial and Medicare High-Risk COPD Population for Quality and Utilization Outcome Improvement

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Introduction
Approximately 17.8% of the US GDP in 2015 was spent on healthcare.1 Notably, 5% of the patient population accounts for 50% of that healthcare spending.2 There have been many initiatives set forth for reducing healthcare cost within many healthcare systems. Most healthcare groups focus on targeting the “hot-spotters” who are super utilizers;3 however, the population that cannot be taken for granted are high-risk patients, defined as those who can be predicted to over-utilize in the future. Utilization in healthcare was defined as consumption of services or supplies, such as office visits, number of prescription drugs taken, or number of days hospitalized.4 Within that subset of utilizers, about 6.4% of Americans, 15.7 million, have been diagnosed with COPD.5 COPD was the fifth leading cause of death in the United States in 2015.6 Previous studies have shown the link between depression and COPD, suggesting that individuals with chronic conditions, such as COPD, are more likely to have depression. They have also shown that depressive symptoms—including lack of sleep or fluctuating eating habits—have contributed to worsening dyspnea, increased COPD exacerbations, more frequent ED visits, and hospitalizations. This analysis aims to look at the effect depression has on the care and cost of Lehigh Valley Health Network’s (LVHN) COPD population. As part of a secondary analysis, it will also look at the effect of insurance status (e.g., commercial or Medicare on the two cohorts (e.g., COPD patients with depression and COPD patients without depression).

Problem Statement
In LVHN’s high-risk COPD population, what is the impact of depression on healthcare utilization and cost?

Methods
- A retrospective quality improvement analysis of two cohorts: LVHN’s COPD population with depression (n = 12,802) and LVHN’s COPD population without depression (n = 26,868), ages ranging from 21-106 for whom three years of data was collected (01/01/2014 - 11/30/2017).
- The two cohorts were further compared by insurance providers (e.g., commercial or Medicare on the two cohorts (e.g., COPD patients with depression and COPD patients without depression).
- The data was collected through healthcare intelligence software (e.g., Optum One) that pulled from electronic medical records and claims.
- Gained buy-in at meetings with the Senior Medical Director of Population Health and Payer Relations, the Executive Director of LVPHO, and pulmonology care management leaders.

Results
- This analysis suggested a positive correlation between depression and increased ambulatory visits, emergency visits, hospitalizations, and 30-day readmissions among patients with depression compared to those without. This was reflected in increased costs for COPD patients with depression compared to those without.
- Medicare beneficiaries had increased utilization and cost compared to the commercially insured.
- This analysis also demonstrated a difference between the risk adjustment factor (RAF) between the COPD cohort without depression (average RAF of 1.012) and the COPD cohort with depression (average RAF of 1.552), signifying about a 52% increase. As the COPD severity worsened, the RAF score increased.

Conclusions and Future Work
There is a positive correlation between depression and increased health care utilization for patients with COPD, regardless of health insurance provider. Furthermore, Medicare beneficiaries with COPD and depression are at an even higher risk for increased utilization. In the future, further investigation of potential countermeasures, such as earlier diagnosis (e.g., increased PHQ-9 screening), improved treatment of depression, and adoption of innovative techniques (e.g., telemedicine) should be done to elaborate on ways of decreasing utilization and optimizing quality outcomes for the cohort of patients with COPD and depression.

This project mainly encompasses all three pillars of SELECT. In regards to healthcare, we strived to improve utilization outcomes by targeting high-risk COPD patients and looking at the relationship between those who have depression compared to those without. As the trend detected showed increased ED visits, hospitalizations and 30-day readmission rates in those with depression, the next discussion lies in whether these patients are satisfied with their quality of care and whether their care aligns with their values. Lastly, I personally grew as a leader through my communication skills, in my ability to influence others with data, in my ability to manipulate data on multiple software programs, and learn from others who have mastered topics I have not.

References:

Acknowledgments:
Mark Wendling, M.D., Nina M. Taggart, MD, MA, FAAO, Sameera Ahmed, MS, RHIA, CHDA, Michael J Weiss MPH, and The Population Health and Payer Relations, the Executive Director of LVPHO, and pulmonology care management leaders.

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