

BACKGROUND & OBJECTIVE

- The spectrum of neuropsychiatric symptoms in Parkinson's disease psychosis (PDP) includes dementia and cognitive impairment. While studies have shown PDP magnifies the underlying burden of the disease, resulting in increased utilization, there is limited research examining incremental health care resource utilization (HCRU) burden of coexisting dementia (PDP+D) among patients with Parkinson's disease psychosis [1,2]. This study was conducted to address the current gap in literature.
- The objective of this analysis was to compare healthcare resource utilization (HCRU) outcomes in Medicare beneficiaries diagnosed with PDP-only vs. PDP+D

METHODS

Study Design & Data Source

- A retrospective cohort analysis of Parts A, B, and D claims from 100% Medicare sample of PDP patients from January 1, 2013, to December 31, 2019, was conducted.

Study Population

- Patients with incident dementia post PDP diagnosis (PDP+D) vs. PDP-only patients without incident dementia (PDP) during 01/01/14 to 12/31/18, formed the patient sample.

Exclusion Criteria

- Patients with a pre-index diagnosis of dementia, psychosis, secondary parkinsonism, delirium, other psychotic disorders, alcohol/drug-induced psychosis, schizophrenia, paranoia, or personality disorder were excluded from study sample. Those with co-existing dementia at baseline were excluded.

Study Measures & Outcomes

- Demographics:** age, sex, race, and comorbidities
- HCRU Outcomes**

Inpatient Hospitalizations Outcomes: HCRU outcomes included: all-cause and psych-related inpatient hospitalization, and all-cause and psych-related hospitalizations by type of stay (i.e., short-term [ST-stay], skilled nursing facility [SNF-stay] and long-term [LT-stay]) after 1-year follow-up

ER Outcomes: all-cause ER visits and psychiatric-related ER visits after 1-year

Statistical Methods

- PDP+D vs. PDP-only patients were propensity score matched (PSM) 1:1 using 31 variables (age, sex, race, region and 27 Elixhauser comorbidity characteristics). Covariate balance was assessed using standardized mean difference (SMDs) value of <0.1 between PDP and PDP+D beneficiaries.
- Descriptive statistics were reported as frequencies and percentages for categorical variables; mean, median, and range for continuous variables. Chi-square tests and t-tests were used to describe differences in outcomes associated with PDP+D vs. PDP-only patients.
- HCRU differences between PDP+D vs. PDP-only patients were evaluated using Logistic regressions controlled for demographic characteristics, comorbidities, and coexisting insomnia.
- Analyses were performed using SAS® Enterprise Server via the CMS Virtual Research Data Center.

RESULTS

- From the eligible patients of 12,484 (i.e., study population) who met our study inclusion and exclusion criteria, 85.3% (n=10,609) had diagnosis of PDP+D compared to 14.7% (n=1,855) for PDP-only.
- Patient selection/characteristics and descriptive statistics for the matched groups are described in Figure 1 and Table 1, respectively. Prior to PSM, the mean age and percentage of females was 76 and 47.4%, and 71 years and 52%, in the PDP+D and PDP-only groups, respectively.

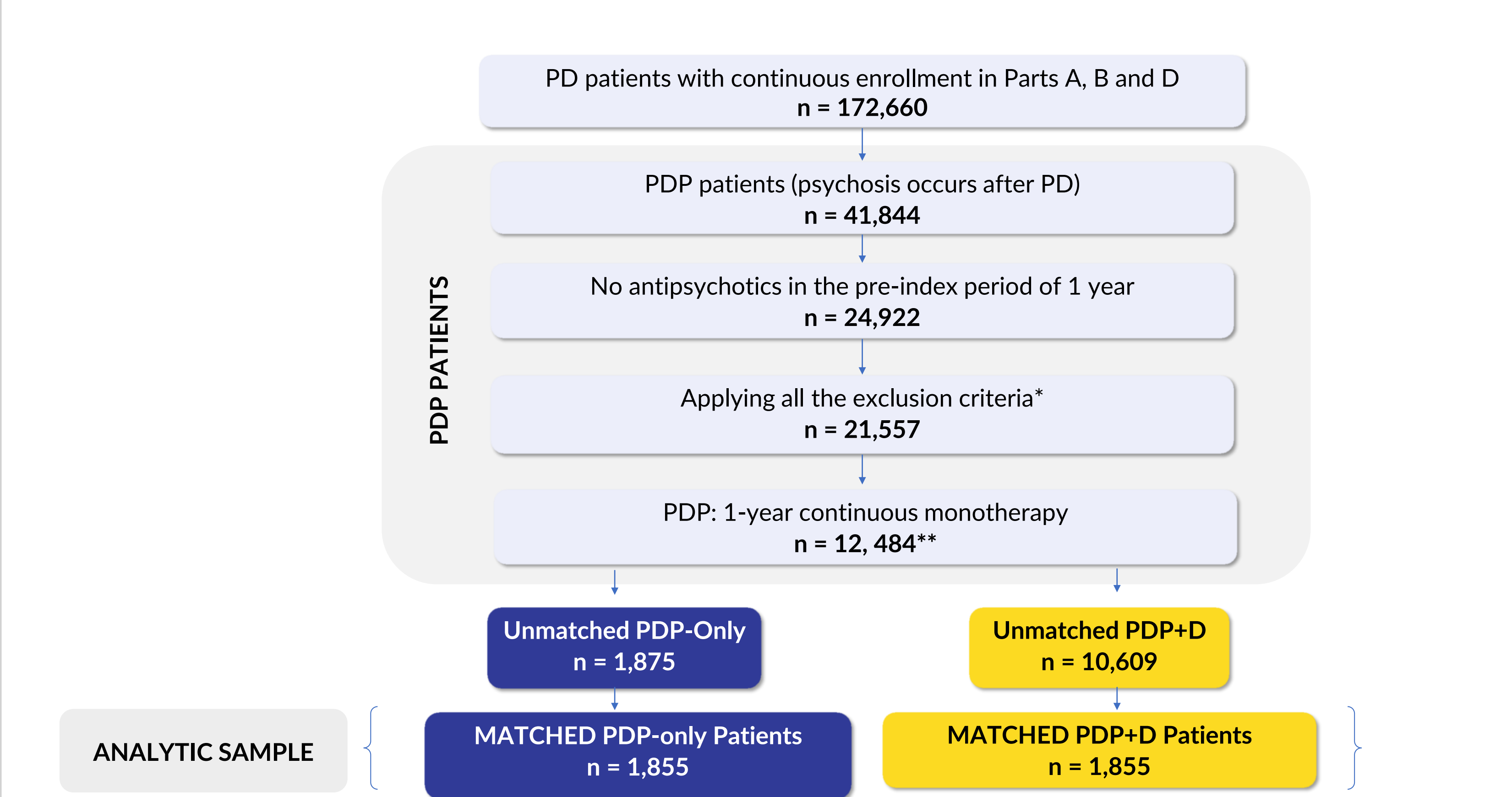
Table 1: Demographic Characteristics of PDP Patients with Dementia (PDP+D) or without Dementia (PDP-only)

Characteristics	PDP-only (n = 1,855; 50%)	PDP+D (n = 1,855; 50%)	SMD
Age (in years)			
Mean (SD)	71.68 (8.07)	71.77 (7.99)	0.01
Median (IQR)	72 (66, 77)	72 (67, 77)	
Minimum, Maximum	41, 99	41, 95	
Female, n (%)	962 (51.86%)	923 (49.76%)	0.042
Race, n (%)			
White	1,639 (88.36%)	1,649 (88.89%)	0.017
Black	71 (3.83%)	91 (4.91%)	0.053

PDP, Parkinson's disease psychosis; PDP+D, Parkinson's disease psychosis with Dementia; SD, standard deviation; IQR, interquartile range; SMD, standardized mean differences

RESULTS (Cont.)

Figure 1. Patient Disposition Flow Chart



*Diagnosis of secondary parkinsonism, delirium, other psychotic disorder, alcohol/drug-induced psychosis, schizophrenia, paranoia, or personality disorders; **Delete additional records with missing data (n=4,159)

PD, Parkinson's Disease; PDP, Parkinson's Disease Psychosis; PDP+D, Parkinson's Disease Psychosis with Dementia

Table 2. Comorbidities among PDP Patients without Dementia (PDP) and PDP-only Patients with Dementia (PDP+D)

Comorbidities n (%)	PDP-only (n = 1,855; 50%)	PDP+D (n = 1,855; 50%)	SMD
Congestive Heart Failure	205 (11.05%)	189 (10.19%)	0.028
Cardiac Arrhythmia	377 (20.32%)	359 (19.35%)	0.024
Valvular Disease	159 (8.57%)	127 (6.85%)	0.065
Pulmonary Circulation Disorder	60 (3.23%)	56 (3.02%)	0.012
Peripheral Vascular Disease	296 (15.96%)	268 (14.45%)	0.042
Hypertension Uncomplicated	1,178 (63.50%)	1,119 (60.32%)	0.066
Hypertension Complicated	229 (12.35%)	205 (11.05%)	0.04
Paralysis	37 (1.99%)	34 (1.83%)	0.012
Other Neurological Disorders	1,701 (91.70%)	1,675 (90.30%)	0.049
Chronic Pulmonary Disease	283 (15.26%)	262 (14.12%)	0.032
Diabetes Uncomplicated	390 (21.02%)	360 (19.41%)	0.04
Diabetes Complicated	231 (12.45%)	200 (10.78%)	0.052
Hypothyroidism	419 (22.59%)	368 (19.84%)	0.067
Renal Failure	226 (12.18%)	199 (10.73%)	0.046
Liver Disease	45 (2.43%)	31 (1.67%)	0.053
Peptic Ulcer Disease excluding bleeding	12 (0.65%)	14 (0.75%)	0.013
Lymphoma	22 (1.19%)	17 (0.92%)	0.026
Metastatic Cancer	19 (1.02%)	15 (0.81%)	0.023
Solid Tumors without Metastasis	150 (8.09%)	140 (7.55%)	0.02
Rheumatoid Arthritis	108 (5.82%)	104 (5.61%)	0.009
Coagulopathy	87 (4.69%)	61 (3.29%)	0.072
Obesity	172 (9.27%)	131 (7.06%)	0.081
Weight Loss	136 (7.33%)	110 (5.93%)	0.056
Fluid and Electrolyte Disorders	336 (18.11%)	192 (10.34%)	0.063
Blood Loss Anemia	25 (1.35%)	23 (1.24%)	0.01
Deficiency Anemia	151 (8.14%)	147 (7.92%)	0.008
Depression	706 (38.06%)	656 (35.36%)	0.056

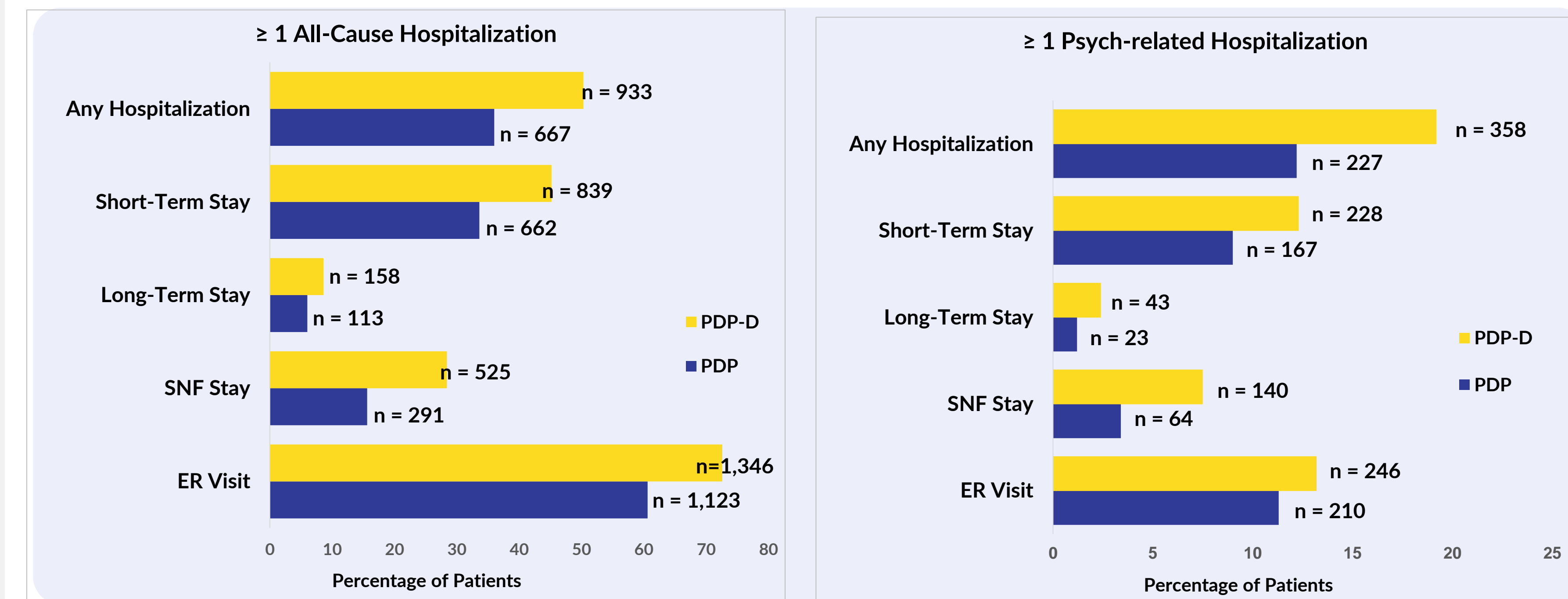
PDP, Parkinson's disease psychosis; PDP+D, Parkinson's disease psychosis with Dementia; SMD, standardized mean differences

- From the unmatched pool of PDP+D and PDP-only groups, patients were propensity score-matched in a 1:1 ratio, yielding PDP+D (n=1,855) and PDP (n=1,855) patients. Mean age (72 years), gender (50% males), and comorbidity profile were similar in both groups.

RESULTS (Cont.)

- After matching, both groups were balanced with respect to demographics and comorbidities. (Table 1-2).
- PDP+D patients had 24% higher rate of all-cause hospitalizations (50.3% vs. 36.0%; p<0.05) compared to PDP. All-cause short-term stays, SNF stays, and LT-stays were significantly higher for PDP+D patients compared to PDP (p<0.05). (Figure 2)

Figure 2. HCRU Rates of All-cause and Psychiatric-related Hospitalizations in PDP patients with and without Dementia



*All group differences were significant (p<0.05)

HCRU, healthcare resource utilization; PDP, Parkinson's disease psychosis; PDP+D, Parkinson's disease psychosis with Dementia; SNF, skilled nursing facility; ER, emergency room

- Similarly, 19.3% of PDP+D reported ≥1 psychiatric inpatient hospitalizations compared to 12.2% of PDP-only (p<0.05). Short-term stays, SNF-stays and LT-stays were significantly higher among patients on PDP+D vs. PDP-only.(Figure 2).
- All-cause ER visits were significantly higher in the PDP+D (p<0.05) compared to PDP-only patients (Figure 2). Similarly, psychiatric ER visits (13.3% vs. 11.3%; p<0.05) were also statistically higher among PDP+D patients compared to PDP.

Limitations

- The study has limitations that are common to administrative claims database analyses. Any secondary databases such as Medicare claims data, may contain coding errors, missed claims, bias introduced by omission of variables, and these should be considered as limitations to this type of data.
- Identification of psychosis was based on a diagnosis of psychosis-related hallucinations and delusions -- so it is likely that PDP diagnosis is underestimated.
- Residual confounding may still exist, even though the study was adjusted for potential confounding issues through appropriate propensity score matching and covariate adjustment.

CONCLUSIONS

- In this analysis of Medicare claims, patients with PDP+D have 10% and 12% higher all-cause hospitalization and ER visit rates vs patients with PDP-only.
- PDP+D also resulted in higher psych-related hospitalizations and ER visits compared to PDP-only.
- Future investigations examining the cost impact of co-existing dementia among PDP patients are needed.

REFERENCES

- Segal GS, Xie SJ, Paracha SU, Grossberg GT. Psychosis in Parkinson's Disease: Current Treatment Options and Impact on Patients and Caregivers. J Geriatr Psychiatry Neurol. 2021 Jul;34(4):274-279. doi: 10.1177/08919887211018280. PMID: 34219522.
- Fredericks D et al. Parkinson's disease and Parkinson's disease psychosis: a perspective on the challenges, treatments, and economic burden. Am J Manag Care. 2017; 23(5):S83-S92.

