

Prescription Opioid Use Among Cancer Patients Before and After the Onset of COVID-19: Evidence from Real-world Data

Bo Zhou, PhD; Mona Pathak, PhD; Rafia Rasu, PhD and Usha Sambamoorthi, PhD
Dept of Pharmacotherapy, College of Pharmacy, University of North Texas Health Science Center, Fort Worth, TX, USA



Background

- Opioids are commonly used in cancer pain management.
- COVID-19 lockdown may have reduced access to opioids among cancer survivors.

Objective

- To compare opioid prescription rates among cancer survivors before and after the onset of COVID-19 pandemic.

Methods

Study Design: Retrospective cohort analysis and propensity score matching.
Data Source: Electronic Health Records (EHR) data from TriNetX, a global federated health research network across 76 healthcare organizations. Data was accessed on April 30, 2023.
Study Cohorts: The pre-COVID-19 cohort included 1,046,652 patients who had any cancer diagnosis between Mar 01, 2018 and Feb 28, 2019. The post-COVID-19 onset cohort included 1,092,302 cancer patients with diagnosis between Apr 01, 2020 and Mar 31, 2021. The index event was defined as the first cancer diagnosis during the above time window.
Inclusion/ Exclusion Criteria: Patients who were less than 18 years old at the index event, and those who deceased within one year of first cancer diagnosis were excluded.
Key Outcome Variables: Any opioid analgesics prescription and number of opioid prescriptions within one year of the index event.
Additional Outcome Variables: Opioid dependence and opioid abuse.
Statistical analysis:

- One-to-one Propensity score matching was used to balance the characteristics: age, sex, race, diagnoses including diabetes, hypertensive diseases, overweight, mood disorders, and visual disturbances
- After the PSM, the odds ratio of prescribing opioid after the onset of COVID-19 versus before COVID-19 was calculated.
- All analyses were performed using the TriNetX platform.

Table 1: ICD-10 Codes Used to Identify Cancer Patients

C00-C14	Malignant neoplasms of lip, oral cavity and pharynx
C15-C26	Malignant neoplasms of digestive organs
C30-C39	Malignant neoplasms of respiratory and intrathoracic organs
C40-C41	Malignant neoplasms of bone and articular cartilage
C43-C44	Melanoma and other malignant neoplasms of skin
C45-C49	Malignant neoplasms of mesothelial and soft tissue
C50	Malignant neoplasms of breast
C51-C58	Malignant neoplasms of female genital organs
C60-C63	Malignant neoplasms of male genital organs
C64-C68	Malignant neoplasms of urinary tract
C69-C72	Malignant neoplasms of eye, brain and other parts of central nervous system
C73-C75	Malignant neoplasms of thyroid and other endocrine glands
C76-C80	Malignant neoplasms of ill-defined, other secondary and unspecified sites
C7A	Malignant neuroendocrine tumors
C7B	Secondary neuroendocrine tumors

Figure 1: Propensity Score Density Before and After Matching

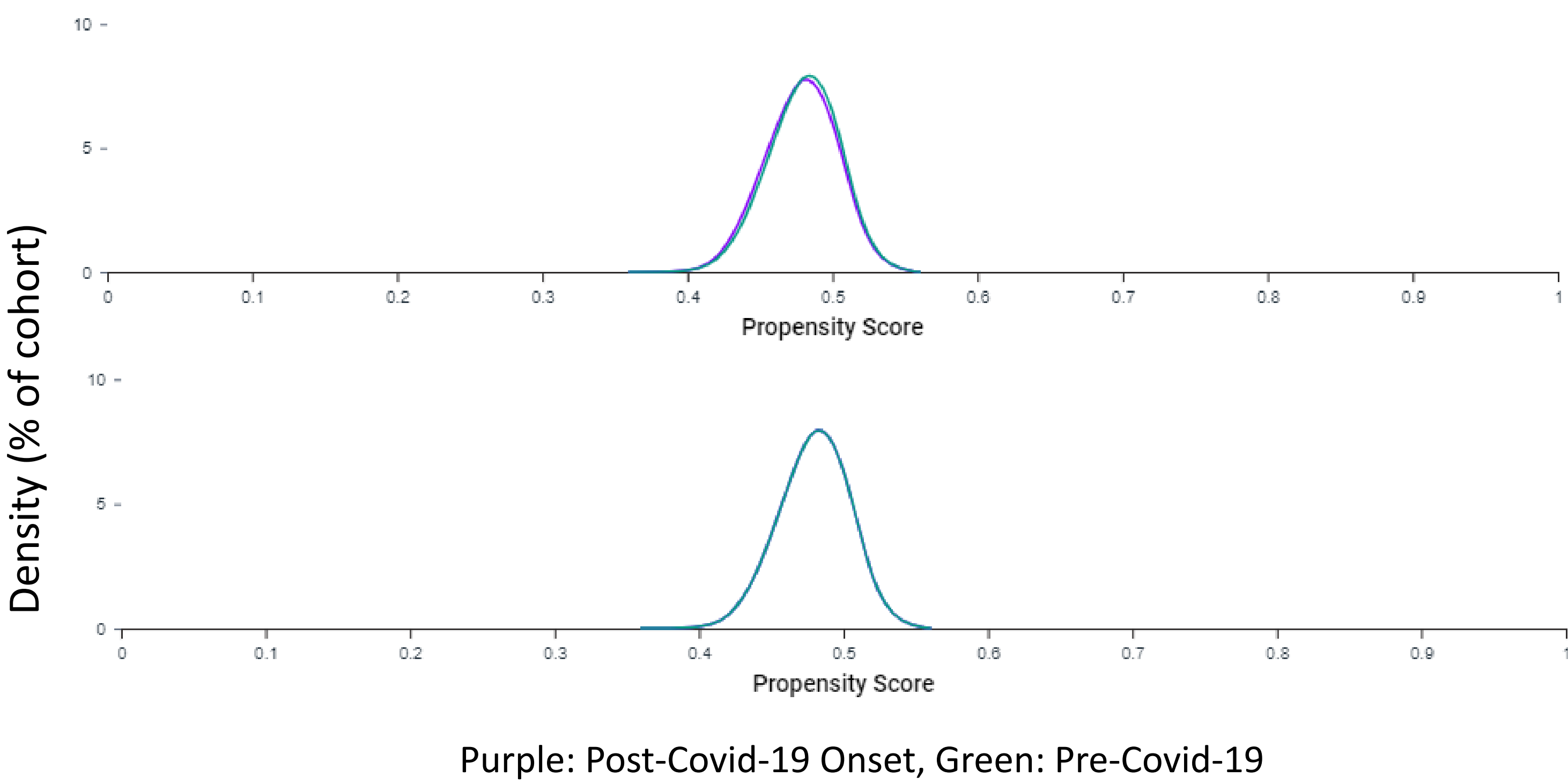
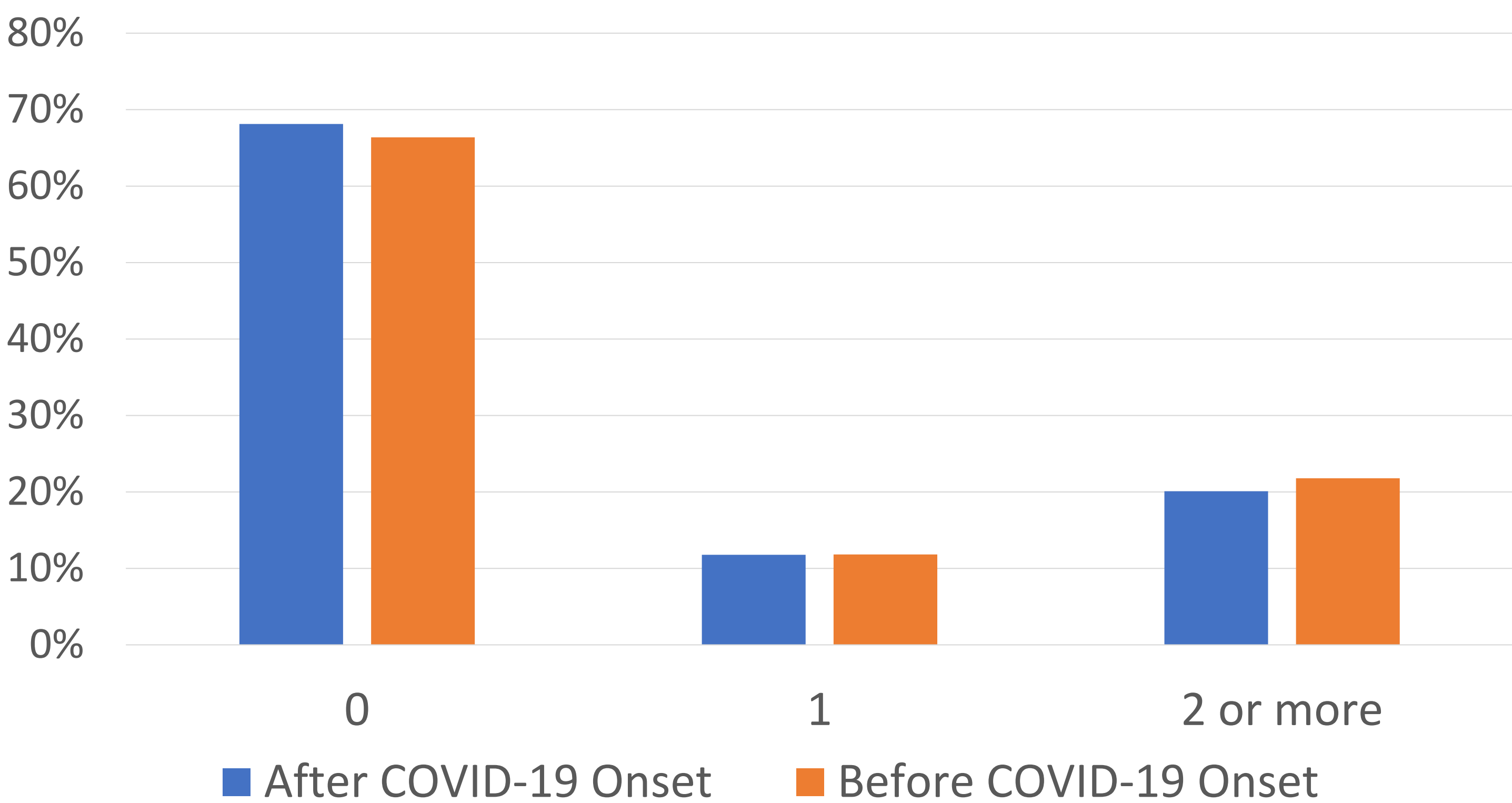


Table 2: Outcome Distribution Before and After the COVID-19 Onset

	Pre-COVID-19	Post-COVID-19 Onset	Odds Ratio	95% CI
Prescription Opioid Use	33.9%	31.1%	0.930	(0.924, 0.935)
Opioid Dependence	0.34%	0.31%	0.918	(0.875,0.964)
Opioid Abuse	0.13%	0.13%	1.002	(0.928,1.083)

Prescription opioid use was identified by VA medication class CN101. Opioid abuse was identified by ICD-10 diagnosis codes F11.10, F11.12, F11.14, F11.15, F11.18, F11.19. Opioid dependence was identified by ICD-10 diagnosis codes F11.20, F11.22, F11.23, F11.24, F11.25, F11.28, F11.29.

Figure 2: Distribution of Annual Opioid Prescriptions Among Cancer Survivors Before and After the COVID-19 Onset



Results

- The combined cohort had mean age 63 at cancer diagnosis, 48% were male, and 73% were white.
- After PSM, 1,033,663 cancer survivors were in both cohorts. The standardized mean difference of all characteristics between the two groups ranges from 0-0.01, indicating a good match.
- Percentage of opioid use among cancer patients declined from 33.6% before COVID-19 to 31.9% after the onset of the pandemic (OR=0.918, 95% CI 0.875-0.964) (Table 2).
- Average number of opioid prescriptions within 1 year of cancer diagnosis declined from 5.3 before to 4.6 after the COVID-19 onset (p<0.001).
- Percentage of opioid dependence among cancer patients from 0.34% to 0.31% (OR=0.918, 95% CI 0.878-0.966) (Table 2).
- There was no change in prevalence of opioid abuse before and after the COVID-19 onset (Table 2).

Discussion

- A small decline in prevalence of prescription opioid use was observed among cancer survivors after the onset of COVID-19 pandemic.
- The average number of opioid prescriptions declined after the COVID-19 onset, indicating a possible impact of the COVID-19 pandemic on the frequency of prescription opioid fills.
- Risk of abuse were low among cancer patients, and there was no statistically significant difference before and after the COVID-19 onset.

Conclusion

- Future studies are needed to distinguish the impact of revised guidelines, opioid prescription policy changes, and COVID-19 lockdown on lower rates of prescription opioid use among cancer survivors.

Strengths and Limitations

Strengths:

- Large sample from electronic health records across multiple health care organizations.
- We were able to balance a wide range of covariates using propensity score matching.

Limitations:

- Unmeasured confounders can bias the results.
- The dosage, strength and duration of opioid prescription were not observed in EHR data.