Prevalence and Correlates of Alcohol Use Disorder Diagnosis among Cancer Survivors in the United States: Insights from a Real-World Study

Jyun-Heng Lai[1], Anton L.V. Avanceña[1,2], Mary M. Velasquez[3], Corwin M. Zigler[4], Christopher R. Frei[5], Michael Pignone[6]

[1]Health Outcomes Division, College of Pharmacy, The University of Texas at Austin, TX
[2]Department of Internal Medicine, Dell Medical School, The University of Texas at Austin, TX
[3]Health Behavior Research and Training Institute, Steve Hicks School of Social Work, The University of Texas at Austin, TX
[4]Department of Statistics and Data Sciences, College of Natural Sciences, The University of Texas at Austin, TX
[5]Pharmacotherapy and Translational Sciences Division, College of Pharmacy, The University of Texas at Austin, TX
[6]Department of Medicine, School of Medicine, Duke University, Durham, NC

INTRODUCTION

- **Alcohol use disorder (AUD)**, a condition characterized by an inability to control drinking despite the harms, is the most common substance use disorder globally.
- AUD among cancer survivors can lead to unique health risks, such as lower overall quality of life, higher readmission rates, and higher readmission-related costs.[1]
- The prevalence of AUD diagnosis in the US is increasing among general adults and specific groups (e.g., veterans and sexual minorities).[2] However, trends in AUD diagnosis among cancer survivors are not well understood.

OBJECTIVES

- To estimate the prevalence of AUD diagnosis among cancer survivors using healthcare claims data
- To identify sociodemographic and clinical characteristics associated with an AUD diagnosis among cancer survivors

METHODS

Data source and study population

- A retrospective, serial cross-sectional study using Merative™ MarketScan® Commercial Claims and Medicare Supplemental data from 2011 to 2021.
- Eligible individuals were 18 years or older; had a history of malignant neoplasm; and 6-month continuous enrollment prior to the earliest date of their cancer diagnosis in each calendar year (cohort entry date).

Study outcomes and analysis

- Among cancer survivors, we identified those who had a **recent AUD diagnosis** from inpatient and outpatient claims
- We calculated the **annual prevalence of AUD diagnoses** for each year in all cancer survivors and in specific subgroups (e.g., survivors of alcohol-related cancers and recipients of antineoplastic agents).
- We pooled data across all years and calculated the **period prevalence of AUD diagnoses** among the entire sample.
- We compared socio-demographics (e.g., age, sex, median income) and clinical characteristics (e.g., healthcare utilization, physical and mental health comorbidities, non-alcoholic SUDs) between cancer survivors with and without AUD using independent t-test and chi-square test.
- We conducted multivariable logistic regressions in a stepwise iterative process to explore the **potential factors associated with of AUD diagnoses**.

RESULTS

Prevalence of AUD diagnoses in overall cancer survivors: Of 5,956,137 eligible cancer survivors, 105,778 (1.78%) had received an AUD diagnosis (Tables 1-3).

Total and annual prevalence of AUD diagnoses

- The annual prevalence of AUD diagnosis increased from 0.78% in 2012 to 1.43% in 2021 (p<0.001; Figure 1).
- The annual prevalence of AUD increased over time among cancer survivors receiving antineoplastic agents, receiving care in inpatient and outpatient settings, as well as among alcohol-related cancer survivors from 2012 to 2021 (Figure 1).
- The prevalence of AUD diagnoses in 2021 were highest among liver (11.37%), laryngeal (6.36%), esophageal (5.59%), and pharyngeal (4.36%) cancer survivors (Figure 2).

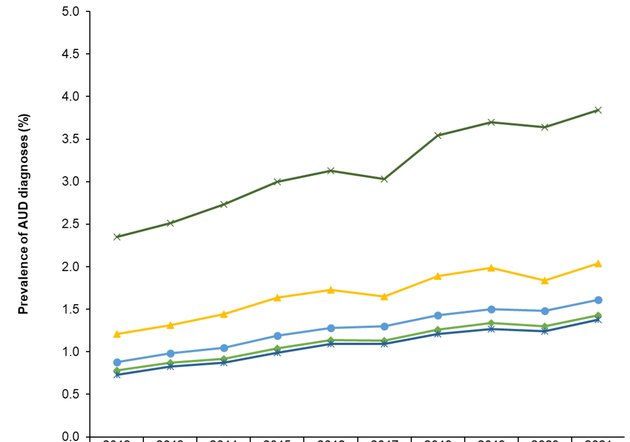
Characteristics of cancer survivors with and without AUD diagnoses

- Compared to those without AUD, cancer survivors with AUD were more likely to be male, used more healthcare services, and had more physical and mental health comorbidities (Tables 1-2).
- Cancer survivors with AUD had substantially higher proportions of non-alcohol SUD diagnoses than those without AUD (e.g., cannabis, 4.2% vs. 0.2%; cocaine, 1.9% vs. 0.03%; Table 3).

Multivariable analysis

- Multivariable regression analysis revealed that male sex, alcohol-related cancers, mental health diagnoses, and other substance use disorders were associated with around 2-5 times greater odds of an AUD diagnosis (Figure 3).

Figure 1. Trends in prevalence of AUD diagnoses among cancer survivors and in specific subgroups, 2012-2021



	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
All cancer survivors	0.8	0.9	0.9	1.0	1.1	1.1	1.3	1.3	1.3	1.4
Alcohol-related cancers	0.9	1.0	1.1	1.2	1.3	1.3	1.4	1.5	1.5	1.6
Anti-neoplastic therapies	1.2	1.3	1.4	1.6	1.7	1.7	1.9	2.0	1.8	2.0
Inpatient	2.4	2.5	2.7	3.0	3.1	3.0	3.5	3.7	3.6	3.8
Outpatient	0.7	0.8	0.9	1.0	1.1	1.1	1.2	1.3	1.2	1.4

Figure 2. Trends in prevalence of AUD diagnoses among alcohol-related cancer survivors, 2012-2021

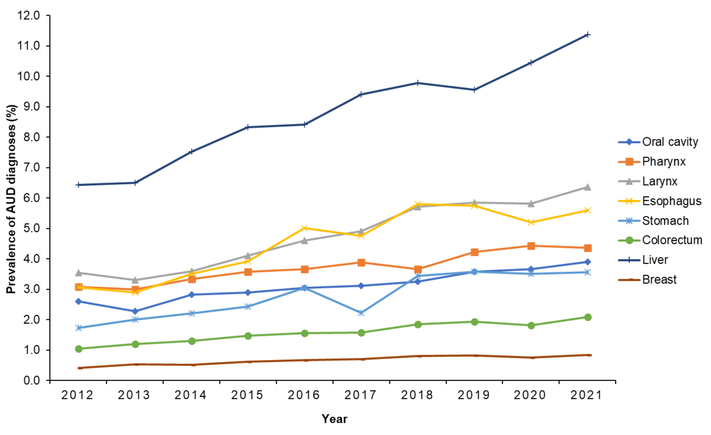


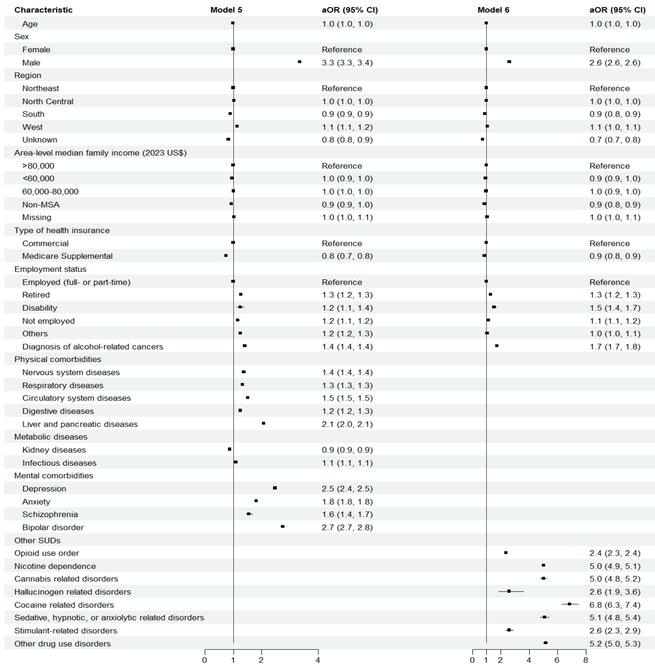
Table 1. Sociodemographic and clinical characteristics of cancer survivors

Characteristic	Cancer survivors (n = 5,956,137)	With AUD (n = 105,778)	Without AUD (n = 5,850,359)
Age, mean (SD), in years	60.1 (14.0)	59.1 (12.5)	60.1 (14.0)
Male sex, %	44.9	65.7	44.6
Alcohol-related cancers, %	21.6	27.7	21.5
Antineoplastic therapies, %	10.9	18.2	10.7
Chemotherapy	8.7	14.6	8.6
CCI, mean (SD)	3.2 (3.4)	5.1 (4.2)	3.1 (3.4)
Respiratory diseases	41.0	59.4	40.6
Circulatory system diseases	58.9	75.7	58.6
Liver and pancreatic diseases	11.3	28.4	11.0
Infectious diseases	10.7	19.4	10.7
Depression	14.7	39.2	14.3
Anxiety	17.1	39.5	16.7
Schizophrenia	0.2	0.9	0.2
Bipolar disorder	1.1	6.0	1.0
Antidepressants	23.6	44.2	23.2
Tranquilizers/antipsychotics	2.6	10.2	2.5

Table 2. Healthcare utilization among cancer survivors with and without AUD diagnoses

Type of healthcare service	Cancer survivors (n = 5,956,137)	With AUD (n = 105,778)	Without AUD (n = 5,850,359)
Number of inpatient visits, %			
0	73.1	38.3	73.7
1	16.2	28.0	16.0
≥2	10.7	33.7	10.3
Number of ER visits, %			
0	61.7	26.7	62.3
1	16.4	21.2	16.3
2	8.2	15.0	8.1
≥3	13.7	37.1	13.3
Number of outpatient visits, mean (SD)	30.7 (45.7)	57.2 (68.2)	30.3 (45.2)

Figure 3. Forest plots of multivariable regression analysis



DISCUSSION

- The prevalence of AUD diagnosis in this study is comparable to previous estimates (e.g., 5.1% in US male veterans with cancer, 2.9% among hospitalized cancer survivors).[3]
- Trends in AUD diagnosis may be due to increased guideline-concordant screening, improved survival and higher risk for chemical coping, or greater access to alcohol.[4,5]
- The results of multivariable analysis are consistent with previous studies that found similar predictors of AUD diagnosis (e.g., male sex, younger age, alcohol-related cancers, mental health disorders, and other SUDs).[6,7]
- Study limitations include using MarketScan convenience sample, inability to establish causal associations, lack of key variables, and potential underreporting using diagnosis codes.

Conclusions

- AUD diagnoses among US cancer survivors with private health insurance has increased over time, mirroring trends in the general population.
- Cancer care should integrate AUD screening and treatment to mitigate the unique risks associated with alcohol use and misuse in this population.

Table 3. Alcohol use disorder and co-occurring diagnosis of other substance use disorders, 2012 and 2021

SUD	Cancer survivors (n = 5,956,137)	With AUD (n = 105,778)	Without AUD (n = 5,850,359)
Opioid use order	0.7	5.5	0.7
Nicotine dependence	7.2	32.3	6.8
Cannabis-related disorders	0.3	4.2	0.2
Hallucinogen-related disorders	<0.1	0.1	<0.1
Cocaine-related disorders	<0.1	1.9	<0.1
Sedatives-related disorders	0.2	2.4	0.1
Stimulant-related disorders	<0.1	0.9	<0.1
Other drug use disorders	0.6	6.4	0.5

References

1. Lai JH, et al. *J Natl Compr Canc Netw*. 2024;22(1):e237076.
2. Grant BF, et al. *JAMA Psychiatry*. 2017;74(9):911-923.
3. Ho P, et al. *Psychosomatics*. 2018;59(3):267-276.
4. Curry SJ, et al. *JAMA*. 2018;320(18):1899-1909.
5. Miller KD, et al. CA *Cancer J Clin*. 2022;72(5):409-436.
6. Sanford NN, et al. *J Natl Compr Canc Netw*. 2020;18(1):69-79.
7. Heffner JL, et al. *Cancer Epidemiol Biomarkers Prev*. 2024;33(4):600-607.

Acknowledgements

The authors thank TxCORE for providing and maintaining the data used in this study and in assisting in the completion of the research. Funding for this work was provided by a K12 award from UT Health San Antonio to Dr. Anton Avanceña.

Abbreviations: AUD, alcohol use disorder; aOR, adjusted odds ratio; CCI, Charlson Comorbidity Index; CI, confidence interval; SUD, substance use disorder; SD, standard deviation.