HHS Public Access

Author manuscript

Drug Alcohol Depend. Author manuscript; available in PMC 2021 September 01.

Published in final edited form as:

Drug Alcohol Depend. 2020 September 01; 214: 108174. doi:10.1016/j.drugalcdep.2020.108174.

Correlates of Alcohol Use Disorder Pharmacotherapy Receipt in Medically Insured Patients

Alexander Rittenberg[a], **Anika L. Hines**[a], **Anika A. Alvanzo**[a], **Geetanjali Chander**[a]

[a]Johns Hopkins University School of Medicine, 1830 E Monument Street, Baltimore, MD, 21287, United States

Abstract

Background—Alcohol use disorder is a highly prevalent disease with multiple medications available for treatment. The overall prevalence of patients receiving pharmacotherapy is believed to be low and the characteristics and comorbidities that affect receipt are not well-established.

Methods—We created a dataset from Truven Health Analytics MarketScan Commercial Claims and Encounters Database of patients with an outpatient encounter for alcohol abuse or dependence in 2014. We subsequently identified patient characteristics, comorbid medical, psychiatric, or substance use disorders, as well as encounter provider specialties and, using multivariable logistic regression, assessed which variables correlated with increased or decreased receipt of pharmacotherapy for alcohol use disorder for this population.

Results—In our dataset of 123,355 patients, patient receipt of pharmacotherapy for alcohol use disorder was 3.3%, and 9.3% when restricted to the former diagnosis of alcohol dependence only. Male sex, younger age, alcohol-related liver disease, and cannabis use disorders correlated with decreased receipt whereas comorbid major depressive disorders and anxiety disorders correlated with increased receipt. Compared to patients seen by psychiatrists, those seen by primary medical doctors had a lower odds of receiving pharmacotherapy.

Conclusions—Pharmacotherapy for alcohol use disorder is an underutilized treatment modality with a low prevalence of prescription in insured individuals. Patients with specific characteristics and comorbidities are less likely to receive this treatment and greater focus on these patients and in the primary care setting can allow for increased prescribing of these medications.

Keywords

Alcohol use disorder; Alcohol abuse; Alcohol dependence; Pharmacotherapy; Comorbidities

Corresponding author: Alexander Rittenberg, Tel.: 804-828-3144, alexander.rittenberg@vcuhealth.org.

Contributors: All work in this manuscript is original. All authors had access to the data and played a role in writing the manuscript, and each accepts responsibility for the content. All authors approve of the final version of this manuscript.

Conflict of Interest: No conflict declared.

1 Introduction

Alcohol use accounts for a high burden of disease globally. In 2016, alcohol use was causally related to 2.8 million deaths corresponding to 2.2% of female and 6.8% of male deaths (Griswold et al., 2018). Alcohol use disorder (AUD) can result in alcohol-related liver disease, cirrhosis, chronic pancreatitis; is associated with the development of multiple chronic diseases such as hypertension, diabetes mellitus, heart disease, depression (Rehm et al., 2003; Shield et al., 2013); is an independent risk factor for HIV (Baliunas et al., 2010) and other substance use and mental health disorders (Grant et al., 2015); and is associated with malignancies of the liver, oropharynx, upper gastrointestinal tract, pancreas, breast, and colon (Griswold et al., 2018; Praud et al., 2016; Shield et al., 2013). In the United States adult population, the lifetime prevalence of AUD is 29% (Grant et al., 2015) and is the third leading cause of preventable death (Mokdad et al., 2004). Excess drinking results in a financial burden to the American populace of almost 250 billion dollars annually (Sacks et al., 2015).

The treatments for AUD are largely divided into behavioral (cognitive behavioral therapy, motivational enhancement therapy, and 12-step facilitation) and pharmacotherapy interventions (Fiellin et al., 2000). Common pharmacotherapies include those which are Food and Drug Administration (FDA)-approved for AUD -- acamprosate, disulfiram, and oral and injectable naltrexone -- and numerous additional medications with off-label use and variable evidence (Jonas et al., 2014). Specifically, acamprosate and naltrexone have a low number needed to treat (NNT) to prevent return to any alcohol consumption with NNT of 12 and 20, respectively (Jonas et al., 2014). As such, medications for alcohol use disorder (MAUD) are supported by evidence attesting to their efficacy and are recommended by multiple society guidelines. MAUD carries Grade 1B evidence from the American Psychiatric Association (Reus et al., 2018), Grade A evidence in the official journal of the American Academy of Family Physicians (Winslow et al., 2016), and identified as an established therapeutic option by an expert consensus panel by the National Institute on Alcohol Abuse and Alcoholism and the Substance Abuse and Mental Health Services Administration (Substance Abuse and Mental Health Services Administration and National Institute on Alcohol Abuse and Alcoholism, 2015). These FDA-approved medications, particularly naltrexone and acamprosate, are considered safe when used according to the guidelines with serious adverse effects being rare (Bouza et al., 2004; Chick, 1999).

Despite safe prescribing options for AUD, studies undertaken in the Veteran's Administration (VA) population show that only a minority of patients are prescribed pharmacotherapy as low as 2.8-3.2% (Harris et al., 2012, 2010). In a more recent VA study, MAUD was prescribed to 6.8% of hepatitis C virus (HCV)-negative patients with clinically-diagnosed AUD which decreased to 3.2% for any patient with an Alcohol Use Disorders Identification Test Consumption (AUDIT-C) questionnaire score of at least 5 (Owens et al., 2018). Rates were similarly low -- 2.3% in 2009 to 3.8% in 2015 -- when evaluated in the Oregon Medicaid patient population (McCarty et al., 2018). Similar low rates of MAUD prescribing are also seen in specific subpopulations. For patients with psychiatric comorbidities, prescribing rates varied from 6.8% for patients with schizophrenia to 11.1% for patients with bipolar disorder (Rubinsky et al., 2015); 5.6% to 6.2% for patients with

comorbid HCV (Frost et al., 2019; Owens et al., 2018); and 1.0%-5.1% for comorbid Human Immunodeficiency Virus (HIV) (Frost et al., 2019; Oldfield et al., 2020). These low rates of MAUD are corroborated by a low number of prescriptions -- 674,000 in 2006 for the 11,000,000 patients with AUD (Mark et al., 2009).

Despite evidence demonstrating improved patient outcomes (Jonas et al., 2014) and decreased healthcare costs (Baser et al., 2011), MAUD remains an underutilized treatment modality (Harris et al., 2010; Mark et al., 2009). Recent literature demonstrates low prescription rates of MAUD but is focused on specific populations, such as the VA or Medicaid or individuals with a distinct medical or psychiatric comorbidity, and does not specifically evaluate the insured population at large. Considering that one recent study notes MAUD being on formulary in over 90% of private health plans with generic oral naltrexone unrestricted in 98.9% (Reif et al., 2016), access to these medications exists in private health plans, but actual rates of MAUD receipt for those individuals with such access requires specific assessment. Consequently, in this study, we seek to determine the prevalence of prescribing MAUD in a large, commercial database of medically insured individuals to assess if findings of low prescription rates from the current literature extend to this population. We further aim to identify correlates which correspond to increased or decreased receipt, including provider type, so as to promote appropriate interventions.

2 Methods

2.1 Study Sample

Data from this study was obtained from the Truven Health Analytics MarketScan Commercial Claims and Encounters Database (“MarketScan”) for the year 2014. The MarketScan database is composed of encrypted, de-identified, person-specific insurance claims from approximately 350 private-sector payers covering outpatient and inpatient service claims including prescription drug claims. This study was exempt from IRB review.

From the 2014 MarketScan database data, we identified patients with a claim for an outpatient healthcare encounter with a principal or non-principal diagnosis of alcohol abuse (305.0x) or alcohol dependence (303.9x) based on the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) diagnostic codes. Notably, these diagnostic codes comprise DSM-4 diagnoses related to AUD as well as other non-standard diagnostic terminology related to AUD such as “Alcoholism” or “Alcoholic”.

2.2 Dataset

We created a patient-level dataset including individuals with an outpatient claim with the diagnoses of interest. Starting with the 2014 outpatient claims file containing the principal and non-principal diagnostic codes of interest, we identified each unique (synthetically generated) patient identifier represented among the claims. All patients must have had at least one claim with one of the aforementioned codes (305.0x or 303.9x) during 2014. Patients with multiple claims were included in the analysis only once. We created indicator flags for additional independent variables of interest from the 2014 inpatient and pharmaceutical files linked to Redbook data. Using the unique patient identifiers of the study

population and the indicator flags, we linked additional inpatient and pharmacological files for individual patients in the study population. Merging MarketScan outpatient, inpatient, and pharmaceutical files, we created a patient-level dataset of 123,355 unique patients with an outpatient claim for alcohol abuse or dependence as well as their inpatient and pharmaceutical claims for data year 2014.

2.3 Independent measures

In addition to AUD diagnoses, we collected available demographic information including patient age (years) and sex (male, female). Data on age in years was categorized in groups (18-34, 35-44, 45-54, 55-64, 65+) given the potential for a non-linear relationship (Harris et al., 2012) and modeled on previous studies on AUD and MAUD (Frost et al., 2019; Harris et al., 2012, 2010; Owens et al., 2018; Williams et al., 2017a, 2017b, 2014). Racial or ethnic demographic data is not available in the MarketScan database and is not reported for this study.

Additionally, we captured information about specialty and discipline of providers for all clinical encounters as well as ICD-9-CM-coded comorbidities for the study population. Using available MarketScan provider specialty codes, we identified the following provider types: Primary Care Physician (PMD -- physicians from the specialties of “Internal Medicine”, “Family Practice”, “Geriatric Medicine”, or “Preventative Medicine”); Primary Care Nurse Practitioner (NP), Primary Care Physician Assistant (PA), Psychiatrist, Psychiatry NP (Psychiatric Nurse Practitioner), Psychologist, and Addiction Treatment Specialists (a category compromised of medical and non-medical counselors who focus on substance use disorders, including “Mental Health/Chemical Dependency not elsewhere classified”, “Mental Health facilities”, “Chemical Dependency Treatment Center”, “Mental Health/Chemical Dependency Day Care”, or “Residential Treatment Center”).

We identified diagnoses of interest for: 1) medical comorbidities that result as a consequence of AUD; 2) comorbid mental health diagnoses; and 3) comorbid substance use disorders (SUDs) and linked these with the individual patient identifiers. As a diagnosis of interest, HIV was also included. Medical comorbidities were identified based on ICD-9-CM codes for those diagnoses considered to be 100% attributable (Armed Forces Health Surveillance Center, 2011) to chronic cases of AUD, diagnoses for acute cases of AUD, and diagnoses for direct alcohol-attributable diseases. All medical, psychiatric, and substance use comorbidities and their corresponding ICD-9-CM codes are listed in Supplementary Table 1.

2.4 Dependent measures

Our primary dependent measure was receipt of MAUD, restricted to any of the three FDA-approved medications. While some analyses have included patients prescribed topiramate (Frost et al., 2019; Oldfield et al., 2020; Owens et al., 2018; Rubinsky et al., 2015), a previous study in patients with psychiatric comorbidities noted higher rates of MAUD in patients with bipolar disorder possibly related to topiramate’s indication for both bipolar disorder and AUD (Rubinsky et al., 2015). As a consequence, we excluded non-FDA approved MAUD given their possible use for alternative indications and to maximize specificity of the prescribed medications included in our study. To quantify this variable, we

used prescription identification codes for disulfiram, acamprosate, oral and intramuscular naltrexone. These codes were subsequently used to identify which patients in the dataset had an insurance claim for one or more of these prescriptions.

2.5 Statistical approach

We performed a bivariate analysis using chi-squared tests to compare receipt of MAUD across the entire spectrum of AUD (DSM-IV alcohol abuse and dependence) by demographics, provider specialty encounter type, medical comorbidities, comorbid mental health diagnoses, and comorbid SUDs. We, then, used logistic regression to calculate unadjusted odds ratios for receipt of AUD pharmacotherapy for each of these covariates. We subsequently used a multivariable logistic regression in a stepwise backwards selection approach to determine correlates of receiving MAUD from which adjusted odds ratios were derived. Only those patients who were evaluated by a provider of interest were included in the multivariable logistic regression. This process started with the full model including all covariates and allowed the statistical software to evaluate and remove variables and determine the optimal model based on statistical parameters. We subsequently followed the same procedures, restricting our sample to individuals with a diagnosis of alcohol dependence only, to assess prevalence of MAUD receipt and factors associated with this.

3 Results

3.1 Sample characteristics and comorbidities

A total of 123,355 subjects met inclusion criteria with an ICD-9-CM diagnosis of alcohol abuse (N=105,779, 85.8%) or alcohol dependence (N=17,576, 14.3%) and were included in this study. The demographics of these subjects and their receipt of MAUD by demographics are detailed in Table 1. Almost two-thirds (64.5%) of the sample was male. The largest age group was 35-44 years-old with 41.2% of the total subjects and the smallest age group was the 18-34 years-old comprising just 4.3% of the total subjects. Of those patients evaluated by a provider of interest (N=36,852), the largest proportion of subjects had been evaluated by a PMD (11.3%) followed by an Addiction Treatment Specialist (9.0%), followed by a Psychiatrist (6.43%). Of the total 123,355 subjects in our population, 3.3% received a prescription for an FDA-approved MAUD. When we restricted our sample to only individuals with a diagnosis of alcohol dependence, 9.3% of the sample received a prescription for pharmacotherapy.

Multiple comorbid medical sequelae of AUD, direct alcohol-attributable medical diseases, comorbid mental health diagnoses, comorbid SUDs, and HIV were evaluated with relation to the prevalence of MAUD receipt as shown in Table 2. Of the 123,355 subjects, fewer than 100 subjects were found to have recorded diagnoses of alcoholic cardiomyopathy, alcoholic gastritis, alcoholic neuropathy, and chronic pancreatitis, and none received MAUD. Of the 331 subjects with a recorded diagnosis of alcoholic liver disease and the 212 subjects with a recorded diagnosis of cirrhosis or one of its medical sequelae, 2.4% and 1.4% received MAUD, respectively. A greater number of subjects were recorded as having a comorbid mental health diagnoses in particular comorbid major depressive disorders or anxiety disorders with 5,238 and 6,001 subjects, respectively. Of those subjects with a comorbid

mental health diagnosis, the percentage receiving pharmacotherapy ranged between 5-7%. Similarly, a greater number of subjects were recorded as having a comorbid SUD. Tobacco, cannabis, benzodiazepine/sedative, cocaine, and opioid use disorder diagnoses were each present in 1,000 to 6,000 subjects with MAUD receipt varying among 1.2%-5.2% of subjects with these diagnoses. In particular, cannabis use disorders were present in the greatest number of subjects (5,940) with the lowest percentage (1.2%) receiving MAUD of the comorbid SUDs.

3.2 Unadjusted odds ratios

Table 3 details the unadjusted odds ratios associated with MAUD receipt based on demographic characteristics and medical, mental health, and substance use comorbidities. Male sex was associated with a significantly decreased odds of MAUD receipt (odds ratio [OR]: 0.70, confidence interval [CI]: 0.66-0.74). Compared with a reference age range of 18-34 years, age ranges 35-44 years (OR: 5.16, CI: 3.41-7.80), 45-54 years (OR: 11.3, CI: 7.45-17.1), 55-65 years (OR: 10.3, CI: 6.83-15.6), and >65 years (OR: 10.1, CI: 6.64-15.3) were all associated with a significantly increased odds of MAUD receipt.

In terms of provider specialty, being evaluated by a Psychiatrist as compared with a Primary Medical Doctor (PMD) was significantly associated with an increased odds of MAUD receipt (OR: 1.23, CI: 1.10-1.38). In contrast, being evaluated by a Psychologist (OR: 0.63, CI: 0.51-0.78) or an Addiction Treatment Specialist (OR: 0.75, CI: 0.57-0.85) as compared with a PMD was associated with a significantly decreased odds of receipt.

Notably, in the unadjusted odds ratio analysis, no medical comorbidity was significantly associated with an increased or decreased odds of MAUD receipt, whereas multiple mental health comorbid diagnoses were associated with a significantly increased odds of MAUD receipt including major depressive disorders (OR: 1.83, CI: 1.63-2.07), bipolar affective disorders (OR: 2.20, CI: 1.65-2.93), anxiety disorders (OR: 1.95, CI: 1.74-2.18), mood disorders NOS (OR: 1.75, CI: 1.27-2.42), and post-traumatic stress disorder (OR: 1.90, CI: 1.34-2.71). Specific comorbid SUDs were associated with increased odds of MAUD receipt -- opioid use disorders (OR: 1.31, CI: 1.14-1.50) and benzodiazepine/sedative use disorders (OR: 1.62, CI: 1.27-2.07) -- whereas other SUDs were associated with decreased odds of pharmacotherapy receipt -- cocaine use disorders (OR: 0.68, CI: 0.50-0.93), cannabis use disorders (OR 0.35, CI: 0.28-0.45), amphetamine use disorders (OR: 0.55, CI: 0.33-0.93), and tobacco use disorders (OR: 0.72, CI: 0.59-0.87).

3.3 Adjusted odds ratios

Table 3 shows the results of the multivariable logistic regression for correlates of receiving MAUD for all subjects meeting inclusion criteria. Male sex remained significantly associated with a decreased odds of receiving MAUD (OR: 0.68, CI: 0.55-0.84). Again seen was that compared with those subjects aged 18-34, each older age range had an increased odds of MAUD receipt -- 35-44 years (OR: 3.72, CI: 1.75-6.89), 45-54 years (OR: 5.98, CI: 2.81-12.7), 55-65 years (OR: 5.13, CI: 2.42-10.9), and >65 years (OR: 4.77, CI: 2.24-10.1). In terms of provider specialty (N=36,852), being seen by a Psychiatrist as opposed to a PMD remained significantly associated with increased odds of MAUD receipt with OR: 1.25 (CI:

1.11-1.41). There was no significant difference in the odds of pharmacotherapy receipt for those subjects seen by Primary Care Nurse Practitioners or Physician Assistants compared with PMD.

In examining those comorbidities in the multivariable regression for those subjects evaluated by a provider of interest (N=36,852), alcohol-related liver disease was associated with a decreased odds of MAUD receipt (OR: 0.22, CI: 0.05-0.88). No other medical comorbidity was a significant correlate for MAUD receipt in the multivariable regression. Only cannabis use disorders were a significant comorbid SUD in the multivariable regression and were associated with decreased odds of receipt (OR: 0.46, CI: 0.31-0.67). With respect to comorbid health diagnoses, only two were associated with MAUD receipt, with an increased odds of receipt for major depressive disorder (OR: 1.19, CI: 1.01-1.41) and anxiety disorders (OR: 1.41, CI: 1.21-1.64). When examining only those patients with a diagnosis of alcohol dependence who were evaluated by a provider of interest, only male sex (OR: 0.73, CI: 0.63-0.86), anxiety disorders (OR: 1.32, CI: 1.02-1.71), and post-traumatic stress disorder (OR 3.03, CI: 1.46-6.31) were significant correlates of MAUD receipt in our multivariable model (Table 4).

4 Discussion

Using a large insurance claims database that includes claims from 350 private sector payers, we found a 3.3% prevalence of AUD pharmacotherapy prescription among individuals with a diagnosis of AUD. While this prevalence was higher (9.3%) when we restricted our sample to individuals with a diagnosis of alcohol dependence, the prevalence was still low overall at under 10%. Our study adds to the evidence base that MAUD is an underutilized therapeutic modality even in an insured patient population. Prescription prevalence in our study was similar to the previously published studies in the VA at 2.8% in 2006 (Harris et al., 2010), 3.2% in 2009 (Harris et al., 2012), and 3.2% for those HCV-negative patients with positive AUDIT-C scores (Owens et al., 2018).

When examining demographic correlates of MAUD, male sex was associated with decreased MAUD receipt in our multivariable model. Despite higher rates of current alcohol consumption, number of alcoholic drinks consumed per day (Griswold et al., 2018), lifetime AUD, severe AUD (Grant et al., 2015), and deaths attributable to alcohol (Griswold et al., 2018) in men, male patients in our study were less likely (OR=0.68) to receive MAUD. These results are similar to previous data suggesting higher odds of MAUD prescribing in women (Harris et al., 2012, 2010).

In our study, the adjusted odds of MAUD receipt were lowest in the 18-34 age group, followed by the 35-44 age group (OR=3.72), the 65+ age group (OR=4.77), and highest in the 45-54 and 55-64 age groups (OR=5.13 and 5.98). The lower rates of MAUD prescribing in younger age groups are similar to previous studies (Harris et al., 2012) despite significantly higher odds in younger age groups of overall and severe AUD in a 12-month period (Grant et al., 2015). The 65+ age group has significantly higher OR of pharmacotherapy than the 18-34 group and has similar odds to the other age groups in contrast to previous studies showing lower odds in the elderly compared with those of

middle age (Harris et al., 2012, 2010; Oldfield et al., 2020). While the confidence intervals are wide due to the low prevalence of MAUD overall, this finding may be a unique property of those subjects with private insurance and may suggest that prescribing prevalence is not as underestimated as previously predicted in the elderly when specifically the privately insured are evaluated. As our study is not able to differentiate between initiation of MAUD and retention, one possible explanation for this finding is that the 65+ age group has had more time on the basis of their greater age to be retained in treatment, although previous studies note that rates of retention in AUD treatment are low (Kraemer et al., 2019; Oldfield et al., 2020). These factors that allow the privately insured elderly to have similar odds of MAUD receipt to those in middle age brackets in contrast to other populations, such as those in the VA, require further study.

Previous data has demonstrated higher rates of MAUD receipt in patients with comorbid SUDs in HCV-positive patients but not in HIV-positive patients (Frost et al., 2019). While our unadjusted data showed higher frequencies of MAUD prescription in patients with comorbid opioid and benzodiazepine use disorders, rates were not significantly greater after adjusting for demographics, provider specialties, and other comorbidities. In our multivariable model, cannabis use disorder was the only comorbid SUD correlate with 0.46 times the odds of MAUD receipt. Considering that cannabis use disorders have been shown to be associated with increased odds of AUD (Kerridge et al., 2018), patients with this comorbid SUD may represent a neglected subgroup of patients with AUD.

Similarly, alcohol-related liver disease was the only medical comorbidity that was a correlate of AUD pharmacotherapy receipt (OR=0.22). This low odds of receipt is likely partially accounted for by the fact that both disulfiram and naltrexone have contraindications in the setting of liver disease. Further research is therefore needed for effective pharmacotherapeutic options in patients with alcohol-related liver disease. Baclofen can be used for AUD in alcohol-related liver disease, but results are mixed, and it is not currently FDA approved for this indication (Reus et al., 2018).

Provider-level data demonstrated that those patients who were evaluated by Psychiatrists were more likely to have received a prescription for MAUD than those patients evaluated by a PMD only. In contrast to schizophrenia and bipolar disorder, which had increased odds of MAUD receipt in the unadjusted analysis but not in the adjusted analysis, Psychiatry evaluation may be the greater driver of increased MAUD receipt in those patients with certain psychiatric comorbidities. Previous studies (Mark et al., 2009; Martinez et al., 2016) have similarly demonstrated higher uptake of MAUD among Psychiatrists despite the fact that MAUD in the primary care setting is effective (O'Malley et al., 2003). Various beliefs behind lower uptake among primary care providers have been cited in studies particularly lack of training and expertise, decreased confidence in the efficacy of MAUD, and need for specialty treatment for successful patient outcomes (Martinez et al., 2016; Williams et al., 2018). Addressing these barriers may be beneficial in leading towards increased MAUD prescribing in the primary care setting so as to expand services to those patients in need.

In our multivariable model, patients evaluated by Psychologists and by Addiction Treatment Specialists (which included non-prescribing counselors and detoxification facilities) had

decreased odds of MAUD receipt (OR=0.68 and 0.86, respectively). As these two provider categories have non-prescribing members, patients who opted for psychosocial treatment only could explain decreased rates of pharmacotherapy prescription among those who engaged in care with these provider types. Nonetheless, given that the American Psychiatric Association endorses MAUD specifically for moderate and severe AUD (Reus et al., 2018), it remains important that these patients be evaluated for pharmacotherapy.

Certain limitations exist to our study. While our study attempted to capture a large population through the use of a broad range of ICD-9-CM codes specific to AUD, the accuracy of our dataset is limited to the accuracy for which ICD-9-CM codes are applied in clinical practice. In addition, our assessment of medical comorbidities directly attributable to chronic AUD may have been limited by lack of specificity in coding (e.g., a subject with alcohol-induced gastritis being coded with an unspecified gastritis rather than alcohol-related gastritis). Furthermore, we cannot establish a causal link between provider specialty and prescription of MAUD. The available provider-level data does not specify from which specialty a medication was prescribed or the number of outpatient encounters an individual patient had with any given specialty. Our data, nonetheless, lays the framework for future research using a practice-based analysis among an insured patient population.

Our study only evaluated receipt of FDA-approved pharmacotherapies and did not assess off-label use of medications for AUD. Thus our findings may underestimate the prevalence of prescription of MAUD. Recent studies which included topiramate as a MAUD reported marginally higher prescription rates for MAUD (Frost et al., 2019; Owens et al., 2018; Rubinsky et al., 2015). Finally, given that our study was based on insurance claims, reasons for prescription or lack of prescription of MAUD are not available, and medical, personal or financial barriers to MAUD receipt could not be assessed. While our study removes access to insurance as a limitation, financial implications remain, particularly for those with health plans in which MAUD is on a higher tier. This study is also focused on subjects with private insurance and correlates of MAUD receipt may not be generalizable to those who have access to treatment through public insurance or self-pay.

5 Conclusion

The high prevalence of AUD combined with the comorbidities and consequences associated with its use make effective treatment essential to optimizing individual and public health. Despite the availability of effective pharmacotherapy, our data demonstrates that the frequency of MAUD receipt remains low among commercially insured individuals. As pharmacotherapy remains one of the major tools clinicians have for AUD, interventions that increase penetrance of these therapies into clinical practice will be paramount for more patients to benefit from their treatment effect.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

Role of funding source: Dr. Rittenberg has nothing to declare. Dr. Hines has nothing to declare. Dr. Alvanzo has nothing to declare. Dr. Chander receives funding from NIAAA K24 AA027483.

References

Armed Forces Health Surveillance Center, 2011. Alcohol-related diagnoses, active component, U.S. Armed Forces, 2001-2010. MSMR 18, 9–13.

Baliunas D, Rehm J, Irving H, Shuper P, 2010. Alcohol consumption and risk of incident human immunodeficiency virus infection: A meta-analysis. Int. J. Public Health 55, 159–166. 10.1007/s00038-009-0095-x [PubMed: 19949966]

Baser O, Chalk M, Rawson R, Gastfriend DR, 2011. Alcohol dependence treatments: comprehensive healthcare costs, utilization outcomes, and pharmacotherapy persistence. Am. J. Manag. Care 17 Suppl 8, 222–234. [PubMed: 21504258]

Bouza C, Angeles M, Magro A, Munoz A, Amate JM, 2004. Efficacy and safety of naltrexone and acamprosate in the treatment of alcohol dependence: a systematic review. Addiction 99, 811–28. 10.1111/j.1360-0443.2004.00763.x [PubMed: 15200577]

Chick J, 1999. Safety issues concerning the use of disulfiram in treating alcohol dependence. Drug Saf. 20, 427–35. 10.2165/00002018-199920050-00003 [PubMed: 10348093]

Fiellin DA, Reid MC, O'Connor PG, 2000. Outpatient management of patients with alcohol problems. Ann. Intern. Med 133, 815–827. 10.7326/0003-4819-133-10-200011210-00015 [PubMed: 11085845]

Frost MC, Matson TE, Tsui JI, Williams EC, 2019. Influence of comorbid drug use disorder on receipt of evidence-based treatment for alcohol use disorder among VA patients with alcohol use disorder and Hepatitis C and/or HIV. Drug Alcohol Depend. 194, 288–295. 10.1016/j.drugalcdep.2018.10.008 [PubMed: 30469100]

Grant BF, Goldstein RB, Saha TD, Patricia Chou S, Jung J, Zhang H, Pickering RP, June Ruan W, Smith SM, Huang B, Hasin DS, 2015. Epidemiology of DSM-5 alcohol use disorder results from the national epidemiologic survey on alcohol and related conditions III. JAMA Psychiatry 72, 757–766. 10.1001/jamapsychiatry.2015.0584 [PubMed: 26039070]

Griswold MG, Fullman N, Hawley C, Arian N, et al., 2018. Alcohol use and burden for 195 countries and territories, 1990-2016: A systematic analysis for the Global Burden of Disease Study 2016. Lancet 392, 1015–1035. 10.1016/S0140-6736(18)31310-2 [PubMed: 30146330]

Harris AHS, Kivlahan DR, Bowe T, Humphreys KN, 2010. Pharmacotherapy of alcohol use disorders in the veterans health administration. Psychiatr. Serv 61, 392–398. 10.1176/ps.2010.61.4.392 [PubMed: 20360279]

Harris AHS, Oliva E, Bowe T, Humphreys KN, Kivlahan DR, Trafton JA, 2012. Pharmacotherapy of alcohol use disorders by the Veterans Health Administration: patterns of receipt and persistence. Psychiatr. Serv 63, 679–85. 10.1176/appi.ps.201000553 [PubMed: 22549276]

Jonas DE, Amick HR, Feltner C, Bobashev G, Thomas K, Wines R, Kim MM, Shanahan E, Gass CE, Rowe CJ, Garbutt JC, 2014. Pharmacotherapy for adults with alcohol use disorders in outpatient settings: A systematic review and meta-analysis. JAMA - J. Am. Med. Assoc 311, 1889–1900. 10.1001/jama.2014.3628

Kerridge BT, Pickering R, Chou P, Saha TD, Hasin DS, 2018. DSM-5 cannabis use disorder in the National Epidemiologic Survey on Alcohol and Related Conditions-III: Gender-specific profiles. Addict. Behav 76, 52–60. 10.1016/j.addbeh.2017.07.012 [PubMed: 28755613]

Kraemer KL, McGinnis KA, Fiellin DA, Skanderson M, Gordon AJ, Robbins J, Zickmund S, Bryant K, Korthuis PT, 2019. Low levels of initiation, engagement, and retention in substance use disorder treatment including pharmacotherapy among HIV-infected and uninfected veterans. J. Subst. Abuse Treat 103, 23–32. 10.1016/j.jsat.2019.05.007 [PubMed: 31229189]

Mark TL, Kassed CA, Vandivort-Warren R, Levit KR, Kranzler HR, 2009. Alcohol and opioid dependence medications: Prescription trends, overall and by physician specialty. Drug Alcohol Depend. 99, 345–349. 10.1016/j.drugalcdep.2008.07.018 [PubMed: 18819759]

Martinez CP, Vakkalanka P, Ait-Daoud N, 2016. Pharmacotherapy for alcohol use disorders: Physicians' perceptions and practices. Front. Psychiatry 7, 1–6. 10.3389/fpsyt.2016.00182 [PubMed: 26903886]

McCarty D, Gu Y, Renfro S, Baker R, Lind BK, McConnell KJ, 2018. Access to treatment for alcohol use disorders following Oregon's health care reforms and Medicaid expansion. J. Subst. Abuse Treat 94, 24–28. 10.1016/j.jsat.2018.08.002 [PubMed: 30243413]

Mokdad AH, Marks JS, Stroup DF, Gerberding JL, 2004. Actual Causes of Death in the United States, 2000. J. Am. Med. Assoc 291, 1238–1245. 10.1001/jama.291.10.1238

O'Malley SS, Rounsaville BJ, Farren C, Namkoong K, Wu R, Robinson J, O'Connor PG, 2003. Initial and maintenance naltrexone treatment for alcohol dependence using primary care vs specialty care: A nested sequence of 3 randomized trials. Arch. Intern. Med 163, 1695–1704. 10.1001/archinte.163.14.1695 [PubMed: 12885685]

Oldfield BJ, McGinnis KA, Edelman EJ, Williams EC, Gordon AJ, Akgiin K, Crystal S, Fiellin LE, Gaither JR, Goulet JL, Korthuis PT, Marshall BDL, Justice AC, Bryant K, Fiellin DA, Kraemer KL, 2020. Predictors of initiation of and retention on medications for alcohol use disorder among people living with and without HIV. J. Subst. Abuse Treat 109, 14–22. 10.1016/j.jsat.2019.11.002 [PubMed: 31856946]

Owens MD, Ioannou GN, Tsui JL, Edelman JE, Greene PA, Williams EC, 2018. Receipt of alcohol-related care among patients with HCV and unhealthy alcohol use. Drug Alcohol Depend. 188, 79–85. 10.1016/j.drugalcdep.2018.03.047 [PubMed: 29754030]

Praud D, Rota M, Rehm J, Shield K, Zatoński W, Hashibe M, La Vecchia C, Boffetta P, 2016. Cancer incidence and mortality attributable to alcohol consumption. Int. J. Cancer 138, 1380–1387. 10.1002/ijc.29890 [PubMed: 26455822]

Rehm J, Room R, Graham K, Monteiro M, Gmel G, Sempos CT, 2003. The relationship of average volume of alcohol consumption and patterns of drinking to burden of disease: an overview. Addiction 98, 1209–1228. 10.1046/j.1360-0443.2003.00467.x [PubMed: 12930209]

Reif S, Horgan CM, Hodgkin D, Matteucci A-M, Creedon TB, Stewart MT, 2016. Access to Addiction Pharmacotherapy in Private Health Plans. J. Subst. Abuse Treat 66, 23–9. 10.1016/j.jsat.2016.03.001 [PubMed: 27211993]

Reus VI, Fochtmann LJ, Bukstein O, Eyler AE, Hilty DM, Horvitz-Lennon M, Mahoney J, Pasic J, Weaver M, Wills CD, McIntyre J, Kidd J, Yager J, Hong S-H, 2018. The American Psychiatric Association Practice Guideline for the Pharmacological Treatment of Patients With Alcohol Use Disorder. Am. J. Psychiatry 175, 86–90. 10.1176/appi.ajp.2017.1750101 [PubMed: 29301420]

Rubinsky AD, Chen C, Batki SL, Williams EC, Harris AHS, 2015. Comparative utilization of pharmacotherapy for alcohol use disorder and other psychiatric disorders among U.S. Veterans Health Administration patients with dual diagnoses. J. Psychiatr. Res 69, 150–157. 10.1016/j.jpsychires.2015.07.016 [PubMed: 26343607]

Sacks JJ, Gonzales KR, Bouchery EE, Tomedi LE, Brewer RD, 2015. 2010 National and State Costs of Excessive Alcohol Consumption. Am. J. Prev. Med 49, e73–e79. 10.1016/j.amepre.2015.05.031 [PubMed: 26477807]

Shield KD, Parry C, Rehm J, 2013. Chronic diseases and conditions related to alcohol use. Alcohol Res. 35, 155–73. [PubMed: 24881324]

Substance Abuse and Mental Health Services Administration, 2014. Results From the 2013 National Survey on Drug Use and Health: Summary of National Findings, NSDUH Series H-48, HHS Publication No. (SMA) 14-4863. Substance Abuse and Mental Health Services Administration, Rockville, MD, pp. 2014. (Accessed 26 September 2019). https://www.samhsa.gov/data/sites/default/files/NSDUHresultsPDFWHTML2013/Web/NSDUHresults2013.pdf.

Substance Abuse and Mental Health Services Administration and National Institute on Alcohol Abuse and Alcoholism, 2015. Medication for the Treatment of Alcohol Use Disorder: A Brief Guide, HHS Publication No. (SMA) 15-4907. Substance Abuse and Mental Health Services Administration, Rockville, MD, pp. 2015. (Accessed 26 September 2019). https://store.samhsa.gov/sites/default/files/d7/priv/sma15-4907.pdf.

Williams EC, Achtmeyer CE, Young JP, Berger D, Curran G, Bradley KA, Richards J, Siegel MB, Ludman EJ, Lapham GT, Forehand M, Harris AHS, 2018. Barriers to and Facilitators of Alcohol

Use Disorder Pharmacotherapy in Primary Care: A Qualitative Study in Five VA Clinics. J. Gen. Intern. Med 33, 258–267. 10.1007/s11606-017-4202-z [PubMed: 29086341]

Williams EC, Gupta S, Rubinsky AD, Glass JE, Jones-Webb R, Bensley KM, Harris AHS, 2017a. Variation in receipt of pharmacotherapy for alcohol use disorders across racial/ethnic groups: A national study in the U.S. Veterans Health Administration. Drug Alcohol Depend. 178, 527–533. 10.1016/j.drugalcdep.2017.06.011 [PubMed: 28728114]

Williams EC, Lapham GT, Shortreed SM, Rubinsky AD, Bobb JF, Bensley KM, Catz SL, Richards JE, Bradley KA, 2017b. Among patients with unhealthy alcohol use, those with HIV are less likely than those without to receive evidence-based alcohol-related care: A national VA study. Drug Alcohol Depend. 174, 113–120. 10.1016/j.drugalcdep.2017.01.018 [PubMed: 28324813]

Williams EC, Rubinsky AD, Lapham GT, Chavez LJ, Rittmueller SE, Hawkins EJ, Grossbard JR, Kivlahan DR, Bradley KA, 2014. Prevalence of clinically recognized alcohol and other substance use disorders among VA outpatients with unhealthy alcohol use identified by routine alcohol screening. Drug Alcohol Depend. 135, 95–103. 10.1016/j.drugalcdep.2013.11.016 [PubMed: 24360928]

Winslow BT, Onysko M, Hebert M, 2016. Medications for Alcohol Use Disorder. Am. Fam. Physician 93, 457–65. 10.1001/jama.2014.10161 [PubMed: 26977830]

Highlights

- Among medically insured patients, pharmacotherapy for alcohol use disorder is rare
- Patients who are male, younger, or have liver disease have lower odds of receipt
- Patients with comorbid cannabis use disorders have lower odds of receipt
- Psychiatry evaluation correlates with increased patient receipt

Table 1:

Subject population demographics and AUD pharmacotherapy receipt by characteristics

Characteristic	Total sample		Received pharmacotherapy			
			No		Yes	
	N	%	N	%	N	%
All subjects	123,355	100	119,281	96.7	4074	3.3
Sex						
Male	79,571	64.5	77,279	97.1	2,292	2.9
Female	43,784	35.5	42,002	95.9	1,782	4.1
Age, years						
18-34	5,331	4.3	5,308	99.6	23	0.4
35-44	50,858	41.2	49,746	97.8	1,112	2.2
45-54	21,770	17.7	20,756	95.3	1,014	4.7
55-65	26,281	21.3	25,155	95.7	1,126	4.3
>65	19,115	15.5	18,316	95.8	799	4.2
Provider specialty *						
Primary care physician (PMD)	13,959	11.3	13,217	94.7	742	5.3
Primary care NP	557	0.45	527	94.6	30	5.4
Primary care PA	276	0.22	260	94.2	16	5.8
Psychiatry MD	7,928	6.4	7,416	93.5	512	6.5
Psychiatry NP	122	0.10	113	92.6	9	7.4
Psychologist	2,941	2.4	2,840	96.6	101	3.4
Addiction Treatment Specialist **	11,069	9.0	10,622	96.0	447	4.0

* Includes a subsample of subjects seen in selected settings of interest (N=36,852)

** Compromised of medical and non-medical counselors who focus on SUDs, including “Mental Health/Chemical Dependency not elsewhere classified”, “Mental Health facilities”, “Chemical Dependency Treatment Center”, “Mental Health/Chemical Dependency Day Care”, or “Residential Treatment Center”).

Table 2:

Subject comorbidities and AUD pharmacotherapy receipt by comorbidities

	Total sample			Received pharmacotherapy				
				No			Yes	
Comorbidity	**N**	**%**		**N**	**%**		**N**	**%**
All subjects	123,355	100		119,281	96.7		4,074	3.3
Comorbid medical sequelae of AUD								
Acute alcohol intoxication	357	0.29		343	96.1		14	3.9
Alcohol withdrawal & related neuropsychiatric sequelae	240	0.19		227	94.6		13	5.4
Alcoholic liver disease	331	0.27		323	97.6		8	2.4
Alcoholic cardiomyopathy	9	0.010		9	100		0	0
Alcoholic gastritis	72	0.060		72	100		0	0
Alcoholic neuropathy	21	0.020		21	100		0	0
Personal history of alcoholism	22	0.020		20	90.9		2	9.1
Comorbid direct alcohol-attributable medical diseases								
Chronic pancreatitis	40	0.030		40	100		0	0
Liver cirrhosis & associated sequelae	212	0.17		209	98.6		3	1.4
HIV	38	0.03		36	97.7		2	5.3
Comorbid mental health diagnoses								
Schizophrenic disorders	48	0.040		45	93.7		3	6.3
Major depressive disorders	5,238	4.3		4,939	94.3		299	5.7
Bipolar affective disorders	736	0.60		685	93.1		51	6.9
Anxiety disorders	6,001	4.9		5,642	94.0		359	6.0
Mood disorders NOS	711	0.58		671	94.4		40	5.6
Psychosis NOS	268	0.22		266	99.3		2	0.75
Personality disorders	121	0.10		115	95.0		6	5.0
Post-traumatic stress disorder	543	0.44		510	93.9		33	6.1
Comorbid substance use disorders								
Opioid use disorders	5,506	4.5		5,274	95.8		232	4.2
Benzodiazepine & sedative use disorders	1,306	1.1		1,238	94.8		68	5.2
Cocaine use disorders	1,757	1.4		1,717	97.7		40	2.8
Cannabis use disorders	5,940	4.8		5,867	98.8		73	1.2
Amphetamine use disorders	805	0.65		790	98.1		15	1.9
Polysubstance use disorders	507	0.41		485	95.7		22	4.3
Tobacco use disorders	4,406	3.6		4,300	97.6		106	2.4

Drug Alcohol Depend. Author manuscript; available in PMC 2021 September 01.

Table 3

*: Unadjusted and adjusted odds ratios associated with receipt of pharmacotherapy

Characteristic/Comorbidity	Unadjusted odds ratio	95% Confidence interval		Adjusted odds ratio**	95% Confidence interval**	
		Lower	Upper		Lower	Upper
Sex						
Male vs. Female	0.70	0.66	0.74	0.68	0.55	0.84
Age, years						
18-34 (Reference)	1	1	1			
35-44	5.16	3.41	7.80	3.72	1.75	7.89
45-54	11.3	7.45	17.1	5.98	2.81	12.7
55-65	10.3	6.83	15.6	5.13	2.42	10.9
>65	10.1	6.64	15.3	4.77	2.24	10.1
Provider specialty						
Primary care physician (PMD, Reference)	1	1	1			
Primary care NP	1.01	0.70	1.48	1.00	0.69	1.46
Primary care PA	1.10	0.66	1.83	1.13	0.68	1.89
Psychiatry MD	1.23	1.10	1.38	1.25	1.11	1.41
Psychiatry NP	1.42	0.72	2.81	1.33	0.67	2.65
Psychologist	0.63	0.51	0.78	0.68	0.55	0.84
Addiction treatment specialist	0.75	0.57	0.85	0.86	0.76	0.97
Comorbid medical sequelae of AUD						
Acute alcohol intoxication	1.20	0.70	2.04			
Alcohol withdrawal & related neuropsychiatric sequelae	1.68	0.96	2.94			
Alcohol-related liver disease	0.73	0.36	1.46	0.22	0.05	0.88
Personal history of AUD	2.93	0.68	12.5			
Comorbid direct alcohol-attributable medical diseases						
Liver cirrhosis & associated sequelae	0.42	0.13	1.31			
HIV	1.64	0.40	6.78			
Comorbid mental health diagnoses						

Characteristic/Comorbidity	Unadjusted odds ratio	95% Confidence interval		Adjusted odds ratio**	95% Confidence interval**	
		Lower	Upper		Lower	Upper
Schizophrenic disorders	1.95	0.61	6.29			
Major depressive disorders	1.83	1.63	2.07	1.19	1.01	1.41
Bipolar affective disorders	2.20	1.65	2.93			
Anxiety disorders	1.95	1.74	2.18	1.41	1.21	1.64
Mood disorders NOS	1.75	1.27	2.42			
Psychosis NOS	0.22	0.06	0.88			
Personality disorders	1.53	0.68	3.48			
Post-traumatic stress disorder	1.90	1.34	2.71			
Comorbid substance use disorders						
Opioid use disorders	1.31	1.14	1.50			
Benzodiazepine & sedative use disorders	1.62	1.27	2.07			
Cocaine use disorders	0.68	0.50	0.93			
Cannabis use disorders	0.35	0.28	0.45	0.46	0.31	0.67
Amphetamine use disorders	0.55	0.33	0.93			
Polysubstance use disorders	1.33	0.87	2.04			
Tobacco use disorders	0.72	0.59	0.87			

* N=123,355. Comorbidities without data for AUD pharmacotherapy receipt are omitted

** Correlates determined only for those subjects in which provider data is available (N=36,852)

Table 4:

Correlates associated with AUD pharmacotherapy receipt in patients with alcohol dependence

Characteristic/Comorbidity	Adjusted odds ratio	95% Confidence interval	
		Lower	Upper
Sex			
Male vs. Female	0.73	0.63	0.86
Comorbid mental health diagnoses			
Anxiety disorders	1.32	1.02	1.71
Post-traumatic stress disorder	3.03	1.46	6.31