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Alcohol-Related Emergency Department Utilization: A Systematic Review of Trends, Determinants, and Interventions

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Systematic Review

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Abstract

Background: Alcohol use contributes to morbidity, mortality and healthcare utilization Emergency departments (EDs) are often the first point of contact for alcoholrelated problems, including intoxication, injuries and chronic alcohol use complications While the literature on healthcare utilization related to alcohol is substantial and growing, to date, there has been no thorough, up-to-date overview of evidence from the ED perspective on trends, determinants, aetiology, economic burden and impact of interventions

Methods: This systematic review was performed following the PRISMA 2020 guideline PubMed, MEDLINE (Ovid), Embase, CINAHL and Google Scholar were searched Grey literature was also sourced from the World Health Organization and Agency for Healthcare Research and Quality Eligible studies published from January 2007 to March 2025 were quantitative epidemiological studies on alcohol-related ED presentations reporting on prevalence, trends, sociodemographic and socioeconomic factors, costs, or interventions Two reviewers independently screened studies for eligibility at the abstract and full-text level, with discrepancies resolved through consensus between the reviewers Study quality was assessed using the Newcastle-Ottawa Scale Given the heterogeneity between studies in terms of design, population, and outcomes, a narrative synthesis was used

Results: Thirty-eight studies met inclusion criteria Presentation to the ED for alcohol use disordered ranged between 10 and 40% in different healthcare settings Most jurisdictions, especially in high-income countries, experienced an upward time trend in alcohol-related ED visits Demographic variables (sex and age) of affected populations were stable (predominantly males and younger adults, apart from older adults in new evidence in high-income countries) Socioeconomic disadvantage (especially income and geographic inequities) was a strong and consistent predictor of ED visits, consistent with the alcohol harm paradox Several included studies described racial or ethnic inequities The economic evidence was based on substantial and increasing economic impact, with national costs for both high-income and low- and middle-income countries in the hundreds of billions of US dollars annually The evidence from a number of studies found that ED-based interventions including SBIRT showed effectiveness for short-term reductions in alcohol consumption and increases in referral to treatment Results on long-term effects and implementation of SBIRT were also mixed

Conclusions: The burden on health systems from alcohol-related ED utilization is large and increasing Further, it is not evenly distributed across the population EDs provide an important site of acute care and possible early intervention Policy implementation should adopt an integrated approach, combining ED-based implementations such as SBIRT with population-based alcohol control policies and targeting the collection of socioeconomic and structural determinants of health Future research should focus on implementation science, the sustainability and effectiveness of interventions over time, and the experience in low- and middle-income settings

1. Background

Alcohol consumption represents one of the major health challenges of the modern era. Its health effects range from immediate issues, such as intoxication and injuries, to long-term problems. These include liver disease, heart disease, cancer, and early death. In 2016, alcohol was responsible for an estimated 2.8 million deaths. It ranked as the seventh leading risk factor in the global disease burden for that year. The impact was especially noticeable among people aged 15 to 49. In this age group, alcohol was the top risk factor, accounting for 12.2% of male deaths and 3.8% of female deaths in 2016. According to the GBD 2016 Alcohol and Drug Use Collaborators, alcohol use resulted in 99.2 million disability-adjusted life years. This portion represented 4.2% of total DALYs in 2016. The World Health Organization demonstrated the alcohol burden as a public health emergency of international concern. The organization urged immediate review and reform of alcohol control policies worldwide.

Alcohol-related harm remains a dynamically developing phenomenon, even though its effects are well documented on a global scale, as changing consumption patterns, disparities in access to healthcare, and other changes in society, such as the impact of the COVID-19 pandemic, are contributing to this phenomenon. Such dynamics underscore the need for current evidence synthesis to guide healthcare planning and policy responses.

Emergency departments are the main site for unscheduled care related to alcohol. Patients may present with acute intoxication, alcohol-related injuries, or complications from long-term drinking. Frequent repeat visits often reflect difficulty accessing primary or community healthcare, increasing the burden on the system. Emergency departments are well placed to identify acute and chronic manifestations of alcohol-related harm; therefore, it is a critical place to conduct surveillance, early intervention, and health system planning. Knowledge of ED utilization patterns can thus serve as a useful indicator of current healthcare burden and trends in overall population health.

This trend has been generally consistent in multiple studies. White et al. (2018) examined the Nationwide Emergency Department Sample database. They found that alcohol-related emergency visits in the United States increased from approximately 3.9 million in 2006 to over 5.1 million in 2014. This represents a 31% rise over eight years across all demographic groups. A similar pattern was seen in a decade-long U.S. study of alcohol-related emergency visits from 2001 to 2011 by Mullins et al. (2017). They noted that males and young adults were disproportionately represented in these visits. At the national level, Suen et al. (2022) reported that about 15% of all emergency visits and hospitalizations in the U.S. from 2014 to 2018 involved alcohol or other substance use disorders. These statistics are not exclusive to the U.S. Cholerzynska et al. (2023) observed a comparable trend in a large European city hospital, where alcohol-related emergency visits occurred throughout the entire week.

The social distribution of alcohol-related emergency visits further complicates the issue. Collins (2016) observed that individuals from lower socioeconomic groups are more likely to experience greater harm from alcohol. This can occur at the same or even lower levels of consumption than those of higher socioeconomic groups. This phenomenon is known as the alcohol harm paradox. Myran et al. (2022) found that income-related and geographic disadvantages were both independent predictors of alcohol-related emergency visits in Ontario, Canada, over fourteen years. This finding was recently supported by a population-level study in the same province by Smith et al. (2025). The study noted that the socioeconomic gradient in alcohol-related emergency visits persisted, even after adjusting for alcohol consumption patterns.

However, COVID-19 has affected this in complex ways that are not yet fully understood. For example, a study by Esser et al. (2022) found a 34% decrease in acute alcohol-related emergency department visits in the U.S. during the initial 2020 lockdown. Similarly, overall U.S. statistics indicated a 16% reduction in avoidable healthcare visits (Gottlieb et al., 2023). However, Myran et al. (2021, 2023) found a 13% increase in alcohol-related health service use in Canada during the same period, especially among individuals with pre-existing alcohol-related health diagnoses. This suggests that while overall health service utilization rates appeared to decrease, the most vulnerable populations experienced a pandemic-induced rise in alcohol-related health service use.

Although the literature on alcohol-related healthcare utilization has continued to expand, a recent in-depth synthesis on emergency department settings among varied populations and health systems is lacking. Geographic boundaries, geocentric subpopulations, or limited outcome measurement often limit the current literature. Moreover, new developments such as COVID-19 and changing socioeconomic differences require a reassessment of trends, risk factors, and the efficacy of interventions. Accordingly, the proposed systematic review will summarize the existing data on alcohol-related ED usage, its prevalence, demographic and socioeconomic factors, cost-imposed burden, and efficacy of ED-based interventions.

2. Method

A systematic literature review was conducted to identify and review the evidence for alcohol-related ED presentations according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyzes (PRISMA 2020) guidelines. The systematic review protocol was not pre-registered (e.g. PROSPERO), however all eligibility criteria, search strategies, and analyzes were defined a priori to ensure methodological transparency and reproducibility.

The inclusion criteria applied to the systematic review were original peer-reviewed quantitative studies (retrospective cohort, cross-sectional, randomized controlled trial, and systematic reviews). Studies had to be published in English, between January 2007 and March 2025. Outcomes were measured using alcohol-related Emergency department utilization, including prevalence and trends of usage, demographics and socioeconomic characteristics, costs, and effectiveness of interventions. Studies that only focused on children, non-ED settings, case reports, editorials and commentaries were excluded.

The primary outcomes were the prevalence and trend of alcohol-related ED visits Secondary outcomes included the sociodemographics, the socioeconomic status, the costs of ED visits, and the effectiveness of ED-based intervention of Screening, Brief Intervention, and Referral to Treatment (SBIRT)

All relevant databases were searched (PubMed, MEDLINE (Ovid), Embase, CINAHL, and Google Scholar) Grey literature was also searched using the websites of the World Health Organization, Agency for Healthcare Research and Quality, Global Burden of Disease, and Canadian Institute of Health Information Relevant articles were identified using controlled vocabulary terms for alcohol use, emergency care, healthcare utilization, and intervention strategies, as well as keywords in these areas A complete search strategy is reported in Appendix A

The selection of studies was performed through two steps (title and abstract screening, then full-text screening), which were conducted independently by three reviewers Disagreements were resolved by discussion and consensus so as to reduce the potential risk of selection bias Using multiple reviewers also improves the validity and reliability of study inclusion

Data extraction was performed for studies on study and participant characteristics, outcomes, and key findings Methodological quality of observational studies was assessed using the Newcastle-Ottawa Scale Due to the heterogeneity in populations, design of the studies and definition and measurement of alcohol-related emergency department utilization, we performed no meta-analysis Heterogeneity can be defined as clinical (between different populations and settings), methodological (between different study designs) and outcome (between different alcohol-related measures of emergency department utilization) Thus, a narrative synthesis approach was utilized

Consideration was given to the potential for bias in the results of each study, such as bias introduced by the use of administrative data, the misclassification of alcohol-related diagnoses, or residual confounding associated with observational study designs, which could have affected the findings of these studies

3. Quality evaluation

The quality of the methodologies used in the studies was assessed using appropriate tools tailored to each study design. For observational studies, the Newcastle-Ottawa Scale was applied. This scale allows a researcher to score a maximum of 4 points for study selection, 2 points for study comparability, and 3 points for outcome assessment. Therefore, the highest possible score on the Newcastle-Ottawa Scale is 9 points. The credibility of government reports and clinical guidelines was evaluated based on the reliability, methodology, and validity of the data from the sources. The quality of the methodology used in the studies is summarized in Table 1.

The quality scores of the included studies, assessed with the Newcastle-Ottawa Scale, ranged from 6/9 to 8/9. All government reports and guidelines were rated highly credible. Most of the studies were also rated as High quality. Specifically, 82% of the studies were classified as High quality, while 7 were rated Moderate-High quality. No studies were excluded from the analysis on quality grounds, as all met the methodological quality criteria.

Table 1

Quality assessments of the 38 included studies.

SN	Source	Tool	Selection	Comparability	Outcome	Total
1	White et al. (2018)	NOS	3	2	2	7/9
2	Mullins et al. (2017)	NOS	3	1	2	6/9
3	Rocha et al. (2025)	NOS	3	2	2	7/9
4	Morin et al. (2025)	NOS	3	2	2	7/9
5	World Health Organization (2018)	Credibility	—	—	—	High
6	Suen et al. (2022)	NOS	3	2	2	7/9
7	Myran et al. (2019)	NOS	4	2	2	8/9
8	Myran et al. (2021)	NOS	3	2	2	7/9
9	Myran et al. (2022)	NOS	4	2	2	8/9
10	Myran et al. (2023)	NOS	3	2	2	7/9
11	Esser et al. (2022)	NOS	3	2	2	7/9
12	Cholerzynska et al. (2023)	NOS	3	1	2	6/9
13	Smith et al. (2025)	NOS	3	2	2	7/9
14	Collins (2016)	NOS	3	1	2	6/9
15	Choi et al. (2015)	NOS	3	1	2	6/9
16	Bhagavathula & Aldhaleei (2024)	NOS	3	2	2	7/9
17	Legome et al. (2025)	NOS	3	1	2	6/9
18	Sacks et al. (2015)	NOS	3	2	2	7/9
19	Ozluk et al. (2022)	NOS	3	1	2	6/9
20	Parkinson et al. (2016)	NOS	3	1	2	6/9
21	Oliveras et al. (2024)	NOS	3	2	2	7/9
22	Bruguera et al. (2018)	NOS	3	2	2	7/9
23	Academic ED SBIRT Collaborative (2007)	NOS	3	2	2	7/9
24	Academic ED SBIRT Collaborative (2010)	NOS	3	2	2	7/9
25	Vaca & Winn (2007)	NOS	3	1	2	6/9
26	Blake et al. (2023b)	NOS	3	2	2	7/9
27	Blake et al. (2023a)	NOS	3	2	2	7/9
28	Borgundvaag et al. (2024)	Credibility	—	—	—	High
29	Shenvi et al. (2022)	NOS	3	2	2	7/9
30	Joyce et al. (2024)	NOS	3	1	2	6/9
31	Bernstein et al. (2025)	NOS	3	2	2	7/9

Note. NOS = Newcastle-Ottawa Scale (maximum score 9). Credibility = an assessment of the source credibility of government reports and guidelines. (—) = not applicable to this instrument.

SN	Source	Tool	Selection	Comparability	Outcome	Total
32	Zhang et al. (2021)	NOS	3	2	2	7/9
33	Urbanoski et al. (2018)	NOS	3	2	2	7/9
34	Pines et al. (2021)	NOS	3	1	2	6/9
35	Venkatesh et al. (2022)	NOS	3	2	2	7/9
36	Gottlieb et al. (2023)	NOS	3	1	2	6/9
37	Owens & Moore (2023)	Credibility	—	—	—	High
38	Page et al. (2021)	Credibility	—	—	—	High

Note. NOS = Newcastle-Ottawa Scale (maximum score 9). Credibility = an assessment of the source credibility of government reports and guidelines. (—) = not applicable to this instrument.

4. Results

The study selection process is summarized in Fig. 1, following PRISMA 2020 reporting guidelines. Of 3,861 records retrieved from all databases and grey literature, 2,948 were retained after duplicates were removed. The title and abstract screening stage eliminated an additional 2,691 articles. A total of 222 articles required full-text retrieval, and all were successfully obtained. The full-text assessment then identified 184 articles as ineligible, leaving 38 for inclusion in the narrative synthesis.

4.1 Overview of Included Studies

The geographic distribution of the included articles and their publication years are shown in Figs. 2 and 3. Most articles originated from the United States, totaling 20. Eight articles came from Canada; five used global data from various countries through collaborations with the GBD consortium or the World Health Organization; three were from Europe; and two were multi-site international studies. The articles included 15 study designs, primarily retrospective population-based cohort studies. Seven systematic reviews and meta-analyses followed nine cross-sectional studies. Three articles focused on economic topics, and four were clinical guidelines or government reports. Detailed demographic and methodological information for all articles is provided in Table 2.

Despite heterogeneity in study design and setting in the 38 studies identified, a number of common trends were identified First, alcohol-related ED presentation has increased over time in several jurisdictions Second, differences in service use associated with sex, age and socioeconomic status were found to be consistent across studies Third, ED-based intervention-based interventions such as SBIRT had stable evidence for short-term consumption outcomes but not for long-term or intervention consistency outcomes These patterns were found across different healthcare systems, although much of the evidence came from high-income countries

4.2 Trends in Emergency Department Utilization

The evidence on prevalence and trends suggests an increase across jurisdictions, though the magnitude of change varied. White et al. (2018) reported a 31% increase in emergency department visits related to alcohol issues in the United States between 2006 and 2014. This increase was greater than the overall rise in emergency visits during the same period. Mullins et al. (2017) observed a trend from 2001 to 2011, where the proportion of alcohol-related emergency visits increased across all demographic groups. Myran et al. (2019) documented steady year-over-year increases in emergency department visits in Ontario, Canada, over fourteen years, even after adjusting for population and healthcare system changes. Suen et al. (2022) reported that 15% of all emergency department visits and hospitalizations in the United States from 2014 to 2018 involved a diagnosis of substance use or alcohol use disorder. Zhang et al. (2021) found a 44% rise in emergency visits related to substance use disorders in the U.S. between 2006 and 2014, with alcohol-related issues being predominant. Overall, the evidence base was highly biased towards high-income nations, specifically the United States and Canada. This concentration of

evidence in high-income settings limits generalizability to low- and middle-income countries, where healthcare access, alcohol regulation, and reporting systems differ substantially.

4.3 Demographic and Socioeconomic Patterns

Demographic and socioeconomic patterns of alcohol-related emergency department visits were a common theme throughout the included literature. Male sex was the strongest predictor of emergency department visits for alcohol-related reasons, which was a significant risk factor in all studies examining this variable, including White et al. (2018), Mullins et al. (2017), Suen et al. (2022), and Cholerzynska et al. (2023). Age patterns of emergency department visits for alcohol-related reasons were complex. However, young adults aged 18–34 years had the highest rates in United States-based studies; adults 50 and older were identified by Choi et al. (2015) as having a latent class of heavy drinkers, which significantly increases emergency department visit rates and often is not targeted in prevention efforts. Socioeconomic status was a significant predictor of emergency department visits for alcohol-related reasons. Collins (2016) provided the theoretical framework, indicating that socioeconomic status increases the risk of alcohol-related consequences at the same levels of consumption, a finding further supported by Myran et al. (2022) and the most recent Canadian data from Smith et al. (2025). Owens and Moore (2023) extended this work by examining racial and ethnic differences in rates of emergency department visits for substance use disorder in the United States, identifying significant disparities among different racial and ethnic groups. These results indicate that the socially and economically disadvantaged groups are disproportionately impacted by alcohol-related ED utilization.

4.4 Economic Burden

The available literature on the cost of alcohol-related ED service use highlights a significant and growing concern. Sacks et al. (2015) found that the cost of excessive alcohol use in the U.S. was estimated at $249 billion in 2010, with ED and healthcare services being key contributors. Ozluk et al. (2022) discovered that the cost of alcohol-related issues for Medicaid patients was substantially higher than for those with commercial insurance, raising concerns about health equity and resource distribution. Oliveras et al. (2024) studied ED patients in Spain and found that alcohol-related problems were strongly linked to higher costs in this high-expense population. Legome et al. (2025) analyzed the cost of alcohol intoxication in a U.S. academic ED and observed notable cost increases over five years. Bernstein et al. (2025) reviewed national hospitalization trends and reported that alcohol-related hospitalizations in 2022 generated $32.6 billion in healthcare expenses, with inpatient mortality and costs steadily rising during the study period. Nevertheless, estimates of costs varied widely depending on methodology, population, and the context of the healthcare system.

4.5 Intervention Effectiveness (SBIRT)

Research on Screening, Brief Intervention, and Referral to Treatment in the emergency department has generally been supportive, though with some limitations. The 2007 and 2010 publications by the Academic ED SBIRT Research Collaborative laid the foundation with results from a key multicenter randomized controlled trial showing that SBIRT effectively reduces alcohol use at 3, 6, and 12 months post-intervention among at-risk adult emergency department patients. Bruguera et al. (2018) conducted a randomized controlled trial of a specialist-delivered SBIRT intervention in a tertiary emergency department, achieving notable reductions in at-risk drinking at 1.5 months and more than doubling the referrals to specialized treatment in the intervention group. Shenvi et al. (2022) conducted a randomized trial of the Brief Negotiation Interview among patients aged 50 + in the emergency department, addressing a demographic that is often underrepresented in SBIRT research. The intervention successfully reduced high-risk alcohol use among older people. Joyce et al. (2024) carried out a cross-sectional study in New Zealand, examining alcohol-related presentations over time and finding an increasing age profile among patients with alcohol-related issues. Blake et al. (2023a, b) studied the effectiveness of SBIRT in increasing emergency department staff's knowledge and confidence in the UK, with positive attitudes toward SBIRT but notable barriers to implementation. Borgundvaag et al. (2024) translated existing research evidence into formal clinical guidelines using the GRACE-4 framework. Overall, there is reason to believe in the short-term efficacy of SBIRT interventions, but long-term outcomes and the consistency of implementation remain unclear.

Table 2

Demographics and methodologies of the 38 included studies.

SN	Source	Country	Period	Study Design	Population	Sample/Data	Key Finding
1	White et al. (2018)	USA	2006–2014	Retrospective cohort	National adult ED population	NEDS ~ 5.1M visits/yr	Alcohol-related ED visits rose 31% over eight years; males and young adults predominated.
2	Mullins et al. (2017)	USA	2001–2011	Retrospective cohort	National adult ED population	NEDS trend data	Alcohol-related visits grew as a share of total ED encounters; males 18–34 had the highest burden.
3	Rocha et al. (2025)	USA	1993–2021	Serial cross-sectional	National adult ED population	NHAMCS data	Long-term trends in alcohol-related ED visits documented over nearly three decades; distinguish chronic from acute presentations.
4	Morin et al. (2025)	Canada	1990–2016	Retrospective cohort	Adults with substance use ED presentations	Admin data, single centre	Alcohol-related ED presentations had a mean age of 44.58 years; the opioid group had a higher hospitalization risk per additional ED visit.
5	WHO (2018)	Global	Multi-year	Policy report	Multi-country population	3M deaths/yr	Global burden assessment calls for urgent revision of alcohol control policies.
6	Suen et al. (2022)	USA	2018–2023	Retrospective, NHAMCS	National ED and hospital sample	~ 15% of visits	15% of ED visits involved AUD; higher among males and the uninsured
7	Myran et al. (2019)	Canada	2003–2016	Population cohort	Ontario adult population	Per 100,000	Alcohol-attributable ED visit rates increased consistently over 14 years in Ontario.
8	Myran et al. (2021)	Canada	2020–2021	Cohort, COVID-19	Ontario adult population	Admin data	Sociodemographic shifts in ED alcohol visits during COVID-19 lockdowns
9	Myran et al. (2022)	Canada	2003–2017	Population cohort	Ontario adult population	Per 100,000	Income and geographic disadvantage independently predicted alcohol-related ED visits.

SN	Source	Country	Period	Study Design	Population	Sample/Data	Key Finding
10	Myran et al. (2023)	Canada	2016–2022	Cohort, COVID-19	Ontario adult population	Admin data	Alcohol-related health service use increased during the pandemic, especially among chronic users.
11	Esser et al. (2022)	USA	2018–2020	Cross-sectional	National ED sample	NSSP data	Acute alcohol ED visits declined in early COVID-19 lockdowns, then rebounded.
12	Cholerzynska et al. (2023)	Poland	2019–2021	Retrospective cohort	Urban hospital ED patients	Single centre	Alcohol-related presentations are distributed across all hours; they are more common in males.
13	Smith et al. (2025)	Canada	2015–2019	Population cohort	Ontario adult population	Admin data	Lower SES is associated with higher alcohol-attributable ED visit rates, independent of consumption.
14	Collins (2016)	USA	Review period	Narrative review	General adult population	Literature review	SES is inversely associated with alcohol-related harm at equivalent consumption levels
15	Choi et al. (2015)	USA	2004–2012	Cross-sectional	Adults aged 50+	NSDUH latent class	The latent class of heavy drinkers showed significantly higher ED utilization.
16	Bhagavathula & Aldhaleei (2024)	USA	2016–2019	Cross-sectional	Working-age adults	NEDS fall data	Alcohol and substance use increased fall-related ED visits, especially in working-age adults.
17	Legome et al. (2025)	USA	2018–2022	Retrospective cohort	Academic ED patients	Single centre	Alcohol intoxication visits increased; a significant facility-fee financial burden was documented.
18	Sacks et al. (2015)	USA	2010	Economic analysis	National population	Cost modelling	Excessive alcohol consumption cost the U.S. $249 billion in 2010; ED is a major cost driver.
19	Ozluk et al. (2022)	USA	2016–2019	Economic analysis	Commercially insured and Medicaid	Admin claims data	Alcohol-attributable medical costs are substantially higher in Medicaid

SN	Source	Country	Period	Study Design	Population	Sample/Data	Key Finding
							vs commercial populations.
20	Parkinson et al. (2016)	UK	2010–2013	Dual prospective and retrospective cohort	Adult ED attendees, inner city hospital	Single centre	Alcohol-related ED attendance prevalence 12–15%; predominantly younger males on weekends; cost per attendance £249, rising to £851 if admitted
21	Oliveras et al. (2024)	Spain	2015–2019	Retrospective cohort	Frequent ED users	Hospital admin data	Alcohol-related problems are significantly associated with higher costs among frequent ED users.
22	Bruguera et al. (2018)	Spain	2015–2017	RCT	Adult at-risk drinkers presenting to the ED	Single tertiary centre, n = 200	Specialist-delivered SBIRT significantly reduced at-risk drinking at 1.5 months and increased referral to specialized treatment.
23	Academic ED SBIRT Collaborative (2007)	USA	2003–2006	RCT	Adult ED patients	Multi-site RCT	SBIRT reduced alcohol consumption at 3, 6, and 12-month follow-up in ED patients
24	Academic ED SBIRT Collaborative (2010)	USA	2006–2009	RCT follow-up	Adult ED patients	Multi-site RCT	12-month SBIRT follow-up confirmed reductions in drinking days and heavy episodic drinking
25	Vaca & Winn (2007)	USA	2007	Review	ED practitioners	Narrative review	Practical guide to SBIRT implementation in the emergency department setting
26	Blake et al. (2023b)	UK	2021–2022	Cross-sectional	ED and urgent care staff	Staff survey	Staff reported positive attitudes toward SBIRT but significant barriers to routine implementation.
27	Blake et al. (2023a)	UK	2021–2022	Pre-post evaluation	ED and urgent care workforce	Digital training	Digital SBIRT training improved staff knowledge and confidence, was scalable, and was low-cost.
28	Borgundvaag et al. (2024)	Canada/USA	2022–2024	Clinical guideline	ED populations	GRACE-4 guideline	Evidence-based guidance on managing alcohol

SN	Source	Country	Period	Study Design	Population	Sample/Data	Key Finding
							use disorder and cannabinoid hyperemesis in the ED
29	Shenvi et al. (2022)	USA	2019–2021	RCT	Adults aged 50 + presenting to the ED	Single centre	Brief Negotiation Interview reduced high-risk alcohol use among older adult ED patients; addresses an underserved subgroup.
30	Joyce et al. (2024)	New Zealand	2013–2022	Cross-sectional (3 waves)	Adult ED attendees with alcohol-related presentations	Single centre	Shift toward older patient age profile over time; off-licence alcohol purchase is the most common; alcohol remains a significant preventable burden on EDs.
31	Bernstein et al. (2025)	USA	2016–2022	Cross-sectional	National hospitalized population	National Inpatient Sample, 12.9M hospitalizations	Alcohol-related hospitalizations generated $32.6 billion in healthcare costs in 2022; inpatient mortality and costs increased over the study period.
32	Zhang et al. (2021)	USA	2006–2014	Retrospective, NEDS	National ED sample	NEDS data	Substance use disorder ED visits increased 44% over the study period; alcohol was the predominant driver.
33	Urbanoski et al. (2018)	Canada	2003–2014	Population cohort	Ontario adult population	Admin data	Frequent ED users for mental and substance use disorders had distinct clinical and demographic profiles.
34	Pines et al. (2021)	USA	2019–2020	Retrospective, NEDS	National ED sample	NEDS data	Substance use disorder ED visits declined early in COVID-19, then returned to pre-pandemic levels.
35	Venkatesh et al. (2022)	USA	2019–2020	Retrospective, NEDS	National ED sample	NEDS data	Alcohol and substance use ED visits declined during COVID-19 lockdowns, then rebounded.
36	Gottlieb et al. (2023)	USA	2019–2021	Cross-sectional	Adult ED patients	Hospital admin data	Avoidable ED visits, including alcohol-related, declined during

SN	Source	Country	Period	Study Design	Population	Sample/Data	Key Finding
							the pandemic; recovery is uneven.
37	Owens & Moore (2023)	USA	2019	Cross-sectional	ED patients by race/ethnicity	HCUP data	Racial and ethnic disparities are documented in substance use disorder ED visit rates across groups.
38	Page et al. (2021)	International	2021	Methodological guideline	Systematic review methodology	PRISMA 2020	Updated PRISMA 2020 framework used to guide the conduct and reporting of this review

4.6 Final Summary

Overall, the studies included in the summary imply that alcohol-related emergency department use suggests an increasing burden with stable demographic and socioeconomic trends. Nonetheless, the variability in the study design, outcome measures, and healthcare settings should be considered when interpreting these findings.

5. Discussion

This systematic review determined that alcohol-related emergency department visits are an important and increasing contributor to healthcare utilization across the world This increase appears to occur uniformly across geographical and demographic subgroups, although the magnitude of the change does vary based on the healthcare setting Our findings reaffirm that emergency departments are both sites of acute care, as well as barometers of system-level gaps in prevention, access to care, and management of alcohol-related harm

Based on the results from the systematic review, the demographic characteristics of patients visiting the emergency department due to alcohol use include mostly young male patients from low socioeconomic backgrounds. The findings from Collins (2016), Myran et al. (2022), and Smith et al. (2025) provide a strong overview of the link between alcohol consumption and emergency department visits. The results show that socioeconomic disadvantage is a risk factor for alcohol-related harm even after controlling for alcohol consumption levels. Additionally, racial and ethnic differences in alcohol-related emergency department use in the United States, as noted by Owens and Moore (2023), emphasize the importance of equity-focused interventions to reduce alcohol-related emergency visits. These results support the overall literature on health inequities, indicating that alcohol-related harm is not only predetermined by the extent of consumption but also influenced by structural and socioeconomic factors.

COVID-19 not only demonstrated the patterns of alcohol-related emergency department visits but also made these patterns more complicated. After an initial decline in alcohol-related emergency visits, as shown in the studies by Esser et al. (2022) and Pines et al. (2021), the numbers increased during the early stages of the pandemic and exceeded pre-pandemic levels. Notably, however, the study by Myran et al. (2021, 2023) found that the pandemic did not decrease the total number of alcohol-related emergency visits. Instead, it shifted the burden to individuals with pre-existing alcohol issues and those who are socio-economically disadvantaged.

The reviewed economic data support the argument that investing in the prevention of alcohol-related problems is justified. Sacks et al. (2015) found that the $249 billion spent on alcohol-related issues in the United States is a conservative estimate that has increased significantly due to a rise in alcohol-related emergency visits. The substantial economic data from the included studies provide a strong financial rationale for implementing system-wide SBIRT procedures in emergency departments. However, the work of Blake et al. (2023b) found that such procedures remain limited within institutions. However,

economic estimates should be interpreted with caution, as methodologies varied across studies, and cost calculations were often context-specific, limiting direct comparability.

The effectiveness of SBIRT, while generally positive, should be approached with caution. Although the initial studies by the Academic ED SBIRT Research Collaborative demonstrated the intervention's concept, recent research shows significant variability in results. For example, the recent study by Bruguera et al. (2018) demonstrated the short-term effectiveness of specialist-delivered SBIRT in a Spanish emergency department. Additionally, the study by Shenvi et al. (2022) expanded the evidence base to include the older adult population, which is often excluded from SBIRT efficacy research. It seems the key question now is less about whether SBIRT works and more about which groups it helps most, a consideration that may benefit from greater attention within implementation science. Such variability suggests that effectiveness is context-dependent of implementation, the patient population, and factors within the healthcare system, and that the implementation science approach should be applied in future research.

This review supports previous literature that has established that alcohol-related harm has a substantial burden on healthcare systems. Nonetheless, this review adds to the current context by using more recent evidence, such as studies conducted during COVID-19, and by focusing on the importance of socioeconomic disparities in determining the pattern of ED use.

5.1 Implications for external validity

The applicability of these results is limited by the fact that the majority of studies are conducted in high-income nations, primarily the United States and Canada. Differences in healthcare infrastructure, alcohol policy environments, and reporting systems may limit the applicability of these findings to low- and middle-income settings. Future studies should focus on a broader geographic representation to enhance global relevance.

5.2 Implications for Practice and Policy

The implications of this review's findings for clinical practice and public health policy are significant. The systematic integration and scaling of Screening, Brief Intervention, and Referral to Treatment (SBIRT) programs have a strong case at the emergency department (ED) level. Evidence suggests that SBIRT can reduce alcohol consumption in the short-term and enhance referral to special care. However, implementation remains inconsistent due to workforce, time, and training variability. To become more efficient, EDs are recommended to adopt standardized SBIRT guidelines, invest in staff training, and integrate digital or automated screening devices to make them feasible and sustainable in busy clinical settings.

The economic and medical costs of alcohol-related ED use at the policy level justify the necessity of population-wide interventions. Alcohol taxation, minimum unit pricing and tightening of alcohol marketing and supply have all been found to bring harmful consumption habits down. These interventions can be used to supplement ED-based interventions by focusing on the upstream determinants of alcohol-related harm. Enhancing the public health systems that incorporate healthcare services and regulatory measures is the key to attaining the long-term outcomes of alcohol-related morbidity and healthcare use.

Targeting based on equity is also essential. The review notes that alcohol-related ED visits are disproportionate to people in lower socioeconomic statuses and disadvantaged groups. This highlights the need for targeted interventions that address structural determinants of health, such as poverty, access to care, and social support systems. Disparities need to be reduced through tailored community-based interventions, culturally relevant interventions, and enhanced access to preventive services. In the absence of a clear equity lens, clinical and policy interventions have the risk of perpetuating the status quo in terms of alcohol-related harm.

Overall, an integrated solution, involving ED-based clinical interventions, population-level policies, and equity-focused strategies, is required to help reduce the use of alcohol-related emergency departments and their related impact on society.

5.3 Research Limitations

There are some limitations that need to be taken into account. Although the three independent reviewers were used in order to reduce selection bias, the lack of a protocol could lead to reporting bias. The majority of the included studies were conducted in

high-income countries (in particular the US and Canada), which limits the generalizability of the evidence for low-income and middle-income countries and their differing health systems and alcohol policy contexts

Substantial heterogeneity between studies in design and outcome measures as well as populations involved precluded a quantitative meta-analysis from being undertaken Most studies included in the review used administrative and other observational data that are prone to misclassification bias and residual confounding The results of the review are also reliant on the consistent definition of an alcohol-related presentation to the ED These limitations may impact the accuracy and the external validity of the findings and the applicability of the findings to policy and clinical practice

6. Conclusion and recommendations

Alcohol consumption appears to impose a substantial, growing, and unequal burden on emergency healthcare systems worldwide. The evidence compiled in this review suggests a rising trend in alcohol-related emergency department visits across different countries, with a demographic profile typically involving males, young individuals, and those from disadvantaged socioeconomic backgrounds. It also accounts for an economic burden of hundreds of billions of dollars annually in high-income countries. COVID-19 temporarily disrupted this pattern, but there was no overall reduction in demand, and it may even have increased the burden on marginalized groups. These results are generally similar across different healthcare systems, which reinforces confidence in the patterns observed in general despite the differences in study design and setting.

For Screening, Brief Intervention, and Referral to Treatment as part of emergency department service delivery, there is considerable evidence supporting its implementation, particularly for short-term outcomes. However, its effectiveness depends on the setting, and various structural and workforce factors require specific attention. The research on cost-effectiveness provides an economic basis for adopting these strategies. On a population level, alcohol-related harms are unequally distributed across socioeconomic groups. Reducing alcohol-related harm involves both a mix of population-wide policies, such as regulating alcohol supply and marketing, and specific interventions that could improve socioeconomic inequalities.

From a policy and clinical perspective, the findings support the expansion of integrated alcohol intervention strategies within emergency care settings, alongside broader public health policies targeting alcohol availability and socioeconomic inequalities. Enhanced implementation systems on SBIRT and similar interventions are necessary. The alcohol-related harm demands concerted actions by the healthcare system, policy environment, and interventions at the community level to produce significant and enduring changes. These findings reinforce the role of emergency departments as critical intervention points within broader public health strategies addressing alcohol-related harm.

Future research should include prospective multicenter studies to understand better the causes of emergency department visits related to alcohol harms. It should also involve stratified analysis to examine differences across socioeconomic, racial, and ethnic groups. Additionally, implementation science is needed to determine the most effective ways to apply Screening, Brief Intervention, and Referral to Treatment and similar strategies in various healthcare settings. Longitudinal studies are also essential to follow alcohol-related harm trajectories from emergency visits through subsequent care and into communities to assess long-term outcomes of emergency department-based interventions. Significantly, more research should be conducted in low and middle-income countries to enhance the global applicability of evidence in this area.

Declarations

Ethics approval and consent to participate

Not applicable. This study is a systematic review of previously published data and does not involve human participants or primary data collection.

Consent for publication

Not applicable

Conflict of interest

The authors declare no conflict of interest.

Contributors

Andre Craig Christie: Conceptualization, methodology, data curation, writing – original draft.
Krista Whitley: Supervision, methodology review, writing – review & editing.
Melissa Facey: Validation, critical review, writing – review & editing.

Role of funding source

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Data Availability

All data analyzed in this study are derived from previously published articles and publicly available sources. No new datasets were generated.

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Figures

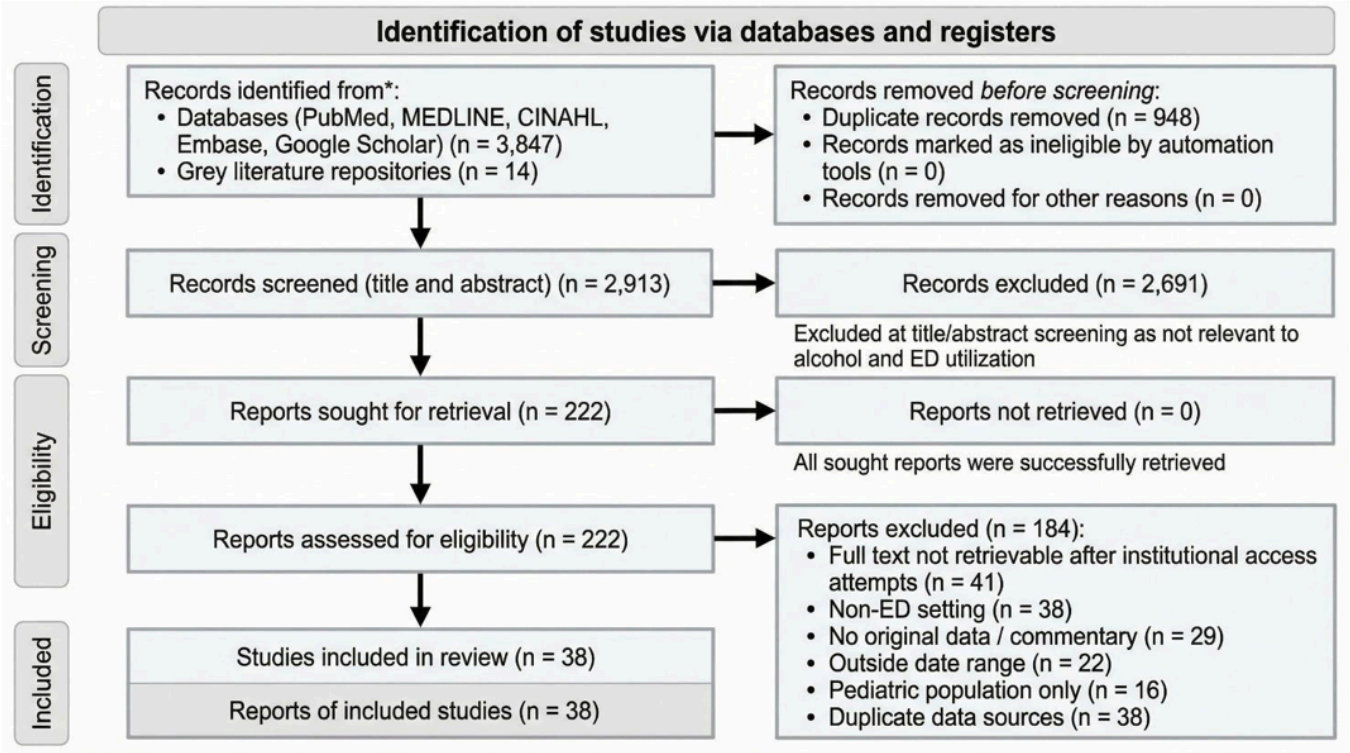


Figure 1

*PRISMA 2020 flow diagram illustrating the study selection process. *Records identified from individual databases: PubMed (n = 1,204), MEDLINE (n = 987), CINAHL (n = 632), Embase (n = 724), Google Scholar (n = 300). **Records excluded at title and abstract screening as not relevant to the review objectives.*

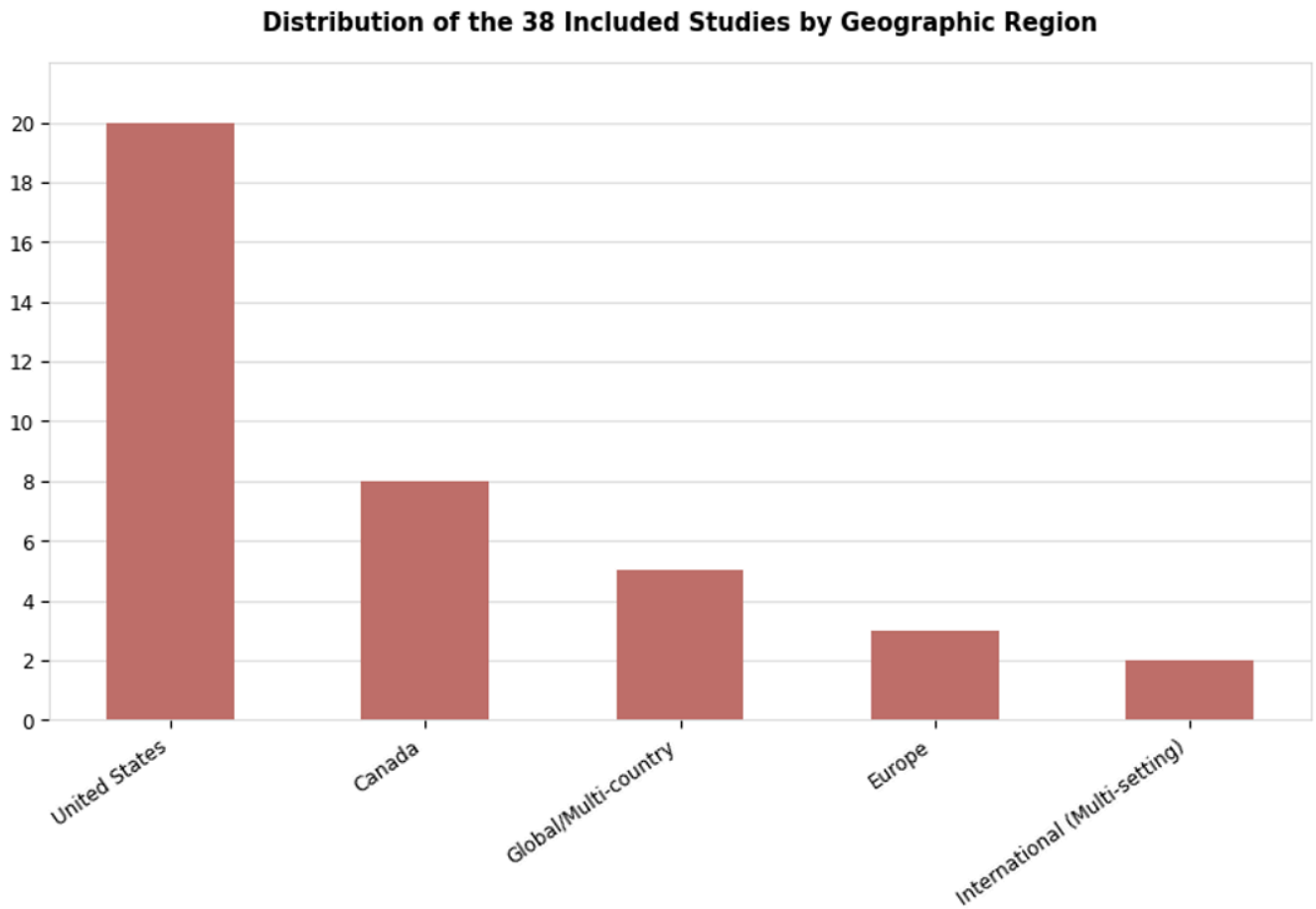


Figure 2

Distribution of the 38 included studies by geographic region.

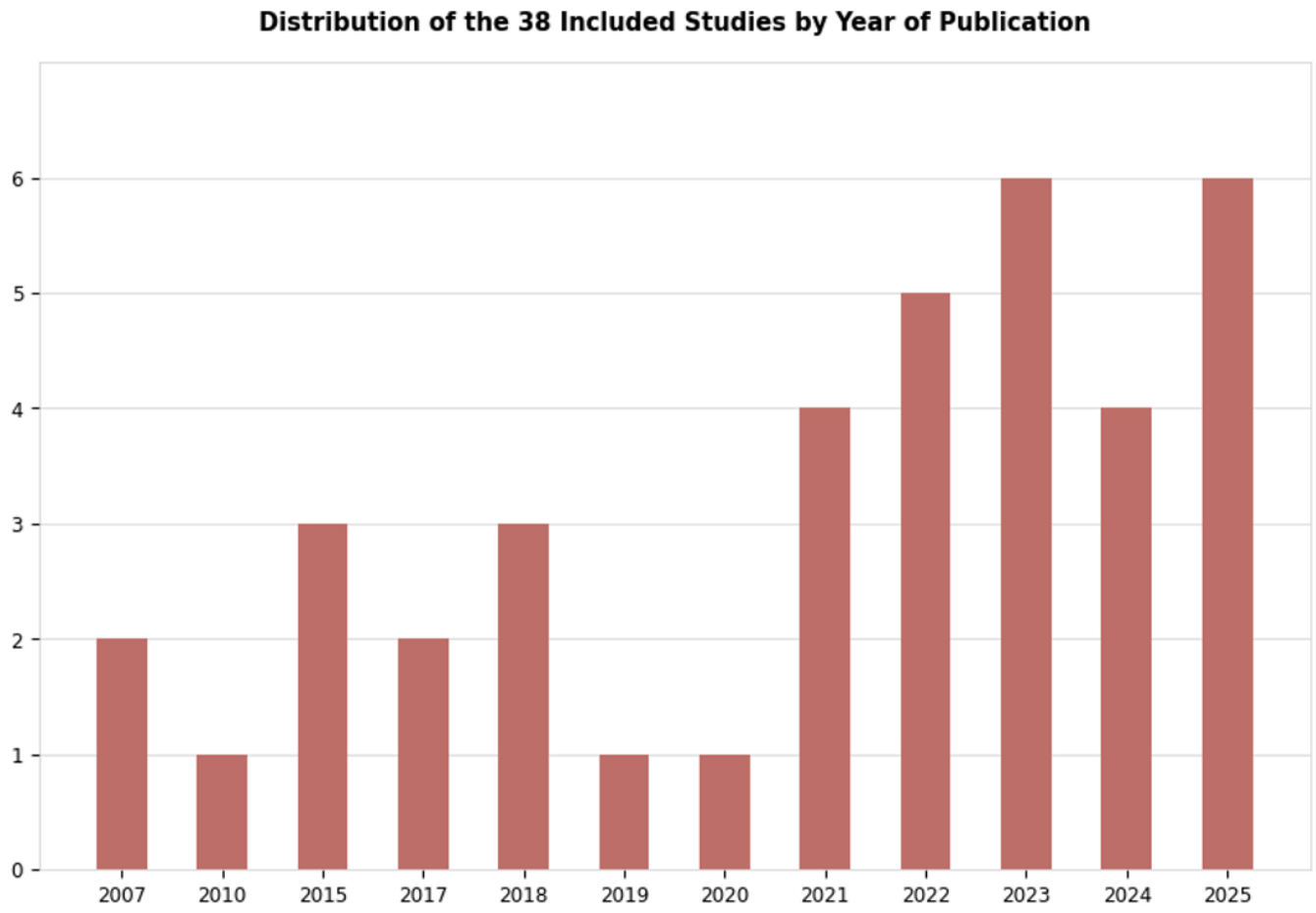


Figure 3

Distribution of the 38 included studies by year of publication.

Supplementary Files

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- AppendixA.docx