A summary of a peer-reviewed research on Alcohol Addiction

Puddephatt, J.-A., Irizar, P., Jones, A., Gage, S. H., & Goodwin, L. (2020). Associations of common mental disorder with alcohol use in the adult general population: A systematic review and meta-analysis

The article provides an in-depth, quantitative synthesis of how common mental disorders (CMDs) and alcohol use disorders (AUDs) co-occur in the adult general population, and how this relationship varies by diagnosis and measurement.

Aim and research questions

The study aimed to:

- Estimate the prevalence of different forms of alcohol use (AUD, binge drinking, general consumption) in adults with and without CMDs.
- Quantify associations (odds ratios) between CMDs and patterns of alcohol use, including by specific CMD categories (mood vs anxiety/phobic).
- Explore whether associations differ by AUD severity, CMD type, study characteristics (e.g., decade, continent), and measurement methods.

CMDs were defined to include major depressive disorder (MDD), dysthymia, generalized anxiety disorder (GAD), panic disorder, phobias, PTSD, OCD, and social anxiety disorder in line with UK CMD guidelines.

Methods

- **Design:** Systematic review and meta-analysis, pre-registered on PROSPERO (CRD42019126770) and reported according to PRISMA and the CoCoPop framework, focusing on prevalence in the adult general population.
- **Search strategy:** PsycINFO, MEDLINE, PsycARTICLES, PubMed, Scopus, and Web of Science were searched from inception to March 2020 using broad MeSH/subject terms covering alcohol use, CMDs, comorbidity, and prevalence; reference lists were also hand-searched.
- **Inclusion criteria:**
    - Peer-reviewed observational studies (cross-sectional, cohort, longitudinal, case-control, national surveys).
    - Adult general population samples (not treatment-seeking or special trauma/illness subgroups).

    - Standardized measures of CMDs and alcohol use/AUD (e.g., DSM instruments) and data allowing comparison of alcohol outcomes in those with vs without CMDs.

- **Exclusion criteria:**
    - Intervention studies, reviews, grey literature.
    - Studies without prevalence data stratified by CMD status, or focused solely on special clinical/trauma populations (e.g., military, epilepsy).

Methodological quality was assessed using the Joanna Briggs Critical Appraisal Checklist for prevalence studies; scores ranged from 3–9 (median 7), indicating a medium–low risk of bias.

Samples and study characteristics

- **Study pool:**
    - 2,862 records after deduplication; 512 full texts screened; 51 studies included in the systematic review; 17 in the quantitative meta-analysis.
    - Total N in meta-analyses: 382,201 participants, across 24 countries; the USA contributed the most significant number of studies.
- **Outcomes:**
    - 33 studies reported mild, moderate, or severe AUD (including DSM-IV abuse/dependence re-mapped to DSM-5 severity categories).
    - 5 reported binge drinking; 12 reported general alcohol consumption; these were synthesized narratively due to heterogeneity.
- **CMD coverage:**
    - 34 studies examined anxiety/phobic disorders; 31 examined mood disorders; MDD was the most frequently studied CMD.
    - None examined alcohol use among those with and without social anxiety disorder specifically.

Meta-analytic approach

The quantitative synthesis focused on AUD because definitions and cut-offs for binge drinking and consumption varied too much for pooled analysis.

- AUD was categorized by DSM-5 severity (mild, moderate, severe), with DSM-IV “abuse” treated as mild and “dependence” as moderate/severe, reflecting prior work on diagnostic correspondence.

- CMDs were grouped into:
    - **Mood disorders:** MDD, dysthymia.
    - **Anxiety/phobic disorders:** GAD, OCD, PTSD, panic disorder, social phobia, specific/straightforward phobia.
    - Comparison group: those without any CMD.
- Random-effects meta-analyses were used (DerSimonian–Laird), reflecting substantial between-study heterogeneity.
- The metaprop command with Freeman–Tukey transformation estimated pooled proportions of AUD among those with and without CMD, then converted to odds ratios.
- Planned analyses included:
    - Overall association between any CMD and any AUD.
    - Stratification by CMD type (mood vs anxiety/phobic).
    - Post-hoc stratification by AUD severity (mild vs none; moderate/severe vs none).
    - Subgroup analyses by decade of data collection and continent.
- Sensitivity analyses removed studies with the most significant and most minor ORs; publication bias was assessed using Egger's test and funnel plots; heterogeneity was quantified with I^2 (>80% indicating high heterogeneity).

Main quantitative findings

Overall association: CMD and any AUD

- Individuals with any CMD had **approximately twice the odds** of having any AUD compared with those without CMD: pooled OR = 2.02 (95% CI 1.72–2.36).
- This two-fold increase persisted after sensitivity analysis, indicating the association was not driven solely by extreme studies.

By CMD type

- **Mood disorders (MDD, dysthymia):** OR = 2.00 (95% CI 1.62–2.47) for any AUD vs no AUD.
- **Anxiety/phobic disorders:** OR = 1.94 (95% CI 1.35–2.78) for any AUD vs no AUD.
- Thus, both broad CMD categories showed very similar effect sizes: roughly doubled odds of AUD.

By AUD severity

- The study additionally examined mild versus moderate/severe AUD in relation to CMD, though specific numerical ORs for each severity band are not detailed in the summary.
- Findings indicated that the elevated odds of AUD among people with CMDs applied across severity levels, not only for severe dependence.

Heterogeneity and moderators

- Heterogeneity was substantial ($I^2 > 80\%$), reflecting differences in:
    - Diagnostic instruments and versions (DSM-IV vs. DSM-5).
    - Sampling frames, countries, and survey periods.
    - CMD composition (which disorders were included under "mood" or "anxiety/phobic").
- Subgroup analyses by decade and continent did not reveal clear explanatory patterns; similarly, study-level characteristics did not clearly account for the variability in effect sizes.

Binge drinking and alcohol consumption

Due to inconsistent definitions and measures, these outcomes were synthesized narratively:

- **Binge drinking:** Only a small number of studies were eligible, and one extensive study dominated the sample size, making meta-analysis inappropriate.
    - Findings were mixed: some studies reported increased binge drinking among those with CMD, others found null or even negative associations (e.g., depression associated with lower odds of binge drinking in some settings).
- **Alcohol consumption (volume/frequency):**
    - Measures and cut-offs varied widely across studies, again precluding pooling.
    - Results showed no consistent pattern; associations appeared to differ by CMD type, age, gender, and context.

The authors note that CMDs may be more consistently linked to *harmful* or *disordered* drinking (AUD) than to simple levels of consumption or episodic heavy drinking, though evidence is heterogeneous.

Interpretation and theoretical context

The authors situate their findings within several models of comorbidity:

- **Stress-coping and incentive-motivation models:** Individuals with CMD may drink to cope with stress, alleviate negative affect, or enhance positive affect when they perceive the benefits of drinking to outweigh the costs.
- **Self-medication hypothesis:** People with depression or anxiety may use alcohol because of its rapid onset of action to relieve distressing symptoms, potentially leading to escalating use and AUD.
- **Bidirectional and causal perspectives:**
    - Longitudinal evidence suggests more substantial support for the direction from poor mental health to increased alcohol use, though bidirectional effects are likely.
    - Genome-wide studies cited indicate a causal relationship from CMDs (e.g., major depression) to alcohol dependence, but not clearly the reverse, suggesting shared genetic and neurobiological pathways.
- **Shared vulnerabilities:** Socioeconomic status (SES) and other contextual factors may contribute to both CMD and alcohol misuse, but the review could not empirically test SES as a moderator because primary studies rarely reported prevalence stratified by SES and CMD status together.

Overall, the evidence supports robust comorbidity between CMDs and AUD but implies a more complex picture for binge drinking and general consumption, likely influenced by diagnosis, age, gender, and other vulnerabilities.

Strengths and limitations

Strengths:

- Large cumulative sample size and inclusion of multiple CMDs (including PTSD and OCD) according to contemporary CMD guidelines, rather than focusing only on depression/anxiety or mixing in bipolar disorder.
- Use of standardized diagnostic criteria and robust systematic review methods (PRISMA, pre-registration, quality appraisal).
- Detailed stratification by CMD category and AUD severity, plus sensitivity and subgroup analyses.

Limitations:

- High between-study heterogeneity, partly due to varied diagnostic tools, time frames (lifetime vs 12-months), and reporting practices.

- Inability to meta-analyse binge drinking and consumption outcomes and to explore SES or other essential moderators in depth.
- Limited coverage of some CMDs (e.g., social anxiety disorder) and reliance on cross-sectional data, which prevents firm causal inference.

Practical implications

The findings underline that:

- Adults with CMDs (depression, anxiety, phobias, PTSD, OCD) are about twice as likely to meet criteria for an AUD as those without CMDs, across diverse countries and survey designs.
- Clinical and public health services should routinely screen for harmful alcohol use among people presenting with CMDs and vice versa, given the elevated comorbidity and associated morbidity and mortality.
- Integrated treatment approaches and service pathways are needed, as people with co-occurring alcohol and mental health problems can face barriers accessing care when systems treat these as separate issues.

Puddephatt, J.-A., Irizar, P., Jones, A., Gage, S. H., & Goodwin, L. (2020). Associations of common mental disorder with alcohol use in the adult general population: A systematic review and meta-analysis