



Assessment of Quality of Life and Depression Status in Patients with Alcohol Use Disorders: An Observational Study Using Whoqol-Bref, Ham-D, and Audit

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Submission: Nov. 1, 2025; Revised: Nov. 23, 2025; Published: Nov. 30, 2025

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ABSTRACT

Alcohol Use Disorder (AUD) often co-occurs with depression, affecting quality of life (QoL). It leads to social and occupational losses, disability, suicidality, and care-seeking barriers. Understanding the relationship between alcohol use severity and depressive symptoms can prioritize screening, guide interventions, and improve person-centered care. Quantify associations between alcohol-use severity and WHOQOL-BREF domains; test depressive symptoms (HAM-D) as mediator/moderator; and obtain covariate-adjusted estimates. Cross-sectional study of 175 adults in psychiatry/de-addiction services. Measures: AUDIT, HAM-D, WHOQOL-BREF; covariates: age, residence, education, occupation. Analyses: ANCOVA, multivariable linear regression, interaction testing, and product-of-coefficients mediation. Mean domain scores indicated broad QoL impairment. Across alcohol-severity tiers, most participants had at least one domain below 50. In adjusted regression, higher depression severity was associated with worse Physical QoL, whereas AUDIT effects were minimal; Psychological, Social, and Environment domains showed no robust adjusted associations. A small AUDIT×HAM-D interaction emerged in the Physical domain. Safety signals included suicidality and medical/psychiatric comorbidity. Mediation suggested small, imprecise indirect effects of alcohol severity via depression. In this clinical AUD cohort, QoL was impaired across domains. Depressive symptoms were the more consistent correlate, especially for Physical QoL, than alcohol-use severity, underscoring the value of integrated screening and treatment in AUD services. Embedding AUDIT, HAM-D, and WHOQOL-BREF in routine workflows may meaningfully improve patient-centered outcomes and inform service design in comparable settings.

Keywords: Alcohol Use Disorder, Depression, Quality of Life, WHOQOL - BREF, HAM -D.

INTRODUCTION

Alcohol Use Disorder (AUD) is a persistent pattern of alcohol use that causes significant impairment or distress across key life areas. According to the *DSM-5-TR*, individuals must meet at least two of eleven criteria within a 12-month period, with severity classified as mild, moderate, or severe [1]. Core features include poor control, craving, and physiological dependence, reflecting both behavioral and biological components [2]. Neurobiological models identify disruptions in reward, stress, and executive control circuits, involving dopaminergic, GABAergic, and glutamatergic changes that sustain compulsive drinking [3-5]. Chronic exposure leads to structural and functional brain alterations, reduced gray matter, and impaired self-regulation, often compounded by inflammation and gut-brain axis disruption [6,7].

Depression commonly co-occurs with AUD, showing a bidirectional relationship where each worsens the other [8-10]. Comorbidity predicts greater relapse, suicidality, and poorer treatment outcomes [11]. Emerging studies identify alterations in amygdala Menin signaling as one mechanistic link, affecting GABAergic inhibition and mood regulation [12]. Clinically, differentiating primary from substance-induced depression requires several weeks of abstinence [11].

Quality of life (QoL), as per WHO, encompasses well-being across physical, psychological, social, and environmental domains [13]. Studies show AUD markedly impairs all domains, with depression mediating the association between alcohol severity and QoL [14-17]. Validated measures such as the WHOQOL-BREF, Hamilton Depression Rating Scale (HAM-D), and Alcohol Use Disorders Identification Test (AUDIT) allow standardized evaluation of these relationships [13,18].

In India, alcohol misuse remains a major mental-health and social burden, with regional variations and high prevalence in Tamil Nadu [19-21]. This study examines how alcohol-use severity (AUDIT) affects domain-wise QoL (WHOQOL-BREF), both directly and indirectly through depression (HAM-D), hypothesizing a significant mediating role of depressive symptoms [22-23].

MATERIALS AND METHODS

Study Design

A hospital-based cross-sectional study with a short-term follow-up (8-12 weeks) in a consenting sub-sample to assess stability of scores and short-term change in QoL.

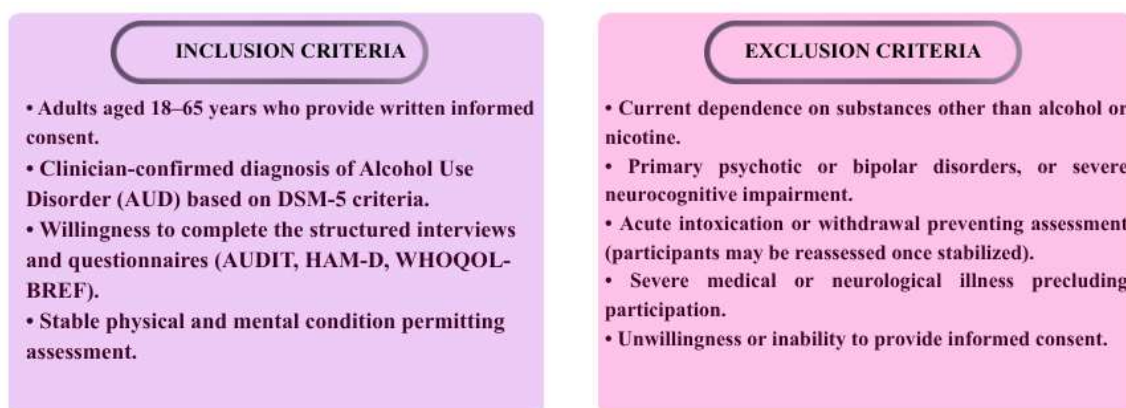
Study Setting and Participants

The study was conducted at the outpatient and inpatient services of the Psychiatry and De-addiction Unit of a tertiary-care teaching hospital in Salem district, Tamil Nadu, South India, in collaboration with the Department of General Medicine for comorbidity management. Participants included married adults aged 18-65 years attending psychiatry or de-addiction clinics, with clinician-confirmed Alcohol Use Disorder (DSM-5 criteria), and stable physical and mental condition. Those with dependence on substances other than alcohol or nicotine, primary psychotic or bipolar disorders, severe neurocognitive impairment, acute intoxication, or serious medical illness were excluded.

Inclusion and Exclusion Criteria

Procedure

The study was implemented in three distinct phases.



Phase 1 (Preparation and Approvals)

A focused literature review (2020-2025) on AUD, depression, and QoL guided protocol development. Ethics approval was obtained from the Institutional Review Board (IRB), and administrative clearance was secured from relevant hospital authorities. Assessors were trained in standardized administration of instruments, and a pilot test with 8-10 participants helped refine SOPs and data flow.

Phase 2 (Recruitment and Data Collection)

Eligible participants were systematically recruited from Psychiatry and De-addiction services. Written informed consent was obtained, followed by baseline assessment using a structured sociodemographic schedule and clinical proforma. Psychiatric diagnoses were confirmed with MINI/SCID, and relevant measures (AUDIT, HAM-D, WHOQOL-BREF) were administered. Safety screening for suicidality and intimate partner violence (IPV) was performed at each contact, with immediate referral if required. Optional laboratory investigations (LFTs, GGT, MCV, CDT) were ordered on clinical indication. A subset of participants underwent short-term follow-up to assess abstinence, relapse, and test-retest reliability of key measures. Data entry was performed with double-entry verification and weekly logic audits to ensure accuracy.

Phase 3 (Analysis and Dissemination)

Data analysis involved descriptive statistics, chi-square tests for categorical variables, and t-tests/ANOVA for continuous measures. Multivariable linear regression estimated adjusted associations between alcohol-use severity (AUDIT) and QoL domains (WHOQOL-BREF), controlling for covariates such as age, sex, socioeconomic status, marital/employment status, illness duration, treatment status, comorbidities, and tobacco use. Mediation analyses were conducted to test the indirect role of depression (HAM-D) between AUD and QoL, using bootstrapped confidence intervals. Interaction effects (e.g., sex × AUDIT) were evaluated when theoretically justified. Ethical approval was obtained from the Institutional Ethics Committee, and written informed consent was secured from all participants. Confidentiality was ensured.

Instruments

Table 1. Instrument, Purpose/Variable Assessed, and Type of Tool

Instrument	Purpose / Variable Assessed	Type Of Tool
<i>MINI / SCID</i>	To confirm psychiatric diagnosis, including Alcohol Use Disorder (AUD) and comorbid depression	Structured clinical interview
<i>AUDIT</i>	To assess alcohol use severity, drinking frequency, and alcohol-related problems	Screening and severity scale
<i>HAM-D</i>	To measure the severity of depressive symptoms among participants	Clinician-rated depression scale
<i>WHOQOL-BREF</i>	To evaluate overall quality of life across physical, psychological, social, and environmental domains	Quality of Life assessment scale
<i>PHQ-9 (optional)</i>	To cross-verify depressive symptoms reported in HAM-D using a self-rating format	Self-report depression questionnaire
<i>SADQ (optional)</i>	To assess the degree of alcohol dependence (physical and psychological)	Self-report dependence scale
<i>Safety Screening Form</i>	To screen for suicide risk and intimate partner violence (IPV) at each assessment point	Brief safety checklist

Quality of Life in AUD - Domains and Determinants

The WHOQOL-BREF reveals that individuals with alcohol use disorder experience a much lower quality of life— not only physically, but also psychologically, socially, and within their environment. When their scores are

compared to those of the general population, the difference is clear in every domain. Clinical research consistently finds the same results. This isn't just an issue of drinking; alcohol dependence impacts many areas of life, and factors like stable relationships, education, and socioeconomic status also influence these scores. The WHOQOL-BREF doesn't just provide an overall picture—it breaks things down so clinicians can identify exactly where someone is struggling. This allows them to monitor progress over time and focus interventions on areas that can truly improve quality of life for people with AUD [24-28].

Diagnostic Classification and Severity Specifiers: DSM-5 and ICD-11

DSM-5 views Alcohol Use Disorder (AUD) as existing along a spectrum. There are 11 criteria, and you count how many are present over the course of a year. If someone meets 2 or 3 criteria, that's considered mild AUD. Meeting 4 or 5 means moderate, and 6 or more indicates severe AUD. DSM-5 included "craving" as a symptom and removed legal problems from its list. ICD-11 takes a different approach. It categorizes alcohol-related conditions into Harmful Use, Dependence, and other related disorders. Rather than just counting symptoms, ICD-11 emphasizes issues with control and how alcohol use disrupts daily functioning. To diagnose, you look for two main sets of symptoms within the same year. The DSM-5 catches milder cases that might otherwise go unnoticed, while the ICD-11 focuses on how much the symptoms interfere with daily life. Both systems emphasize the importance of distinguishing between depression caused by substances and depression that occurs independently. If someone's depressive symptoms remain after they stop drinking, that's when you're looking at a primary depressive disorder—not just depression related to substance use [29-35].

Sample Size, Sampling Technique, and Study Variables

We calculated the sample size using the single-proportion formula:

$$n = \frac{Z^2 \times p \times (1 - p)}{d^2}$$

In this formula, Z is 1.96 for a 95% confidence level, p is 0.638 based on the reported prevalence of depression among individuals with alcohol dependence and d is 0.05. This gives an estimated sample size of approximately 155. To account for a 10% non-response rate, we increased the final sample size to 175 participants. We plan to use systematic random sampling, ensuring proportional allocation so that each level of AUD severity is represented. To maintain group balance, we will use frequency matching by age and sex. For study variables, the AUDIT total score (which assesses alcohol use severity) serves as the main independent variable. Depressive symptoms will be assessed with the HAM-D total score, which will act as a mediator. The dependent variables are the WHOQOL-BREF domain scores. Additional covariates will include age, sex, marital status, socioeconomic status, duration of alcohol use, comorbidities, and treatment status.

Data Analysis Plan

Data will be entered in Microsoft Excel and analyzed using SPSS version 26.

Descriptive analysis

- Frequencies, percentages, means, and standard deviations for key variables.

Inferential analysis

- Pearson's or Spearman's correlations to explore bivariate associations.
- Multiple linear regression to assess the independent effect of AUD severity on QoL.
- Mediation analysis (using PROCESS macro or structural equation modelling) to test indirect effects of depression on the AUDIT-WHOQOL relationship.
- Effect sizes and 95% confidence intervals will be reported.
- Follow-up subsample: Paired t-tests or mixed-effects models will assess short-term change in QoL and HAM-D scores.

Statistical Analysis

Descriptive statistics will summarize participant characteristics and instrument scores. Group comparisons will use χ^2 for categorical variables and t-tests/ANOVA (or non-parametric equivalents) for continuous variables.

Multivariable linear regression will estimate the adjusted association between AUDIT and WHOQOL-BREF domain scores (covariates: age, sex, SES, marital/employment status, age of onset/duration, treatment status, comorbidities, tobacco use). Mediation will be tested with bootstrapped indirect effects (AUDIT as exposure, HAM-D as mediator, WHOQOL-BREF domains as outcomes). Interaction terms (e.g., sex × AUDIT; treatment status × AUDIT) will be explored where justified.

Effect sizes and 95% CIs will be reported, with multiplicity control where applicable. For the follow-up subsample, paired comparisons or mixed-effects models will assess change over time. Findings will be interpreted against Indian and international literature with practical recommendations for integrated screening (AUDIT + HAM-D + WHOQOL-BREF) and stepped care.

De-identified datasets, codebooks, and analysis scripts will be archived securely. IRB close-out documentation will be completed, and materials prepared for potential audit/replication.

Ethical Considerations

Prior approval will be obtained from the Institutional Review Board (IRB). Written informed consent will be secured from all participants, with separate consent for optional follow-up. Confidentiality will be maintained through coded identifiers. Participants reporting suicidal thoughts or intimate partner violence will be immediately referred to clinical services following the institution’s standard safety protocol.

RESULT AND DISCUSSION

All participants were men, mainly in their late thirties to early forties. Most were married. Education levels varied, but the majority had completed secondary school. Most were employed. The group was almost evenly divided between rural and urban residents. This demographic mix is quite similar to what is seen in other clinical groups with alcohol use disorder in comparable healthcare settings. When clinicians examined things more closely, they found a significant burden of depressive symptoms, mostly mild or moderate in severity. Alcohol dependence was even more apparent: over half of the group fell into the “probable dependence” category.

Suicidal thoughts were rare, but about 15% had them to a degree that was concerning. Medical and psychiatric comorbidities were common across the group, underscoring the complexity of their health needs. Quality of life scores were generally not high. Most reported moderate impairment, covering physical, psychological, social, and environmental domains. Physical and environmental quality of life did not change much with alcohol severity, but psychological and social dimensions did. Social functioning, in particular, dropped sharply for those with probable dependence.

Overall, most rated their quality of life as moderate, although a notable proportion described it as poor. After adjusting for demographic variables, depressive symptoms—not alcohol severity—were clearly linked to physical quality of life, although the association was modest. Once these background factors were considered, neither alcohol use nor depression alone showed much relationship to psychological, social, or environmental quality of life. Mediation analysis suggested that depression may play a role in how alcohol use impacts physical quality of life, but the statistical support for this was weak unless the model was adjusted.

There was an interesting finding: the effect of alcohol severity on physical quality of life appeared to depend on the person’s level of depression. This pattern did not really show up in other areas of quality of life, highlighting how complex the connections are between alcohol use, mood, and overall well-being. Taken together, this shows that men with alcohol use disorder bear a heavy clinical and psychosocial burden. Depressive symptoms are particularly important for physical health. The findings support care approaches that address not only alcohol use itself, but the whole person.

Sociodemographic, Residential, and Diagnostic Profile

Table 2. Sociodemographic, Residential, And Diagnostic Profile

Demographic Description	Interpretation and Context
<ul style="list-style-type: none"> ➤ The age distribution of the study participants reflects a broad representation across adult life stages. Most individuals were between 35 and 44 years (29.1%), followed by those aged 55-65 years (24.6%) and 45-54 years (19.4%). ➤ Younger participants aged below 35 years accounted for about one-fourth (26.9%) of the total sample. The mean age of the cohort was 42.3 years (SD = 13.1), with a median age of 43 years. ➤ This spread indicates a predominantly middle-aged study population, aligning with the demographic pattern commonly seen in alcohol use disorder cohorts in tertiary care settings. 	<ul style="list-style-type: none"> ➤ All enrolled participants were male. Findings should therefore be interpreted within a male clinical population and not generalized to women. ➤ Most participants were married (65.1%), with a substantial widowed subgroup (26.9%); smaller proportions were divorced (3.4%) or single (4.6%). ➤ This variation in relationship status is important context for interpreting dyadic functioning and quality-of-life outcomes, as bereavement or separation may independently affect social and psychological domains.
<ul style="list-style-type: none"> ➤ Most participants had schooling up to the secondary level (39.4%), with nearly one-third educated to primary level (32.6%) and about one-fifth reporting tertiary education (17.7%). ➤ Educational attainment varies across the cohort, which is relevant when interpreting differences in quality of life and health-seeking behavior. 	<ul style="list-style-type: none"> ➤ A majority of participants were employed (56.6%), with one quarter unemployed (25.1%). Smaller proportions identified as homemakers, students, or retired. ➤ Employment status may influence access to care and perceived quality of life, so it will be retained as a covariate in adjusted analyses. Participants were almost evenly split between rural and urban residences, supporting subgroup comparisons by place of residence in subsequent analyses.

Clinical Severity and Treatment/Safety Characteristics

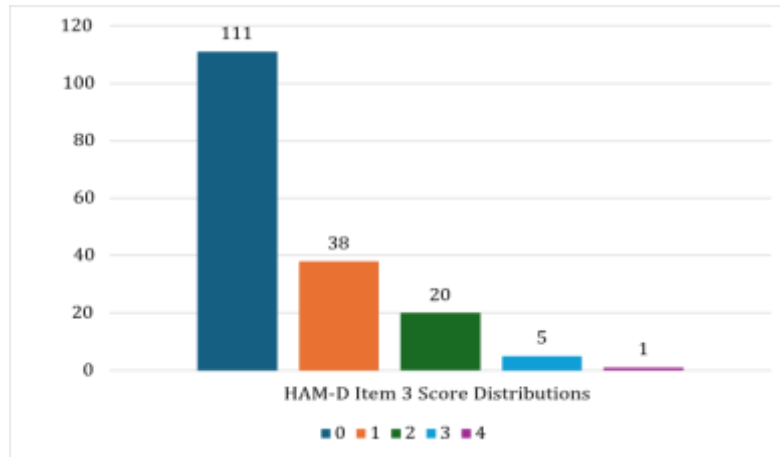
Table 3. Clinical Severity and Treatment/Safety Characteristics

Clinical Measure Summary	Interpretation and Analytical Relevance
<ul style="list-style-type: none"> ➤ Overall depressive symptom burden was in the mild-to-moderate range on average, with a median HAM-D of 12 and an interquartile range of 7 to 18. Category-wise, 37.1% screened in the mild range and 30.9% in the moderate range; 10.9% were severe and 21.1% were normal. ➤ This distribution indicates substantial depressive symptomatology in the cohort, which is pertinent for downstream analyses linking alcohol-use severity to quality-of-life domains with depression as a mediator. 	<ul style="list-style-type: none"> ➤ Alcohol-use severity, measured by AUDIT (0-40), averaged in the harmful-to-probable dependence range, with a median of 23 and an interquartile range of 15 to 30. This distribution indicates substantial alcohol-related risk in the cohort and provides the primary exposure variable for subsequent association and mediation analyses with HAM-D and WHOQOL-BREF domain scores.
<ul style="list-style-type: none"> ➤ Drinking behavior was collected and classified using standard AUDIT severity tiers at baseline. More than half of participants were in the probable dependence range, around one in five fell in the hazardous range, and smaller proportions were in the 	

harmful and low-risk categories.

- This tiered classification provides a consistent basis for subsequent comparisons of WHOQOL-BREF domains and HAM-D scores across levels of alcohol-use severity.

Most participants reported minimal suicidal ideation (scores 0-1), while 14.9% scored 2 or higher, indicating clinically significant risk warranting focused monitoring or referral. This highlights the need to include



suicidality in adjusted analyses and ensure active safety protocols during data collection.

Fig 1. HAM-D Item 3 (Suicidality) – Score Distribution (0-4)

Responses centered around the mid-range (mode = 3), indicating moderate perceived health needs, while about 30.8% reported high dependency on medical care, reflecting significant clinical burden and its impact on quality of life and healthcare use.

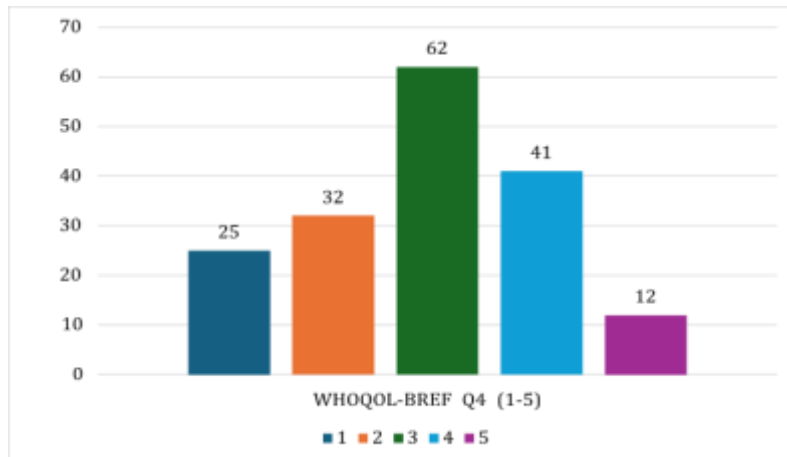


Fig 2. WHOQOL-BREF Q4 – “Need medical treatment to function” (1-5)

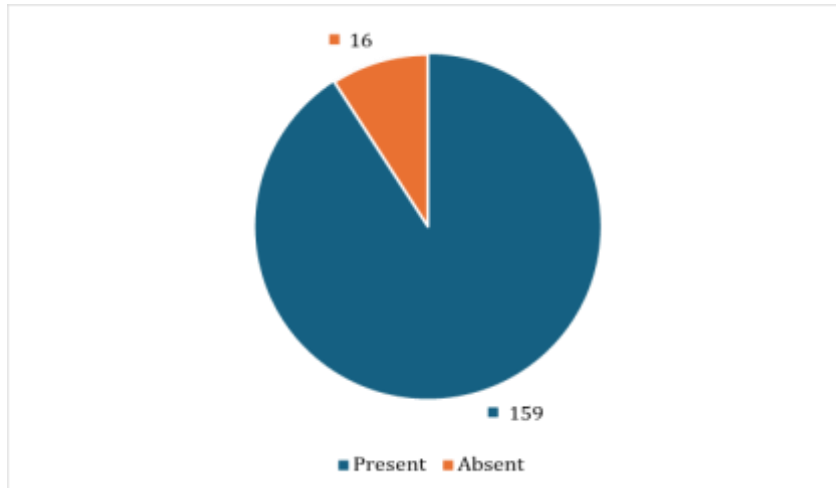


Fig 3. Medical/Psychiatric Comorbidity – Summary (n = 175)

High comorbidity was observed, consistent with the multimorbidity typical of Alcohol Use Disorder, supporting its inclusion as an adjustment variable and emphasizing the need for integrated care addressing both psychiatric and medical conditions.

Quality of Life (WHOQOL-BREF) Outcomes

Table 4. Mean WHOQOL-BREF Domain Scores (Overall, n = 175)

Domain	Mean (SD)	Median (IQR)	Min-Max
Physical	47.61 (8.31)	50 (43-54)	25-67
Psychological	53.12 (9.74)	54 (46-62)	25-79
Social Relationships	47.86 (13.06)	50 (42-58)	16-83
Environment	51.36 (8.56)	50 (47-56)	31-71

Moderate impairment seen across domains.

Table 5. Global Quality of Life (1-5)

Global QoL (1-5)	No. of Participants (n)	Percentage (%)
1	18	10.3
2	31	17.7
3	67	38.3
4	44	25.1
5	15	8.6

Table 6. Participants with Quality of Life Below Threshold (n = 175)

AUDIT Severity	QoL < 50 (n, %)	QoL ≥ 50 (n, %)
Hazardous (8-15)	44 (83.0)	9 (17.0)
Harmful (16-19)	64 (87.7)	9 (12.3)
Probable dependence (20-40)	43 (87.8)	6 (12.2)

Impairment present in most across severities

Table 7. ANCOVA – Adjusted Means (covariates: age, residence, education, occupation)

Domain	AUDIT Severity	Adjusted Mean	95% CI
Physical	Hazardous	46.98	30.35-63.61
	Harmful	48.07	31.51-64.63
	Probable dependence	47.83	31.21-64.46
Psychological	Hazardous	54.04	34.73-73.35
	Harmful	51.08	31.85-70.30
	Probable dependence	54.12	34.81-73.42
Social Relationships	Hazardous	47.79	21.04-74.54
	Harmful	51.17	24.54-77.80
	Probable dependence	46.95	20.21-73.70
Environment	Hazardous	51.36	33.94-68.77
	Harmful	51.58	34.24-68.92
	Probable dependence	52.63	35.22-70.05

Adjusted means stable across tiers.

Association, Mediation, and Robustness Analyses

Table 8. Linear Regression – WHOQOL-BREF Physical & Psychological vs Alcohol and Depression Severity (Adjusted)

Outcome	Predictor	Beta	95% CI	p-value	Model R ² (Adj.)
Physical	AUDIT	0.014	-0.155 to 0.183	0.8683	0.039
	HAM-D	-0.167	-0.317 to -0.017	0.0293	
Psychological	AUDIT	0.036	-0.164 to 0.237	0.7217	0.009
	HAM-D	-0.049	-0.228 to 0.129	0.5848	

HAM-D associated with Physical QoL only.

Table 9. Linear Regression – WHOQOL-BREF Social & Environment vs Alcohol and Depression Severity (Adjusted)

Outcome (WHOQOL-BREF)	Predictor	Beta	95% CI	p-value
Social Relationships	AUDIT (per 1-point)	-0.211	-0.487 to 0.065	0.1335
	HAM-D (per 1-point)	-0.040	-0.285 to 0.205	0.7488
	Model R ² (Adj.)	-0.041		
Environment	AUDIT (per 1-point)	0.096	-0.081 to 0.274	0.2855
	HAM-D (per 1-point)	-0.112	-0.270 to 0.045	0.1617
	Model R ² (Adj.)	-0.003		

No significant direct effects observed.

Table 10. Mediation Analysis (Unadjusted)

Metric	WHOQOL-BREF Physical	WHOQOL-BREF Psychological
Total effect of AUDIT (c)	0.058	0.021
Direct effect of AUDIT (c')	0.043	0.013
Indirect effect via HAM-D (a×b)	0.015	0.007
Sobel z	1.06	0.66
Sample size (n)	175	175

Indirect effects small and non-significant.

Table 11. Interaction – AUDIT × HAM-D on WHOQOL-BREF Domains (Adjusted)

Domain	Interaction (B)	95% CI	p-value	Model R ² (Adj.)	n
Physical	0.021	0.0003-0.0418	0.057	0.0418	175
Psychological	-0.0086	0.0163-0.0412	0.1977	0.013	175
Social Relationships	-0.0282	0.0062-0.7235	-0.047	-0.047	175
Environment	-0.0176	0.0045-0.0267	0.6867	-0.008	175

Significant interaction only for Physical QoL.

Quality Of Life Burden Across AUD Severity

In this study, quality-of-life (QoL) impairment was profound across all levels of alcohol-use severity: 83.0 % of participants in the hazardous AUDIT tier, 87.7 % in the harmful tier, and 87.8 % in the probable- dependence tier had at least one WHOQOL-BREF domain score below 50. Domain means on the 0-100 transformed scale were: Physical \approx 47.61 (SD 8.31), Psychological \approx 53.12 (SD 9.74), Social \approx 47.86 (SD 13.06), and Environment \approx 51.36 (SD 8.56). These values signal that substantial QoL deficits begin well before the threshold of dependence and pervade multiple life domains.

These findings align with hospital-based data from Bratu et al. (2024), who used WHOQOL-BREF among inpatients with AUD and found domain means predominantly in the mid-40s to low-50s, highlighting that QoL impairment is integral to the clinical presentation of AUD rather than a late development.²⁷

Likewise, Huang et al. (2021) in China reported that among 515 AUD patients, those with depressive symptoms had significantly poorer SF-36 scores in all domains, and BDI scores correlated negatively with all eight SF-36 domains ($r \approx -0.23$ to -0.71). They also saw negative correlations between AUDIT and SF-36 domains [36]. Their study reinforces that in AUD populations, QoL burden is widespread and depression exacerbates it.

In a large community-based Chinese male sample ($n \approx 39,163$ with AUD), Lu et al. (2022) observed that AUD presence was associated with 37% lower odds of optimal QoL (OR = 0.63, 95% CI 0.61 to 0.65) relative to non-AUD drinkers. This underscores the macro-level association between AUD and poorer subjective health [37]. However, in the present clinical sample, the incremental explanatory power of AUD severity itself was modest after controlling for depression and demographics, suggesting that comorbid psychopathology and psychosocial factors may absorb much of the variance.

Depression vs. AUD Severity: Dominant Correlates of QoL

A pivotal finding in this study was that, after multivariable adjustment, depressive symptom severity (HAM-D) retained a statistically significant inverse association with Physical QoL ($B \approx -0.167$, 95% CI - 0.317 to -0.017, $p \approx 0.029$), whereas AUDIT's direct effect on Physical QoL was negligible. This suggests that in this clinical sample, depression is a stronger correlate of perceived physical functioning than drinking severity per se.

This echoes broader psychiatric evidence where depressive symptom burden consistently predicts QoL across domains, sometimes outstripping other clinical factors. For example, McPherson et al. (2022) emphasize that QoL instruments often capture variance tightly linked to mood symptoms even when conceptualizing QoL as distinct from symptom severity.⁴⁹ In substance-using populations too, depression often emerges as a more stable predictor of subjective well-being than usage metrics.

Huang et al. similarly found that depression (BDI) had robust negative associations with all SF-36 domains, stronger than many of the AUDIT-QoL correlations.³⁶ Taken together, the literature supports the interpretation that depressive burden may mediate or overshadow the effect of alcohol severity on subjective well-being, particularly in clinical cohorts where psychopathology is common.

Moderation by Depression: An Interactive Dynamic in Physical QoL Beyond main effects, this study detected a small but statistically significant interaction between AUDIT and HAM-D in models predicting Physical QoL ($B \approx 0.0211$, 95% CI 0.0003 to 0.0418). This indicates that the negative impact of higher drinking severity on physical functioning is amplified in individuals with greater depressive symptom burden. In other words, alcohol severity correlates more steeply with QoL decline among those already more depressed.

This moderation insight extends existing models of QoL change in AUD. For instance, Bratu et al. (2024) propose that affective states mediate changes in QoL over time in AUD treatment, suggesting latent interactivity between mood and functional outcomes.¹⁸ While they didn't test the specific AUD \times depression interaction, the conceptual framework invites it. The current finding suggests that depression is not only a mediator but a contextual amplifier of how drinking severity translates to physical health perception.

Domain-Specific Nulls and Residual Contributors

In Psychological, Social, and Environmental domains, neither AUDIT nor HAM-D (nor their interaction) showed strong adjusted associations; confidence intervals were broad and model explanatory power low. This implies that for those domains, unmeasured psychosocial, personality, or contextual factors (e.g. social support, stigma, comorbid anxiety, health status) may be more influential. This matches modelling studies in QoL literature (e.g., systematic reviews) which show that symptom severity frequently accounts for only a

proportion (e.g. 25-40%) of QoL variance; the remainder lies in psychosocial moderators. The WHOQOL systematic review (Bratu et al., 2023) notes the importance of contextual and individual difference variables beyond clinical symptoms in substance-using populations.²⁵

Also, in AUD patient cohorts, studies like Lu et al. (2022) suggest that environmental factors (e.g. socioeconomic status, comorbid disease), which were only partially included in this study, may drive variation in non-physical QoL domains.³⁷

Integrative Summary: Mediation, Moderation, and Explanatory Balance

The small (non-significant) indirect paths in unadjusted analyses indicate partial mediation by depression, while the interaction in Physical QoL shows that depression also modifies the AUDIT-QoL relationship. Depression thus acts as both a pathway and a lens for how alcohol severity affects physical well-being, with weaker direct effects in other QoL domains and larger unexplained variance. This highlights that depression is a key mechanistic and modulatory factor in AUD-QoL models, with domain-specific modulation - especially in Physical QoL - providing new insights into the links between drinking severity, mood, and life quality in clinical populations.

LIMITATIONS OF THE STUDY

- Cross-sectional, single-center design precludes temporal ordering and causal mediation; possible model misspecification/non-linearity with low adjusted R² and limited power.
- Predominantly male, hospital-based, treatment-seeking sample limits generalizability to women, community, and non-treatment-seeking populations; selection bias may inflate depression/low-QoL estimates and distort associations.
- Self-report/recall and interviewer variability (AUDIT/HAM-D), generic WHOQOL-BREF sensitivity, incomplete capture of key confounders (anxiety, pain, trauma, sleep, social support, stigma), missing-data handled via complete cases, uneven use of biomarkers/diagnostic interviews → risk of misclassification and unmodelled contextual/service effects.

CONCLUSION

The study conducted among adults with Alcohol Use Disorder (AUD) at a tertiary-care center in Salem revealed that quality-of-life (QoL) impairments were widespread and affected multiple areas of functioning. Across participants categorized by the Alcohol Use Disorders Identification Test (AUDIT) into hazardous, harmful, and probable dependence groups, most scored below the 50-point threshold in at least one WHOQOL-BREF domain. Average scores were moderate across areas—Physical (47.6), Psychological (53.1), Social (47.9), and Environmental (51.4)—indicating that limitations in daily activity, emotional and psychological health, social interactions, and environmental satisfaction occur throughout the spectrum of alcohol involvement rather than only among those with severe dependence.

Joint analyses of determinants showed that higher depression severity, as measured by the Hamilton Depression Rating Scale (HAM-D), had a small but statistically meaningful negative association with physical QoL, even after taking into account alcohol severity and sociodemographic variables. Once depression was included in the model, the direct influence of AUDIT scores on overall QoL diminished considerably, suggesting that depressive symptoms account for much of the observed variation. Furthermore, a modest interaction between AUDIT and HAM-D scores within the Physical domain indicated that individuals with greater depressive burden experienced stronger declines in perceived physical health with increasing alcohol severity. For the Psychological, Social, and Environmental domains, adjusted associations were weaker and less precise, implying that other clinical and psychosocial elements—such as anxiety, physical pain, limited social support, stigma, coexisting medical issues, or maladaptive coping—may play substantial roles in shaping well-being across these areas.

Mediation models provided only minimal, statistically non-significant evidence that depression transmitted the effect of alcohol severity to QoL, supporting the interpretation that depression operates mainly as a concurrent factor or moderator rather than as an intermediary pathway. Taken together, the findings underline that reduced quality of life is pervasive across differing levels of alcohol use severity.

Depression emerged as a core contributor, especially in how individuals perceive their physical health. These results highlight the importance of integrated assessment and treatment approaches that simultaneously address both alcohol use problems and depressive symptoms. Focusing only on alcohol measures is unlikely to

capture the full burden experienced by patients; a combined, depression-informed strategy is more likely to improve everyday functioning and overall quality of life.

AUTHOR CONTRIBUTIONS

The research study was conceptualized and led by Prakasham S as the corresponding author, with Aasha S and Manivannan R listed as co-authors. Specific contributions, such as protocol development, data collection, and analysis, were collectively managed as described under the study phases, but detailed author role breakdown is not explicitly stated in the file.

Institutional Review Board Statement

The study was conducted in accordance with the Declaration of Helsinki and received approval from the Institutional Review Board (IRB). Written informed consent was obtained from all participants prior to enrollment, and confidentiality was maintained through coded identifiers. All ethical protocols and participant safety measures were strictly followed throughout the research process.

INFORMED CONSENT STATEMENT

All subjects gave their informed consent for inclusion before they participated in the study.

DATA AVAILABILITY STATEMENT

These materials are available upon reasonable request to the corresponding author, in accordance with institutional policy and data protection standards.

ACKNOWLEDGMENTS

The study team acknowledges the support and collaboration of the Department of General Medicine for comorbidity management, the Psychiatry and De-addiction Unit staff for help in recruitment and assessment, and hospital authorities for administrative clearances. Appreciation is extended to all assessors, trainees, and peer reviewers involved in the preparatory and review stages of the protocol.

CONFLICT OF INTEREST

Authors declare for none conflict of interest.

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