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Abstinence as an Outcome in Patients with Alcohol Use Disorder: A Prospective Study

Akhil Das[1], Aravind Karunakaran[1], Jaimon Plathottathil Michael[1], Ganga Gangadhara Kaimal[1], Varghese Punnoose[1]

[1]Government Medical College, Kottayam, Kerala, India

Keywords

Alcohol abstinence; treatment outcome; alcoholism; recurrence

Abstract

Aim: Alcohol use disorder (AUD) has a high relapse rate post treatment with first 3 months being the most vulnerable. This study estimated the proportion of abstinent subjects 3 months after treatment and predicted the abstinence status based on clinical and sociodemographic variables. **Subjects and Methods:** All patients with AUD who attended the deaddiction clinic during the study period and met the inclusion and exclusion criteria were recruited into the study and followed up for 3 months after detoxification. Severity of substance use was assessed by ASSIST. Craving was assessed by Penn Alcohol Craving Scale and self-efficacy by General Self Efficacy Scale. Both parametric and non-parametric analysis were undertaken to address the research questions. **Results:** Out of 102 subjects, 54.9 % were abstinent for 3 months. 29.4 % relapsed, 7.85 % had a lapse and 7.85 % dropped out from the study. Abstinence status could be predicted by lower baseline craving scores, absence of comorbid psychiatric disorder and other substance use. Significant reduction in craving scores were seen in abstinent subjects at 3 months. Difference in alcohol use severity and craving scores were significant between two groups at baseline. **Conclusion:** Relapse should be expected in treatment for AUD with multiple factors contributing. This study findings shows the role of craving, comorbidities of psychiatric disorders and other substance use in relapse. A routine screening for comorbid psychiatry diagnosis and addressing comorbid substance use is warranted.

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Introduction

Whether complete abstinence should be realistically targeted as the expected outcome in the treatment of Alcohol Use Disorder (AUD) is a question that needs to be explored. Relapse in AUD is said to occur when the patient returns to heavy drinking following a period of abstinence or decreased use [1]. AUD has a relapsing-remitting course and a high rate of relapse post-treatment, with up to 40–60 % of patients relapsing within 3 months and 70–80 % relapsing by 12 months [2]. A study done in South India showed a 72.08 % relapse rate after 3 months of treatment for AUD [3]. However, abstinence should not be considered an unreasonable target as it has evident short- and long-term advantages [4]. The neural sensitization to alcohol persists for long term, leaving the patient vulnerable to a complete relapse even with small amounts of alcohol able to recrudesce the sensitized system [5].

Correspondence to:
Dr. Aravind Karunakaran MD
Assistant Professor of Psychiatry
Government Medical College
Gandhinagar P.O, Kottayam
Kerala, India.
E -mail: aravind2k5@yahoo.com

Relapse in alcohol use is often a result of dynamic interaction between biological, psychological, and environmental risk factors [1]. Craving, and self-efficacy are two important variables which can predispose to relapse. Craving is one of the major features of addiction, which poses a challenge to people experiencing addiction in overcoming drug-seeking behaviours and it contributes to relapse [6,7]. Craving for alcohol has been shown to result in a shorter time to relapse, a low rate of complete abstinence and a higher quantity of alcohol consumption [8]. As per the model proposed by Marlatt, relapse to substance use is often the final event in a sequence of maladaptive responses to stressors, either internal or external [9]. Self-efficacy, defined as a person's confidence regarding their capacity to cope with a high-risk situation is important in preventing a relapse. A high perceived self-efficacy can help in maintaining abstinence, while a low self-efficacy can lead to minor lapses and eventually into a full relapse [9]. Burling et al and McKay et al in their studies had also reported that patients who remained abstinent had higher scores on all measures of self-efficacy [10,11].

Another factor to consider in substance use disorders is the high rate of comorbidity with other psychiatric disorders, which often leads to an early relapse [12]. It has been shown that individuals with excessive alcohol consumption despite supportive psychosocial factors reported low levels in measures of mental well-being, with improvement noted following abstinence or a decrease in alcohol consumption [13,14].

Studies show that relapse to alcohol use happens mostly in the early phase after treatment, with the first 3 months the most vulnerable period, after which the relapse rate is shown to have a decreasing trend [15]. Hence it is of significant clinical importance to determine the factors which may precipitate a relapse in patients who undergo treatment for AUD, especially in the early phase of treatment. Even though prospective evaluations of rates of return to drinking have been done in western population, there is a paucity of prospective follow-up studies determining the rate of relapse following treatment for AUD and the factors which predispose to relapse or abstinence in Asian population, and especially in Indian settings. The present study attempts to fill the gap in literature and explores how well the findings in western population translates to Asian and Indian settings. This study aims to:

i) To estimate the proportion of patients with AUD remaining abstinent 3 months after initiation of treatment for AUD.
ii) To predict the abstinence status by craving and self-efficacy.
iii) To predict the abstinence status by presence of comorbid mood and anxiety disorders, other substance use and sociodemographic variables.

Subjects and Methods

This prospective observational study was carried out in Government Medical College Kottayam, a tertiary care centre in South India after obtaining approval from the Institutional Review Board/ Ethical committee (IRB No: 115/2023). All the procedures involving human subjects were approved by the Institutional Review Board/Ethical committee.

All the patients who attended the Deaddiction clinic of Government Medical College Kottayam above 18 years of age and diagnosed with AUD according to DSM 5 were recruited into the study after taking written informed consent. Only those patients with intellectual disability, psychosis and/or mild or major neurocognitive disorders were excluded from the study. Out of the total 105 patients who were registered in the deaddiction clinic during the study period of six months from March 2023 to September 2023, 102 patients who satisfied the inclusion and exclusion criteria were enrolled on the study. Deaddiction clinic of Government Medical College Kottayam consists of a dedicated inpatient facility and outpatient service. All the participants who enrolled into the study were given inpatient care to manage withdrawal symptoms for 12 - 15 days and then followed up on an outpatient basis for 3 months. The treating team consists of two consultants and a psychiatry trainee along with nursing staff. Withdrawal symptoms were managed with lorazepam along with thiamine supplementation. Evaluations for any other primary psychiatric comorbidities were done after withdrawal phase and before being discharged from the hospital. The first session of motivational enhancement therapy (MET) was done during inpatient treatment, once withdrawal symptoms subsided. Further sessions were done on follow up once every two weeks and the participants were followed up for 3 months. The therapy sessions also included psychoeducation about the consequences of substance use, relapse prevention strategies and life skills. The initial session during inpatient care was of 60 minutes duration and the follow up (outpatient) sessions were of 30 - 45 minutes duration. All the therapy sessions were done on one-to-one basis and were supervised by a senior consultant. Anti-craving medications were given unless there was significant hepatic impairment. Anti-craving medications were prescribed by the treating psychiatrist and Naltrexone 50 mg/day was preferred when the hepatic status was within normal limits. When Naltrexone was contraindicated Baclofen 60 mg/day or Topiramate 100 mg/day were preferred. Following discharge, the participants were also connected to local Alcoholic Anonymous groups. In those who either lapsed on relapsed the drinking pattern was obtained from self-report and corroborated with relatives when possible. In case of participants who lapsed or relapsed before 3 months, it was taken as the study end point for the subject and further assessment was deferred for the subject. However they remained in follow up and continued with the treatment. Participants who discontinued the follow-up were considered dropouts.

Assessment Tools

Penn Alcohol Craving Scale (PACS)

PACS is a five-item self-reported measure used to assess alcohol craving over the past week with good psychometric properties. Each question is scored from zero to six with a total score of 30 [16].

General Self-Efficacy Scale (GSES)

GSES is a validated tool which measures perceived self-efficacy for coping with daily hassles and stressful life events [17]. The ten-item version was used in the current study with each question scored from 1 to 4 with scores ranging from 10 to 40 and higher scores indicating better self-efficacy [18].

The Alcohol, Smoking and Substance Involvement Screening Test (ASSIST)

ASSIST collects information about recent and lifetime use of psychoactive substances and associated problems and has excellent psychometric properties. ASSIST consists of eight questions and the scoring is done by adding the scores of questions from two to seven, except in the case of tobacco use where question five is omitted. The scores range from 0 to 31 in the case of tobacco and 0 to 39 for all other substances. A score of 0 to 10 for alcohol and 0 to 3 for other substances falls under lower risk, a score of 11 to 26 for alcohol and 4 to 26 for other substances falls under moderate risk and a score of more than 27 falls under high risk for both alcohol and other substances [19,20].

ASSIST was chosen for the current study since it also quantifies the use of other psychoactive substances and there is usually a high level of comorbidity between AUD and other psychoactive substances [21].

A specially designed proforma was used for collecting relevant sociodemographic and clinical data. Socioeconomic status was assessed by Modified Kuppuswamy socioeconomic scale 2023 [22]

Operational definitions

Abstinence

Participants were categorized as abstinent when they self-reported that they had not consumed any alcohol during the three-month follow-up and had a GGT value of <50 IU/L [23].

Lapse

Participants were categorized as having lapsed when they self-reported consuming alcohol at least once during the three-month follow-up but not more than 4 standard drinks on a single day or 14 standard drinks per week [24].

Relapse

Participants were categorized as having relapsed when they self-reported consuming more than 14 standard drinks per week or 4 standard drinks per day at any assessment during the three-month follow-up period [24].

Statistical analysis

Data were entered into Microsoft Excel and was analyzed using GNU PSPP, which is a freely available software for statistical analysis. Shapiro Wilk test was used to assess the normality of quantitative variables. Quantitative data were measured with mean, standard deviation, minimum and maximum values. Categorical data were expressed in frequencies and percentages. Independent student t test and one way Analysis of variance (ANOVA) were used to assess the association between the demographic variables and normally distributed quantitative variables. Mann Whitney U test was used to assess the association between demographic variables and alcohol use in years, as the data were not normally distributed. Chi Square (X^2) test was used to assess the associations between the demographic variables and categorical data. Repeated measures of ANOVA (RMANOVA) were used to assess the craving scores of abstinent participants at baseline, one month, two months and at three months of abstinence. Pearson's correlation coefficient was used to assess the correlation between age and the normally distributed continuous variables and Spearman's rho was used to assess the correlation between age and alcohol use in years. The value of $p < 0.05$ was considered to be significant.

In the current study, categories of lapse and relapse were combined meaning participants were grouped into abstinent at three months and non-abstinent for statistical analysis.

The authors confirm that all the procedures contributing to this study comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008. All the procedures involving human subjects were approved by the Institutional Ethics Committee.

Results

The mean age of the participants was 42.9 years with a Standard Deviation (SD) of 9.6 years, and range of 19 - 68. 62 (60.8 %) had completed high school education, and only 3 (2.9 %) were unemployed. Participants had used alcohol for a median of 14.5 years (interquartile range (IQR) = 16). Minimum duration of drinking was 2 years and maximum was 43 years. Duration of AUD was > 20 years in 46 (45.1 %) of participants and 97 (95 %) were started on anti-craving agents, with Baclofen being used in 83 (81.4 %) participants.

The socio-demographic profile of participants and its association with abstinence status is depicted in Table 1.

There was no statistically significant association between abstinence status and the following variables: Education, Occupation, Socioeconomic class, Marital status, Tobacco use, Duration of drinking ($p > 0.05$)

Significant associations were seen with comorbid mood and anxiety disorders ($p = 0.017$) with comorbid mood and anxiety disorder more common in the lapse/relapse group (45.7 %) than the abstinent group (23.2 %). Other substance use also had a significant association with abstinence status ($p = 0.039$) with 15.2 % of the lapse/relapse group having other substance use compared to only 3.6 % in the abstinent group.

Abstinence status after three months

Out of the 102 participants, 56 (54.9 %) [95% Confidence Interval (CI) was 45.2 % - 64.6 %] maintained complete abstinence for the entire duration of the study, 30 (29.4 %) [95 % CI was 20.6 % - 38.2%] relapsed, 8 (7.85 %) [95 % CI was 2.6 % - 13 %] lapsed and 8 (7.85 %) [95 % CI was 2.6 % - 13 %] were lost to follow up. Of the 38 persons who had lapsed or relapsed, 20 (52.6 %) [95 % CI was 36.7 % - 68.5 %] maintained abstinence for 1 month, 12 (31.6 %) [95 % CI was 16.8 % - 46.4 %] maintained abstinence for 2 months and 6 (15.8 %) [95 % CI was 4.2 % - 27.4 %] relapsed before the completion of 3 months.

The mean age of abstinent participants was 43.4 years (SD = 9.8 years) and non-abstinent (Lapse/Re-

Table 1. Sociodemographic factors and their association with abstinence status (n = 102)

Clinical and sociodemographic variables			Abstinence Status		X2 Value	p Value
		n (%) 102	Abstinent 56 (54.9 %) (n %)	Lapse/Relapse /Dropouts 46 (45.1 %) (n %)		
Education	Primary	24 (23.5)	14 (25)	10 (21.7)	0.27	0.874
	High School	62 (60.8)	34 (60.7)	28 (60.9)		
	College & Higher	16 (15.7)	8 (14.3)	8 (17.4)		
Occupation	Unemployed	3 (2.9)	1 (1.8)	2 (4.3)	4.67	0.198
	Unskilled labor	48 (47.1)	27 (48.2)	21 (45.7)		
	Skilled labor	43 (42.2)	21 (37.5)	22 (47.8)		
	Professional	8 (7.8)	7 (12.5)	1 (2.2)		
Socio Economic class	Lower	50 (49)	26 (36.4)	22 (47.8)	0.33	0.564
	Middle	52 (31.)	30 (25)	18 (39.1)		
Marital Status	Married	25 (24.5)	15 (26.8)	10 (21.7)	1.16	0.559
	Unmarried	67 (65.7)	37 (66.1)	30 (65.2)		
	Separated/Divorced	10 (9.8)	4 (7.1)	6 (13.1)		
Tobacco Use	Present	74 (72.5)	37 (66.1)	37(80.4)	2.62	0.106
	Absent	28 (27.5)	19 (33.9)	9 (19.6)		
Comorbid mood and anxiety disorders	Present	34 (33.3)	13 (23.2)	21 (45.7)	5.72	0.017
	Absent	68 (66.7)	43 (76.8)	25 (54.3)		
Other Substance Use	Present	9 (8.8)	2 (3.6)	7 (15.2)	4.26	0.039
	Absent	93 (91.2)	54 (96.4)	39 (84.8)		
Duration of Drinking	< 5 Years	20 (19.6)	9 (16.1)	11 (23.9)	3.92	0.270
	6 - 10 Years	16 (15.7)	7 (12.5)	9 (19.5)		
	11 - 20 Years	20 (19.6)	15 (26.8)	5 (10.9)		
	> 20 Years	46 (45.1)	25 (44.6)	21 (45.7)		

X^2 - Chi Square

Table 2. Association between sociodemographic and clinical variables and Penn Alcohol Craving Scale (PACS) score at baseline

Clinical and sociodemographic variables		Mean PACS Scores (SD)	t/F Value	p Value
Education†	Primary	6.5 (6.6)	0.410	0.667
	High School	6.2 (7.3)		
	College & Higher	8.3 (8.3)		
Occupation†	Unemployed	12.3 (13.6)	0.343	0.795
	Unskilled labor	6.1 (6.7)		
	Skilled labor	6.4 (6.9)		
	Professional	9.0 (10.3)		
Socio Economic class*	Lower	7.7 (7.3)	1.49	0.138
	Middle	5.6 7.2)		
Marital Status†	Married	6.6 (7.9)	1.55	0.231
	Unmarried	7.1 (7.3)		
	Separated/Divorced	3.9 (4.9)		
Tobacco Use*	Present	6.4 (7.2)	-0.559	0.557
	Absent	7.3 (7.5)		
Comorbid mood and anxiety disorders*	Present	7.5 (6.9)	-0.825	0.411
	Absent	6.2 (7.5)		
Other Substance Use*	Present	10.7 (10.1)	1.760	0.081
	Absent	6.2 (6.9)		
Duration of Drinking†	< 5 Years	8.8 (8.3)	0.982	0.410
	6-10 Years	4.7 (5.7)		
	11-20 Years	6.3 (6.2)		
	> 20 Years	6.5 (7.7)		
Abstinence*	Yes (56)	4.9 (7.2)	7.66	0.007
	No (46)	8.8 (6.9)		

* Independent Student t Test, † One Way ANOVA Test

lapse/Dropouts) group was 42.5 years (SD = 9.4 years) with t = 0.500 and p value of 0.618. The median duration of alcohol use among the abstinent group was 16.5 years (IQR = 16.3 years) and non-abstinent group was 12.5 years (16.8 years), but the Mann Whitney U test did not reveal any statistical significance between the groups with a p value of 0.256.

Prediction of abstinence status by craving and self-efficacy

The study found that the abstinence status is statistically significant when the craving score at baseline is low (t = 7.66, p = 0.007). Abstinent group had significantly lower base line craving scores (mean PACS = 4.9) compared to Non-abstinent group (mean PACS = 8.8).

The Shapiro-Wilks test done for assessing the normality of craving scores revealed Shapiro-Wilk W value of 0.849 with a p value 0.063. No significant Associations ($p > 0.05$) were seen between baseline craving scores and education level, occupation, socioeconomic status, marital status, tobacco use, comorbid mood/anxiety disorders, other substance use and duration of drinking. The association between craving scores and clinical and sociodemographic variables are depicted in Table 2.

The decrease in craving scores of abstinent participants over time was significant at 3 months of follow up. A comparison of craving scores at baseline and at

Table 3. Post hoc analysis of RMANOVA of Penn Alcohol Craving Scale (PACS) score at baseline, 1 month, 2 months and 3 months

RM Factors		p
PACS B	PACS 1	0.032
	PACS 2	< 0.001
	PACS 3	< 0.001
PACS 1	PACS 2	0.006
	PACS 3	< 0.001

RMANOVA- Repeated Measures of ANOVA
PACS – Penn Alcohol Craving Scale
PACS B – PACS at baseline with mean value 4.9
PACS 1 – PACS at One month with mean value 1.2
PACS 2 – PACS at Two months with mean value 0.07
PACS 3 – PACS at Three months with mean value 0

the end of three months in abstinent participants using paired student t-test showed a statistically significant difference with a t value of 5.58 and $p < 0.001$.

Repeated Measures ANOVA (RMANOVA) was used to evaluate changes in alcohol craving (measured using PACS) over four time points at baseline (PACS B), 1 month (PACS 1), 2 month (PACS 2) and 3 months (PACS 3). There was a statistically significant reduction in PACS scores over time. All comparisons between baseline and subsequent months (PACS B vs PACS 1, 2, and 3) showed significant p-values ($p < 0.05$). Significant reductions were also seen between each consecutive time point: PACS 1 vs PACS 2: $p = 0.006$, PACS 1 vs PACS 3: $p < 0.001$. The RMANOVA test of craving scores at baseline, 1 month, 2 months, 3 months were also statistically significant ($F = 19.3$, $p < 0.001$). The post hoc analysis of RMANOVA is given in Table 3.

The association between self-efficacy scores and clinical and sociodemographic variables are depicted in Table 4.

Table 4. Association between sociodemographic and clinical variable with General Self Efficacy Scale (GSES) score

Clinical and sociodemographic variables		Mean GSES Scores (SD)	t/F Value	p Value
Education†	Primary	30.6 (4.9)	1.002	0.364
	High School	29.4 (3.8)		
	College & Higher	28.9 (4.6)		
Occupation†	Unemployed	28.0 (5.3)	0.294	0.829
	Unskilled labor	29.9 (4.4)		
	Skilled labor	29.5 (3.9)		
	Professional	29.0 (4.9)		
Socio Economic class*	Lower	29.6 (4.3)	-0.018	0.985
	Middle	29.6 (4.1)		
Marital Status†	Married	29.9 (4.2)	0.880	0.418
	Unmarried	28.6 (3.9)		
	Separated/Divorced	30.0 (4.6)		
Tobacco Use*	Present	29.9 (4.4)	1.327	0.187
	Absent	28.7 (3.6)		
Comorbid mood and anxiety disorders*	Present	27.5 (4.3)	3.880	< 0.001
	Absent	30.7 (3.8)		
Other Substance Use*	Present	27.7 (2.4)	-1.461	0.147
	Absent	29.8 (4.3)		
Duration of Drinking†	< 5 Years	29.0 (4.7)	1.242	0.299
	6 - 10 Years	30.6 (3.6)		
	11 - 20 Years	28.4 (4.4)		
	> 20 Years	30.1 (4.1)		
Abstinence*	Yes (56)	30.2 (4.4)	1.62	0.108
	No (46)	28.9 (3.9)		

* Independent Student t Test, † One Way ANOVA Test

It was found that participants with comorbid mood and anxiety illness were having low self-efficacy scores ($p < 0.001$). Those with comorbidities had significantly lower self-efficacy scores (mean = 27.5) compared to those without had higher scores (mean = 30.7). No significant differences in GSES scores were found across education level, occupation, socioeconomic status, marital status, tobacco use, other substance use, duration of drinking and abstinence status. An analysis of craving scores at baseline, ASSIST Score for Alcohol were done between abstinent and non-abstinent groups using Independent Student t test. The mean ASSIST score for alcohol among the abstinent group was 29.7 (S. D = 4.1) and among the non-abstinent group was 31.7 (S. D = 4.6). A significant difference was found in mean scores of ASSIST alcohol ($t = -3.097$, $p = 0.003$), craving scores at baseline ($t = -3.076$, $p = 0.003$) between abstinent and non-abstinent groups. Correlation between the age and the clinical variables related to alcohol and self-efficacy were done and found significant correlation with alcohol use in years (Spearman's rho = 0.619, $p < 0.001$ and General Self Efficacy scores (Pearson's $r = 0.297$, $p = 0.003$).

Prediction of abstinence status by comorbid mood and anxiety disorders, other substance use and sociodemographic variables

The presence of comorbid psychiatric illness ($p = 0.017$) and other substance use apart from tobacco ($p = 0.039$) had a significant association with abstinent status. 9 (8.8 %) of 102 study participants had other substance use, and at the end of 3 months follow up 7 (77.78 %) of them relapsed and only 2 (22.22 %) remained abstinent. Out of the 34 (33.3 %) participants who had comorbid mood and anxiety disorders only 13 (38.2 %) remained abstinent and 21 (61.8 %) relapsed. However, no significant association was seen between abstinence status and tobacco use ($p= 0.106$) or other sociodemographic variables.

Our study has found that the abstinence status could be predicted by lower baseline craving score, lower ASSIST score for alcohol, absence of comorbid psychiatric illness and absence of other substance use.

Discussion

Relapse following a period of abstinence can be considered a characteristic feature of addiction and should be seen as a complex phenomenon influenced by both neurobiological and psychosocial factors [15]. The current study aimed to estimate the proportion of patients with AUD remaining abstinent three months after initiation of treatment for AUD. Prediction of abstinence status by comorbid psychiatric disorders, other substance use, and sociodemographic variables were done. The role of craving and self-efficacy was also studied. A period of three months follow-up was decided upon because relapse rates were shown to be highest immediately after treatment, with the first three months having the highest risk [2,15]. There is a dearth of prospective follow-up studies determining the rate of abstinence following treatment, especially in an Asian context. Most of the studies in the literature which determined the abstinence rates excluded factors like comorbid psychiatric disorders and other substance abuse.

Out of the 102 participants, 54.9 % maintained complete abstinence for a full three months. In a study by GC M and associates. in a tertiary care centre in South India, 77.3 % remained abstinent after 3 months [25]. However, in a similar 3-month follow-up study from South India by Nair A and associates only 27.9 % remained abstinent after 3 months [3]. A heterogeneity is noted among different studies which assessed relapse rates, with the first 3 months showing a relapse rate ranging from 40 – 60 % [2]. These differences may be the result of a combination of patient-related, psychosocial, and treatment factors. In the studies by GC M and associates and Nair A and associates all patients with substance use other than alcohol and nicotine and those with any primary psychiatric disorders were excluded unlike the current study. The study by Nair A and associates does not specify the duration of inpatient treatment and the specifics of treatment, however the current study was similar to the study done by GC M and associates in terms of the number of therapy sessions. However, the specifics regarding anti-craving medications were not mentioned and the inpatient care provided was longer compared to the current study. Also, in both studies the abstinence status was assessed based on subjective reports only. Hence the differences in abstinence rates maybe the result of a combination of patient related, psychosocial, and treatment factors.

The role of craving in maintaining abstinence was also studied. Craving, defined as a strong urge to consume alcohol is commonly reported by those with AUD as the reason for not being able to maintain abstinence [26]. Chronic alcohol use has been shown to cause neuroadaptive changes in reward circuits and a reduction of frontal white matter integrity resulting in a disruption of prefrontal functioning and impaired top-down inhibition leading to heightened craving and an increased risk of relapse [26,27]. The current study showed a significant association between craving scores at the baseline and abstinence status. There was a significant reduction in craving scores in the abstinent group at the end of 3 months follow up. The RMANOVA test of craving

scores at baseline, first, second and third months also showed a significant difference. A comparison of craving scores at baseline between abstinent and non-abstinent groups also showed a statistically significant difference. Even though a significant association was found between the presence of anti-craving medications and abstinence status, no significant association was found between anti-craving medications and craving scores. This absence of a statistically significant association may be because 97 of the 102 study participants were given at least one anti-craving medication. The negative impact of craving on relapse to alcohol use shown in the current study is consistent with the findings in previous studies [28,29].

An interesting finding in the current study is that no significant association was found between self-efficacy and abstinent status. Self-efficacy has been shown as an important predictor for relapse in past studies [10,11]. However, a few studies have also reported no significant association between self-efficacy and abstinence status [30,31]. This contradiction may be due to different facets of self-efficacy measured in different studies. In the study by Ludwig F and associates self-efficacy measured by a single question about confidence to remain abstinent in one year was shown to be a significant predictor of abstinence in contrast to self-efficacy determined using Situational Confidence Questionnaire [32]. A high self-efficacy score at baseline may also be the corollary of underestimating the difficulty of remaining abstinent from alcohol and overconfidence in their ability to resist the desire to drink [33].

The presence of comorbid mood and anxiety disorders was found to be negatively affecting abstinence status in the current study. The presence of comorbid mood and anxiety disorders was also found to be associated with reduced self-efficacy in this study. The finding is consistent with previous studies which also showed comorbid mood and anxiety disorders predict an earlier time to relapse to substance use [34,35]. Previous studies show that the severity of alcohol use, comorbid nicotine use and other substance use decrease the odds of successfully maintaining abstinence [35]. The current study also shows comorbid substance use was negatively associated with abstinence. Also, a significant difference was found in severity scores for alcohol use between abstinent and non-abstinent groups. This is in agreement with previous studies which show a higher severity of alcohol use is associated with a more frequent relapse [35]. It can also be concluded from the discussion that findings of the current study resonate with similar studies conducted in western population.

A limitation of this study is the relatively small sample size and inadequate sample in other substance abuse groups. Since the status of dropouts is unknown, this should be considered a limitation of the current study as dropouts were included with the relapse group for statistical analysis. As this study was done in the Deaddiction clinic of a tertiary care hospital with all the participants having moderate to severe alcohol use, the study could have given rise to a Berksonian bias.

The unique aspect of current study is that, in contrast to previous studies which excluded many comorbid aspects, this study takes an integrated approach to exploring the impact of associated comorbidities, clinical and psychosocial factors. The study has a significant clinical relevance and highlights the importance of craving in relapse and in turn, shows the importance of anti-craving measures. The impact of comorbidities including other substance dependence and psychiatric disorders are also highlighted. Based on these findings it can be recommended that effectively addressing craving and routine screening for comorbid psychiatric diagnosis is warranted. Attention should also be given to comorbid substance abuse as it can negatively impact the prognosis. Also, given that more than 40 % of the participants could not maintain complete abstinence, future studies should also explore the effectiveness of alternative approaches such as personalized treatment strategies taking into consideration the influence of sociocultural factors and potential efficacy of controlled drinking.

To conclude, even though relapse can happen in following treatment, complete abstinence should be the target due to the long-term benefits it provides and the fact that even a small amount of alcohol can negatively impact the sensitized neural network. High levels of craving, comorbid mood and anxiety disorders, and use of other substances are major factors adversely impacting the prognosis.

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Conflict of Interest

None to declare.

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