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# Cognitive behavior therapy as an adjuvant in management of alcohol dependence syndrome

## ABSTRACT

Kalpna Srivastava,  
Jyoti Prakash,  
Pookala Shivaram Bhat,  
Kaushik Chatterjee,  
Suprakash Chaudhury<sup>1</sup>,  
Vinay Chauhan

Department of Psychiatry,  
Armed Forces Medical College,  
<sup>1</sup>Department of Psychiatry,  
Dr. D. Y. Patil Medical College,  
Dr. D. Y. Patil Vidyapeeth, Pune,  
Maharashtra, India

### Address for correspondence:

Dr. Suprakash Chaudhury,  
Department of Psychiatry,  
Dr. D. Y. Patil Medical College,  
Dr. D. Y. Patil Vidyapeeth,  
Pune - 411 018, Maharashtra,  
India.  
E-mail: [suprakashch@gmail.com](mailto:suprakashch@gmail.com)

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**Background:** Treatment of alcohol dependence is a major challenge due to frequent relapses. Cognitive-behavioral therapy (CBT) has been reported to be useful in the treatment of alcohol dependence. **Aim:** This study aims to evaluate the effect of CBT module in management of Alcohol Dependence and compare it with treatment as usual (TAU). **Materials and Methods:** All newly diagnosed alcohol dependence patients during the study period meeting the exclusion and inclusion criteria were included in the study. Patients with a head injury, HIV seropositive status, or any other organic brain disorder and comorbid psychiatric disorders were excluded. The study included 226 patients with alcohol dependence randomly assigned to intervention group ( $n = 116$ ) and TAU group ( $n = 110$ ). Demographic and clinical data were recorded and Severity of Alcohol Dependence Questionnaire was applied. Relapse was taken as an outcome variable. Both TAU group and experimental group were followed on standard protocol of treatment. **Results:** The data were analyzed and relative risk (RR) was calculated. Findings revealed the study group receiving CBT had a better outcome and relapse rate was also significantly low in the experimental group as compared to the TAU group. **Conclusion:** The RR of relapse is lower in patients of alcohol dependence on CBT within 6 months and within 1 year as compared to cases on TAU. It is recommended that CBT be used as an adjunct to treatment in alcohol dependence cases.

**Keywords:** Alcohol use disorder, cognitive behavior therapy, relapse

Alcohol abuse refers to recurrent alcohol use despite the occurrence of social, occupational, or legal problems. Symptoms include arguing with significant others about drinking, missing work or school due to being drunk or hung-over, or being arrested on alcohol-related charges, such as disorderly conduct or driving under the influence. Alcohol abuse is a current problem that can endanger an individual's health, occupational, social, and interpersonal well-being. Due to the increasing prevalence of alcohol dependence and its relapsing nature, the treatment outcome of

alcohol dependence has always been a matter of concern to all. Most studies focus on the impact of the first intervention, whether it is brief versus extended, in-patient or out-patient, or the modality of treatment. It is increasingly being identified that short-term interventions also have a long-term impact.<sup>[1-3]</sup> In the management of alcohol, it is important to look for continued abstinence. It is important to look at issues beyond just the initial treatment and study its long term effects.<sup>[4]</sup>

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Drinking as a ritual has its roots in history. The uninformed have always been described India as an abstinent culture. The reality is that alcohol use was not uncommon though social attitudes were ambivalent. Ancient Indian Texts viz. the Rig-Veda and the Yajurveda inform us about “sura,” a refined spirit, which the Kshatriyas (warriors) used to consume. All the Moghul emperors, as also Maharaja Ranjit Singh drank heavily. Despite being incorporated in the directive principles of the Constitution, most of the states failed to persist with their prohibition policies due to multiple reasons. First, it was difficult to enforce since the production and consumption went underground. Country liquor was readily available and was being consumed by all. However, due to lack of quality control liquor tragedies used to occur. Second, while a lot of police time was spent in efforts to enforce the ban, the State lost a massive amount of revenue.<sup>[5,6]</sup>

Studies carried out in Indian Armed Forces have addressed varied aspects of alcoholism. It is noted that about 20% or more of alcohol dependence cases if followed over a long period, may achieve permanent abstinence. The outcome of alcohol dependence cases is not so widely researched.<sup>[7-9]</sup> The study of the outcome of psychological treatment in the Armed Forces setup will bridge the gap in knowledge existing for the same.

The treatment of Alcohol Dependence Syndrome in Armed Forces includes forced abstinence, detoxification, individual and group psychotherapy, along with other supportive measures such as rest, nutrition, vitamins, and the treatment of associated physical/psychiatric illness. Alcohol dependence patients remain in the hospital for about a month, during which withdrawal features and other associated management of disorder are addressed. After the withdrawal features subside and related problems are managed they are discharged to their units but kept under observation. Armed forces follows a strict regimen of review and follow-up.<sup>[10]</sup> This is unique to the treatment of service personnel. Empirical explorations on drunkenness and its management corroborate that in the syndrome of alcohol dependence, relapses are the rule rather than the exception and that the greatest risk of relapse is in first half-year after treatment.

Cognitive-behavioral approaches are considered to be standard management strategies in alcohol dependence cases. Positive predictors of less relapse are high self-efficacy and confidence in high-risk situations, positive outcome expectancies, sufficient coping skills, and low craving. This leads to abstinence and prevention of relapse.<sup>[11]</sup> There are many factors which facilitate long-term recovery such as high self-efficacy, more reliance on self, and less on avoidance coping along with support from

family members and friends. The relapse was noticed in those patients more who used maladaptive coping strategies such as negative thinking and those who remained abstinent, used adaptive strategies such as “positive thinking.” There are varied psychological approaches used for treatment, including Community Reinforcement Approach and Relapse Prevention that are well delved. However, Motivational Interviewing along with cognitive behavior therapy (CBT) have yielded good results.<sup>[12-14]</sup>

Alcohol dependence treatment is aimed to achieve abstinence, reduce the frequency and severity of relapse, and thereby enhance health and psychosocial functioning of the subject. Current management protocols for alcohol dependence comprise a phase of detoxification followed by a relapse prevention (RP) phase. Presently, some treatment programs aim at controlled drinking as an initial step in the mending process. However, due to intense craving, impaired ability to control consumption, and easy access, substantial decrease in consumption is a major challenge for alcohol-dependent patients and generally leads to uncontrolled drinking. The natural course of alcohol dependence is exemplified by phases of abstinence with recurring relapse episodes. Relapse after an extended phase of abstinence is not counted as failure of therapy. It signals the need for an increased level of treatment.<sup>[15]</sup> The outcome of treatment of Alcohol Dependence patients has always been a matter of concern and challenge for mental health professionals, because of the frequent lapses and relapses. In view of the above, it was planned to evaluate the efficacy of CBT intervention in the management of Alcohol Dependence and treatment outcome on follow up.

## MATERIALS AND METHODS

This was a prospective, longitudinal, randomized control study. It was carried out at two tertiary care psychiatric centers attached to a Medical College. The research protocol was submitted to the institutional ethics committee and approval obtained prior to starting the study.

### Sample

All newly diagnosed patients meeting ICD 10 classification of mental and behavioural disorders diagnostic criteria for research (ICD10DCR) criteria for alcohol dependence admitted during the study period and meeting the inclusion and exclusion criteria were selected for inclusion in the study.<sup>[16]</sup>

### Inclusion criteria

1. Patients meeting the ICD 10 DCR criteria for Alcohol dependence syndrome
2. Age more than 18 years.

### Exclusion criteria

1. Patients with a head injury, HIV seropositive status, or any other organic brain disorder and comorbid psychiatric disorders were excluded
2. Not willing to participate in the study

### Tools

#### Demographic and clinical datasheet

This self-made pro forma was used to record particulars of patients including details of alcohol use, and outcome of the study (relapse and abstinence).

#### Severity of Alcohol Dependence Questionnaire

Severity of Alcohol Dependence Questionnaire (SADQ) assesses the severity of alcohol dependence. This 20-item questionnaire, rated on a 0–4 point scale, yields a score ranging from 0 to 60. A score of >30 indicates “severe alcohol dependence,” while a score of 16–30 indicates “moderate dependence.” It has a good test-retest reliability and concurrent validity.<sup>[17]</sup>

#### Procedure

All the patients selected for the study were informed about the objectives of the study and written informed consent was obtained. Demographic and clinical data were recorded using a self-made pro forma. The severity of dependence was rated using the SADQ. Sample consisted of 226 patients. They were randomly assigned to 116 in intervention ( $n = 116$ ) and treatment as usual (TAU) group ( $n = 110$ ). Both TAU group and experimental group were followed on standard protocol of treatment. CBT was given to the experimental group in 12 face-to-face sessions over the duration of 6 weeks. The main components of CBT were functional analysis and skills training. The experimental group received CBT and also standard treatment as given routinely. TAU group received standard treatment given to all alcohol dependence cases. It involved regular exercise supportive intervention, which was given to all the cases. The feedback on each treated patient was taken in 6 months and 1 year. An episode of relapse was defined as the patient meeting ICD10DCR criteria for alcohol dependence for a minimum period of 1 month.

### Statistical analyses

Therapeutic management was an independent variable, dependent variable was relapse in these cases. Data were analyzed on SPSS (IBM, Chicago, USA). Mann–Whitney *U*-test was used to identify differences between the two groups before treatment. Multiple regression analysis was performed to identify the predictors of relapse.

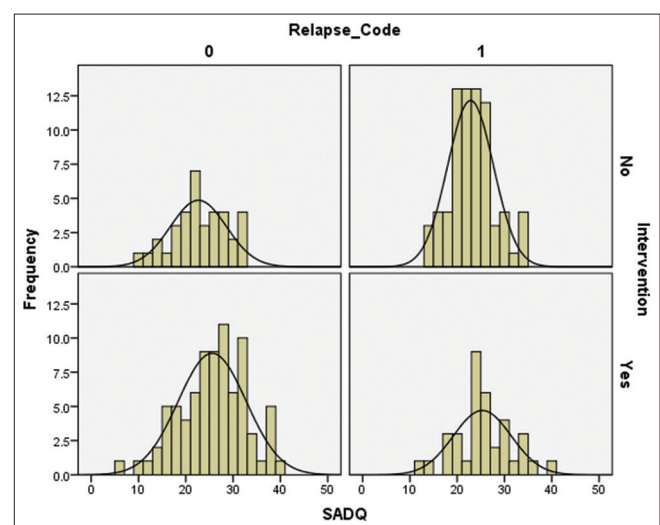
## RESULTS

The mean ( $\pm$ standard deviation) age of the patients was 36.67 ( $\pm$ 8.73) years. All the patients were male.

Demographic characteristics and substance use habits of the study population are given in Table 1. The pattern of alcohol consumption is given in Table 2. Relative risk (RR) analysis revealed that a significant difference is noted in relapse between the cases who were treated with CBT and TAU group within 6 Months. Cases in CBT group has significantly less relapse ( $n = 27$ ) as compared to TAU group ( $n = 58$ ). A total number of cases which relapsed were 85 and 141 cases out of 226 had no relapse [Table 3]. RR analysis also revealed a significant difference in relapse between the cases who were treated with CBT and TAU group at 12 months. Cases in CBT group has significantly less relapse ( $n = 33$ ) as compared to TAU group ( $n = 74$ ) [Table 3]. The experimental group had significantly higher score as compared to the control group on SADQ [Table 4]. The group with intervention had less percentage of relapse as compared to group not having intervention [Figure 1].

### Multiple regression analysis to predict relapse at 12 months

In Table 5, the *R*-value represents the correlation between the dependent and independent variable. A value >0.4 only can be considered for further analysis. The *R* value is 0.821 in the present study, which indicates a good level of prediction.  $R^2$  (the coefficient of determination) value is 0.674, which implies that independent variables explain 67.4% of the variability of our dependent variable, relapse. The Durbin–Watson value is between the critical values of 1.5 and 2.5, confirming that there is no first-order linear auto-correlation in the data. It is necessary to have a minimal difference between  $R^2$  and Adjusted  $R^2$ . In the present study, the values are .661 and .674 respectively, which is good. Therefore, the model summary table is satisfactory to proceed with further analysis.



**Figure 1:** Relapse in treatment as usual and cognitive behavior therapy group

**Table 1: Sociodemographic and clinical characteristics of the study population**

Characteristic	Total	With intervention (n=116), n (%)	Without intervention (n=110), n (%)	$\chi^2$	P
Marital status					
Married	215	110 (103.77)	105 (95.45)	0.047	0.826 (NS)
Unmarried	11	6 (5.17)	5 (4.55)		
Education					
Standard 5-10	60	25 (11.55)	35 (31.82)	3.051	0.081 (NS)
Standard 10 and above	166	91 (78.45)	75 (68.18)		
Family size					
1-3	110	58 (50.00)	52 (47.27)	0.168	0.682 (NS)
4-6	116	58 (50.00)	58 (52.73)		
Number of children					
0-2	206	106 (91.38)	100 (90.91)	0.015	0.900 (NS)
3-4	20	10 (8.62)	10 (9.09)		
Occupation					
Civil	7	1 (0.86)	7 (6.36)	5.004	0.0252 (S)
Soldier	218	115 (99.14)	103 (93.63)		
Family history of alcohol					
No	181	98 (84.48)	83 (75.45)	2.88	0.089 (NS)
Yes	45	18 (15.52)	27 (24.55)		
Alcohol consumed					
Local	1	1 (0.86)	1 (0.91)	0.202	0.903 (NS)
Rum	210	107 (92.24)	103 (93.64)		
Rum-whisky	11	8 (6.89)	6 (5.45)		
Other substance					
None	169	88 (75.86)	81 (73.64)	0.148	0.700 (NS)
Tobacco	57	28 (24.14)	29 (26.36)		

NS – Not significant; S – Significant

**Table 2: Pattern alcohol consumption**

Daily alcohol consumption	With intervention (CBT group), n (%)	Without intervention (TAU group), n (%)	Total
120/day	0 (0.9)	1 (0)	1
120 ml alternate	0 (0.9)	1 (0)	1
120 ml alternately	1 (0)	0 (0.86)	1
120 ml/day	31 (35.45)	39 (26.7)	70
120 mml/day	1 (0.9)	1 (0.86)	2
150 ml/day	1 (0.9)	1 (0.86)	2
180 ml/day	23 (20.9)	23 (19.8)	46
240 ml/day	41 (21.8)	24 (35.3)	65
300 ml/day	12 (8.18)	9 (10.3)	21
340 ml/day	1 (0)	0 (0.86)	1
360 ml/day	2 (0.9)	1 (1.72)	3
500 ml/day	1 (0)	0 (0.86)	1
60-120 ml alternately	0 (0.9)	1 (0)	1
60-120 ml/3 time/week	0 (7.27)	8 (0)	8
60-120 ml/day	2 (0)	0 (1.72)	2
90 ml/day	0 (0.9)	1 (0)	1
Total	116	110	226

CBT – Cognitive behavioral therapy; TAU – Treatment as usual

The ANOVA determines whether the model is significant enough to determine the outcome. In Table 6,  $P$  is 0.000. Therefore, the result is significant. A value of  $>1$  for F-ratio yield a useful model. In the above table, the value is 51.621, which indicates that the overall regression model is a good fit for the data. The table shows that the independent

variables statistically significantly predict the dependent variable,  $F(3,75) = 51.621, P < 0.000$  (i.e., the regression model is a good fit of the data).

The coefficient table [Table 7] shows the strength of the relationship. Consider the effect of “relapse6” in this

**Table 3: Relapse in alcohol dependence cases within 6 months and 1 year**

Intervention	Relapse, n (%)	No relapse, n (%)	Total	IR	RR (95% CI)
Relapse at 6 months					
TAU	58 (52.7)	52 (47.3)	110	0.53	2.27 (1.56-3.30)
CBT	27 (23.3)	89 (76.7)	116	0.23	
Total	85	141	226		
Relapse at 12 months					
TAU	74 (67.3)	36 (32.7)	110	0.67	2.36 (1.72-3.25)
CBT	33 (28.4)	83 (71.6)	116	0.28	
Total	107	119	226		

RR – Relative risk; CI – Confidence interval; IR – Incidence rate

**Table 4: Severity of alcohol dependence questionnaire scores in treatment as usual and cognitive behavioral therapy groups at baseline**

	Intervention	n	Mean rank	Mann-Whitney U	Asymptotic significance (two-tailed)
SADQ	TAU	110	98.04	4679.500	0.001
	CBT	116	128.16		
	Total	226			

SADQ – Severity of alcohol dependence questionnaire; CBT – Cognitive behavioral therapy; TAU – Treatment as usual

**Table 5: Multiple regression analysis for predictors of relapse in 12 months: Model summary<sup>d</sup>**

Model	R	R <sup>2</sup>	Adjusted R <sup>2</sup>	SE of the estimate	Durbin-Watson
3	0.821 <sup>c</sup>	0.674	0.661	0.28042	1.900

<sup>a</sup>Predictors: Constant, relapse 6, consumption, Edn, <sup>d</sup>Dependent variable: Relapse 12. SE – Standard error; Edn – Education

**Table 6: Multiple regression analysis for predictors of relapse in 12 months: ANOVA<sup>a</sup>**

Model	Sum of squares	df	Mean square	F	Significance
3					
Regression	12.178	3	4.059	51.621	0.000 <sup>d</sup>
Residual	5.898	75	0.079		
Total	18.076	78			

<sup>a</sup>Dependent variable: Relapse 12, <sup>a</sup>Predictors: Constant, relapse 6, consumption, Edn. Edn – Education

example. The unstandardized coefficient, B1, for Relapse 6 is equal to 0.830, which implies that for every relapse within 6 months, there is an increase of 0.830 in relapse at 1 year. The collinearity statistics allow us to check for multicollinearity in the regression model. For all variables, Tolerance should be >0.1 or Variance Inflation Factor <10, which they are. It is seen from the “Sig.” column that all independent variable coefficients are statistically significantly different from 0.

**The results of multiple regression analysis can be summarized as under**

A multiple regression analysis was performed to identify predictors of relapse at 12 months from relapse at 6 months, alcohol consumption, and level of education. These variables statistically significantly predicted relapse

at 12 months,  $F(3,75) = 51.621, P < 0.000, R^2 = 0.674$ . All three variables added statistically significantly to the prediction,  $P < 0.05$ .

**DISCUSSION**

Findings of the present study revealed the important aspect of recovery on a follow-up with CBT. The majority of patients were married and had education level 10<sup>th</sup> std and above [Table 1]. Tobacco consumption was observed in both the groups. RR analysis revealed that a significant difference is noted in relapse between the cases who were treated with CBT and TAU group within 6 months. If we compare the percentage within 6 months in the present study 52.7% of cases relapsed who were on TAU group while in the CBT group only 23.3% cases relapsed. The same trend was noted in the relapse of cases within a year. The CBT group had 28.4% of relapse rate whereas TAU group had 71.6% of relapse. This is a very important finding. This is in concurrence with a review in which data from seven large multisite studies involving 8,389 subjects was combined to estimate how effective was the treatment of alcohol dependence. Results showed that 25% of patients were abstinent and an additional 10% consumed alcohol in moderation and without problems. The remaining 65% of patients as a group also improved, with their alcohol consumption reduced, on average, by 87%.<sup>[18]</sup>

Another study demonstrated that nicotine, heroin, and alcohol produced highly analogous rates of relapse in the range of 80%–95% during follow up of 1-year, A substantial proportion (40%–80%) of patients entering alcohol use disorder (AUD) treatment programs, have a

**Table 7: Multiple regression analysis for predictors of relapse in 12 months: Coefficients<sup>a</sup>**

Model 3	Unstandardized coefficients		Standardized coefficients ( $\beta$ )	T	Significance	95.0% CI for B		Collinearity statistics	
	B	SE				Lower bound	Upper bound	Tolerance	Variable inflation factor
Constant	-1.247	0.401		-3.110	0.003	-2.046	-0.448		
Relapse 6	0.830	0.069	0.798	12.050	0.000	0.693	0.968	0.991	1.009
Consumption	0.002	0.001	0.252	3.644	0.000	0.001	0.003	0.912	1.097
Edn	0.081	0.030	0.186	2.698	0.009	0.021	0.140	0.920	1.087

<sup>a</sup>Dependent variable: Relapse 12. CI – Confidence interval; SE – Standard error; Edn – Education

minimum of one lapse during the 1<sup>st</sup> year after treatment, while only about 20% return to pretreatment amounts of alcohol use.<sup>[19]</sup> In the present study also, it was found that relapse at 6 months was a significant predictor of relapse within a year. Reducing relapses is, therefore, an important strategy to enhance long-term abstinence. RP is an approach for decreasing the probability and gravity of relapse following the termination or decrease of problematical habits.<sup>[20]</sup>

The first recurrence of the problematical habit after a quit attempt is defined as a “lapse.” This could ultimately lead to continued transgressions to a level akin to before quitting and is then called a “relapse.” Another possible outgrowth of a lapse is that the patient may regain abstinence and thus carry on his forward move in the path of positive change. CBT helps in achieving this ideal. Numerous experimenters describe relapse as a process rather than as a separate event and therefore endeavor to identify the factors contributing to relapse.<sup>[21]</sup>

Cognitive restructuring helps to confront cognitive errors such as the abstinence violation effect. The strategies to reframe and view lapses as key learning opportunity help in modifying their behavior. Craving is depicted as a cognitive occurrence focused on the wish to utilize a substance and is commonly linked to the anticipations for the coveted effect of the substance, while urge is depicted as the social intention to use a substance.<sup>[22]</sup> Craving is stimulated by both interoceptive or exteroceptive cues, environmental situations linked to previous excessive consumption of the substance, or with the emotional and somatic symptoms of earlier withdrawal encounters.<sup>[23]</sup> Associative learning, during which environmental events recurrently paired with substance intake gain incentive-motivational significance, arousing anticipation of substance availability and recollections of previous substance use bliss, is essential for craving and relapse. CBT teaches to handle these cues.

The important aspect to mention is that social support is highly predictive of long-term abstinence. The level of social support available from the most probative person in

the network may be the greatest prognosticator of lowered drinking, and the number of probative connections also strongly forecasts abstinence. Skills acquisition is helpful and road to abstinence is broken down to smaller achievable targets so that it helps in enhancing self-efficacy. It is seen that 53.6% were staying with family and in group without intervention, 54.3% were staying with family. The impact of intervention seems to be facilitating the outcome.

It is well established that alcohol use has many harmful effects on physical and psychological health. Alcohol use is rapidly growing in developing countries such as China and India, with a resulting global overall increase in alcohol use during recent years.<sup>[24]</sup> Individuals with a diagnosed AUD, i.e., those with impaired control over their alcohol consumption and who continue drinking despite serious adverse consequences are estimated to account for about half of all global alcohol-related harm in developed countries.<sup>[25,26]</sup> In particular, the risk of dying from somatic diseases such as liver cirrhosis, cancer, and cardiovascular disease is several times higher among people with an AUD.<sup>[27]</sup> Due to the monumental impact of AUD on morbidity and mortality, evidence-based treatment for the condition is imperative to health care. However, the course of alcohol dependence is often characterized by periods of abstinence with recurring periods of relapses. CBT as a part of adjuvant to TAU is indicated in alcohol dependence cases.

### Limitations

This is a hospital-based study which may limit its generalizability. The sample size was modest. Follow-up assessment only after 6 months and 1 year were other limitations. A longer follow would have established the efficacy of treatment.

### CONCLUSION

Alcohol dependence patients receiving CBT as a part of their treatment had a better outcome and relapse rate was also significantly low in the experimental group as compared to the TAU group which did not receive the CBT.

## Recommendations

It is recommended that CBT be used as an adjunct to treatment in alcohol dependence cases.

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## Conflicts of interest

There are no conflicts of interest.

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