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# Original Article

## Personality Profile and Short-term Treatment Outcome in Patients with Alcohol Dependence: A Study from South India

Soundarya Soundararajan, Gitanjali Narayanan<sup>1</sup>, Arpana Agrawal<sup>2</sup>, Pratima Murthy<sup>1</sup>

### ABSTRACT

**Background:** Studying personality profiles allows researchers to generate important hypotheses in risk factors and correlates of alcohol use/misuse. Studies examining the association between personality traits and treatment outcome are limited in India. We studied the correlation between personality and treatment outcome in patients with alcohol dependence. **Methods:** Adult participants with alcohol dependence were recruited from the inpatient and outpatient wards of de-addiction unit of a tertiary care facility in India using a prospective design and followed up after 3 months. Questionnaires administered were revised NEO personality inventory (NEO-PI-R), alcohol use disorders identification test, and advanced warning of alcohol relapse (AWARE). **Results:** Out of 99 recruited participants (92% males) with mean age of 37 ( $\pm 8.36$ ) years, 82 (82.8%) patients were followed up to 3 months. E4 (activity) facet of the extraversion domain in the NEO-PI-R significantly correlated with the baseline drinking scores ( $r = 0.204$ ,  $P = 0.042$ ,  $n = 99$ ) and AWARE scores ( $r = 0.276$ ,  $P = 0.043$ ,  $n = 54$ ). There was a significant negative correlation between the E2 (gregariousness) facet and satisfaction with life scores ( $r = -0.211$ ,  $P = 0.036$ ,  $n = 99$ ). Age at first drink was significantly lower among relapsers ( $P = 0.021$ ). **Conclusion:** Our study suggests that factors related to extraversion, specifically, high activity might be associated with higher drinking as well as higher risk of alcohol relapse. Predicting alcohol relapse by studying the personality traits would help clinicians in improving treatment outcomes.

**Key words:** Alcohol dependence, extraversion, personality, relapse, revised NEO personality inventory

### INTRODUCTION

Globally, alcohol causes 4% of all deaths and contributes 5% to the global burden of disease.<sup>[1]</sup> Alcohol

consumption has increased globally over years and India being one of the most populous countries contributes

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significantly to the alcohol-attributable burden.<sup>[2]</sup> Among 15–49-year-old men in India, the prevalence of daily and weekly use of alcohol is 9.4% and 26.7%, respectively.<sup>[3]</sup> Alcohol is attributed for 17% of the neuropsychiatric disorders among men in India.<sup>[2]</sup>

Alcohol use disorders (AUDs) are viewed as chronic remitting conditions. Studies indicate that about 80% of patients relapse within a year of detoxification.<sup>[4]</sup> Among patients under treatment, it is important to examine the factors that contribute to relapse. Sociodemographic factors such as living alone,<sup>[5]</sup> low socioeconomic status,<sup>[6]</sup> family history of alcoholism,<sup>[7]</sup> and psychosocial stressors<sup>[7]</sup> have been associated with increased risk for relapse. Aspects such as religion,<sup>[8]</sup> taking part in self-help groups,<sup>[9]</sup> and proper follow-up visits<sup>[10]</sup> tend to reduce relapse risk. Identifying specific factors contributing to relapse could pave way for optimizing treatments at the individual level.

Personality traits have found to predict treatment outcome in diseases such as obesity,<sup>[11]</sup> hyperopia,<sup>[12]</sup> and various surgical treatments.<sup>[13]</sup> In psychiatry, personality traits have been linked to depression,<sup>[14]</sup> schizophrenia,<sup>[15]</sup> and withdrawal severity in substance dependence.<sup>[16]</sup> With regard to alcoholism, the “novelty seeking” trait has been found to predict relapse in alcohol-dependent males and “harm avoidance” trait predicted early relapse in females.<sup>[17]</sup> Alcohol dependence has been associated with higher neuroticism scores and lesser conscientiousness scores.<sup>[18]</sup> In a longitudinal study, extraversion at 14 years of age predicted alcohol dependence at 30 years of age.<sup>[19]</sup>

In the Indian context, Chaudhury *et al.*<sup>[20]</sup> studied psychological aspects in alcohol-dependent individuals and showed that they had significantly high neuroticism, extroversion, anxiety, depression, and psychopathic deviation and significantly low self-esteem as compared to normal control subjects. However, there are no Indian studies to our knowledge correlating personality traits and alcohol dependence with particular reference to treatment outcome.

## METHODS

Adult participants with alcohol dependence diagnosed by Diagnostic and Statistical Manual of Mental Disorders-Fourth Edition (DSM-IV) were recruited from the inpatient and outpatient wards of a tertiary care de-addiction facility in India. From the participants who met the inclusion/exclusion criteria, sociodemographic data were obtained in the first visit. Data included age, gender, education and employment status, marital status, satisfaction with life (SWL), age at first drink, and smoking history. The study was designed to

prospectively re-assess the participants at the end of 3 months.

All patients received treatment as usual during this time. This includes pharmacological and psychosocial interventions provided by a multidisciplinary team. Pharmacological treatment was standard detoxification regimen, followed by anticraving measures and multivitamin supplements as prescribed by trained psychiatrists. At the completion of 3 months follow-up, patients were assessed for relapse/abstinence from alcohol. We defined relapse as any drink in the past 3 months and abstinence as continuous abstinence from any alcoholic beverage after the recruitment.

### Measures

Questionnaires administered at baseline were revised NEO personality inventory (NEO-PI-R), SWL, mini-international neuropsychiatric interview (MINI), and alcohol use disorders identification test (AUDIT). At 3 months, patients were followed up by direct/phone interview and assessed for relapse/abstinence. Advanced warning of alcohol relapse (AWARE) scores were obtained.

### NEO-personality inventory-revised

NEO-PI-R is the most often used tool to measure personality according to the five-factor model.<sup>[21]</sup> It has five major domains which have six facets each. Alphas for the domains range from 0.86 to 0.92 for self-report [Table 1].

### Mini-international neuropsychiatric interview

The MINI is a short-structured clinical interview which enables researchers to make diagnoses of psychiatric disorders according to the DSM-IV.

### The alcohol use disorders identification test

AUDIT is a method of screening for excessive drinking developed by the WHO. Grading is done based on the scores obtained.

**Table 1: Revised NEO personality inventory domains and facets**

Domains	Facets
Neuroticism	Anxiety, angry hostility, depression, self-consciousness, impulsiveness, vulnerability to stress
Extraversion	Warmth, gregariousness, assertiveness, activity, excitement seeking, positive emotion
Openness to experience	Fantasy, esthetics, feelings, actions, ideas, values
Agreeableness	Trust, straightforwardness, altruism, compliance, modesty, tender-mindedness
Conscientiousness	Competence, order, dutifulness, achievement striving, self-discipline, deliberation

### Advance warning of relapse

AWARE scores are a reliable and valid predictor of relapse occurrence.<sup>[22,23]</sup> It is a 28-item questionnaire assessing the warning signs of relapse, and the scores give out the probability of drinking in next 2 months based on whether they were drinking/abstinent in the last two months.<sup>[23]</sup>

### Statistical analysis

Statistical analysis was done using R software (<http://www.r-project.org/>). Spearman correlation was used for testing correlations. Chi-square test was used for analyzing the difference among relapsers and abstainers.

## RESULTS

There were 99 recruited participants with mean age 37 ( $\pm 8.42$ ) years. Fifty-four patients came for follow-up up to 3 months, and the AWARE scores were obtained from them. Telephonic interviews were attempted for those who lost follow-up. Thus, 3-month follow-up

information was available for a total of 82 (82.8%) patients, of whom three died due to alcohol-related complications and 34 maintained abstinence. We considered the 17 patients who lost follow-up and could not be interviewed through phone as relapsers. We excluded the three patients who died of alcohol-related complications from the study.

Ninety-two percent of our participants were male. Majority (81.25%) were married. Alcohol use duration, body mass index, smoking scores measured as Fagerstrom test for nicotine dependence, and SWL did not predict abstinence/relapse at 3-month follow-up [Table 2]. Family history of alcoholism was available for 85 patients, and among them, 63.53% had a positive family history. Among the 8 females included in the baseline, one died, 4 relapsed, and 3 remained abstinent. Females who relapsed had lesser age at first drink and later age of presentation when compared with females who maintained abstinence in follow-up.

**Table 2: Comparison of abstainers versus relapsers**

Variables	Total, n (%)	Relapsers	Abstainers	P
n (%)		62 (64.58)	34 (35.41)	-
Sex ratio (male/female)		19.67 (59/3)	7.5 (30/4)	0.240
Age (mean $\pm$ SD)		36.31 $\pm$ 8.42	38.06 $\pm$ 8.48	0.333
Age at first drink		20.13 $\pm$ 4.62	22.62 $\pm$ 5.57	0.021
Alcohol use (years)		16.18 $\pm$ 8.59	15.44 $\pm$ 8.25	0.685
FTND score		6.10 $\pm$ 3.10	5.29 $\pm$ 3.38	0.243
Satisfaction with life score		27.34 $\pm$ 4.22	26.56 $\pm$ 5.62	0.444
BMI		22.05 $\pm$ 3.91	22.74 $\pm$ 4.70	0.443
Audit baseline		27.63 $\pm$ 7.81	27.85 $\pm$ 7.89	0.894
Marital status (%)				
Single	12 (12.5)	8 (66.67)	4 (33.33)	0.374
Married	78 (81.25)	51 (65.38)	27 (34.62)	
Separated	3 (3.13)	2 (66.67)	1 (33.33)	
Divorced	2 (2.08)	-	2 (100)	
Widow	1 (1.04)	1 (100)	-	
Education status (%)				0.443
Illiterate	17 (17.89)	11 (64.70)	6 (35.30)	
Primary school	21 (22.10)	14 (66.67)	7 (33.33)	
Middle school	12 (12.63)	10 (83.33)	2 (16.67)	
High school	26 (27.37)	16 (61.54)	10 (38.46)	
Intermediate/posthigh school diploma	15 (15.79)	10 (66.67)	5 (33.33)	
Graduate/postgraduate	4 (4.21)	1 (25)	3 (75)	
Religion (%)				
Hindu	77 (80.20)	50 (64.94)	27 (35.06)	0.399
Muslim	6 (6.25)	3 (50)	3 (50)	
Christian	12 (12.5)	9 (75)	3 (25)	
Jain	1 (1.04)	-	1 (100)	
Socioeconomic status (%)				
Upper	3 (3.12)	2 (66.67)	1 (33.33)	0.005
Middle	28 (29.17)	16 (57.14)	12 (42.86)	
Lower	65 (67.71)	44 (67.69)	21 (32.31)	
Family history of alcoholism (%)				
Present	54 (63.53)	33 (61.11)	21 (38.89)	0.819
Absent	31 (36.47)	20 (64.51)	11 (35.48)	

FTND – Fagerstrom test for nicotine dependence; SD – Standard deviation; BMI – Body mass index

Among our study group, there was a significant difference between the relapsers and abstainers ( $P = 0.005$ ) with regard to the socioeconomic status. Majority belonged to the lower class (67.71%), among whom 67.69% relapsed. All three patients who had current diagnosis of social anxiety disorder relapsed ( $P = 0.025$ ), and 60% of patients with moderately high suicidal thoughts relapsed ( $P = 0.006$ ). The mean age at first drink among relapsers was 20.13 ( $\pm 4.62$ ) and was significantly lower compared to the mean age at first drink of abstainers ( $P = 0.021$ ).

In our study group, there was no significant difference in NEO-PI-R domain and facet scores between relapsers and abstainers [Tables 3 and 4]. E4 (activity) facet of the extraversion domain in the NEO-PI-R significantly correlated with the baseline drinking scores ( $r = 0.204, P = 0.042, n = 99$ ) and AWARE scores ( $r = 0.276, P = 0.043, n = 54$ ) [Figures 1 and 2]. There was a significant negative correlation between the E2 (gregariousness) facet and SWL scores ( $r = -0.211, P = 0.036, n = 99$ ). There was no significant personality traits associated with the dropouts.

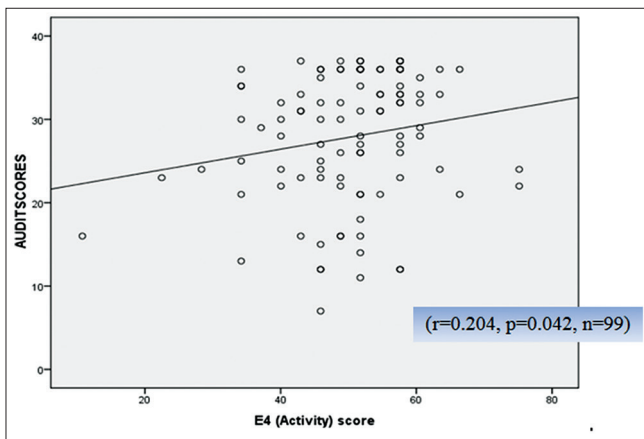
## DISCUSSION

Although personality factors have been well correlated with substance use,<sup>[18,24]</sup> studies linking personality and treatment outcomes are scarce, especially with regard to AUDs. In this context, we examined the relation between personality domains based on the

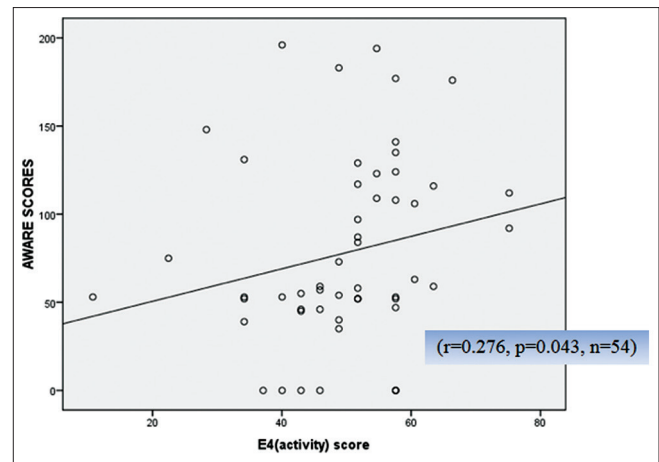
big five model, with the treatment outcomes in treatment-seeking alcohol-dependent patients.

Earlier studies established a correlation between problem drinking and the personality domains, especially with the extraversion.<sup>[18]</sup> In our study, after controlling for age, gender, age at first drink, SWL, smoking, marital status, and socioeconomic status, E4 facet (activity) of the extraversion domain correlated significantly with the baseline AUDIT scores ( $r = 0.204, P = 0.042, n = 99$ ) and AWARE scores ( $r = 0.276, P = 0.043, n = 54$ ). This suggests that people who score high on extraversion tend to be more involved in drinking. Higher risk for relapse as measured by AWARE scores might be associated with the severity of initial drinking. However, in our study group, the correlation between the baseline AUDIT scores and follow-up AWARE scores was not significant ( $r = 0.138, P = 0.320, n = 54$ ). Thus, the risk for relapse appears to be associated with higher activity facet of the extraversion domain rather than the heavy drinking at the baseline.

The increased risk for relapse among people who have impulsive suicidal attempts in the past has been documented.<sup>[25]</sup> Among our study group, 3/5 patients who had moderately high suicidal ideations relapsed. Social anxiety disorder is an important comorbid illness often found among alcohol-dependent patients. Over one-third of the patients diagnosed with social phobia have AUDs in their lifetime.<sup>[26]</sup> In our



**Figure 1:** Correlation between E4 (activity) domain and alcohol use disorders identification test scores



**Figure 2:** Correlation between E4 (activity) domain and advanced warning of alcohol relapse scores

**Table 3: Revised NEO personality inventory T-scores -relapsers versus abstainers**

Group	NEO-PI-R T-scores				
	Neuroticism	Extraversion	Openness	Agreeableness	Conscientiousness
Relapsers	49.73±10.41	49.68±10.54	49.52±10.29	49.52±10.22	49.41±10.20
Abstainers	50.52±9.45	50.5±9.22	50.91±9.64	50.73±9.86	50.89±9.75
<i>P</i>	0.717	0.707	0.517	0.575	0.492

NEO-PI-R – Revised NEO personality inventory

population, all three patients with social phobia at baseline relapsed at 3 months. Therefore, attention should be given to those people with the past suicidal ideations and comorbid social phobia when treating for alcohol dependence.

There was a significant negative correlation between the SWL scores and the E2 (gregariousness) facet ( $r = -0.211$ ,  $P = 0.036$ ,  $n = 99$ ). Thus, among people with alcohol dependence, it can be construed that people who tend to be more sociable and less satisfied

**Table 4: Revised NEO personality inventory domain and facet scores – relapsers versus abstainers**

Domains	Facets	Treatment outcome	T-scores (mean±SD)	P
Neuroticism	N1 - anxiety	Abstainers	50.74±9.15	0.714
		Relapsers	49.97±10.03	
	N2 - angry hostility	Abstainers	51.09±9.74	0.477
		Relapsers	49.55±10.36	
	N3 - depression	Abstainers	50.32±9.21	0.856
		Relapsers	49.92±10.59	
	N4 - self-consciousness	Abstainers	50.88±10.82	0.530
		Relapsers	49.53±9.62	
	N5 - impulsiveness	Abstainers	49.93±9.00	0.906
		Relapsers	50.19±10.67	
	N6 - vulnerability to stress	Abstainers	49.73±9.78	0.930
		Relapsers	49.92±10.09	
Extraversion	E1 - warmth	Abstainers	51.36±9.00	0.336
		Relapsers	49.28±10.64	
	E2 - gregariousness	Abstainers	51.66±9.49	0.240
		Relapsers	49.11±10.43	
	E3 - assertiveness	Abstainers	50.60±9.87	0.622
		Relapsers	49.54±10.19	
	E4 - activity	Abstainers	47.78±9.23	0.110
		Relapsers	51.22±10.38	
	E5 - excitement seeking	Abstainers	48.70±8.07	0.322
		Relapsers	50.84±11.00	
	E6 - positive emotion	Abstainers	51.82±9.67	0.149
		Relapsers	48.75±10.02	
Openness to experience	O1 - fantasy	Abstainers	51.31±9.53	0.333
		Relapsers	49.21±10.39	
	O2 - esthetics	Abstainers	50.09±9.82	0.965
		Relapsers	50.00±10.25	
	O3 - feelings	Abstainers	50.52±9.76	0.776
		Relapsers	49.91±10.23	
	O4 - actions	Abstainers	51.76±8.86	0.225
		Relapsers	49.16±10.52	
	O5 - ideas	Abstainers	50.72±10.25	0.564
		Relapsers	49.48±9.98	
	O6 - values	Abstainers	50.55±10.17	0.676
		Relapsers	49.65±10.04	
Agreeableness	A1 - trust	Abstainers	50.80±9.38	0.558
		Relapsers	49.53±10.56	
	A2 - straightforwardness	Abstainers	51.44±10.13	0.251
		Relapsers	48.97±9.95	
	A3 - altruism	Abstainers	50.04±9.33	0.997
		Relapsers	50.05±10.54	
	A4 - compliance	Abstainers	50.78±10.28	0.626
		Relapsers	49.74±9.90	
	A5 - modesty	Abstainers	50.72±11.04	0.577
		Relapsers	49.50±9.60	
	A6 – tender-mindedness	Abstainers	50.07±8.92	0.857
		Relapsers	49.68±10.67	

*Contd...*



**Table 4: Contd...**

Domains	Facets	Treatment outcome	T-scores (mean±SD)	P
Conscientiousness	C1 - competence	Abstainers	50.27±10.14	0.792
		Relapsers	49.69±10.16	
	C2 - order	Abstainers	50.95 ±9.42	0.392
		Relapsers	49.13±10.19	
	C3 - dutifulness	Abstainers	50.16±10.81	0.965
		Relapsers	50.07±9.44	
	C4 - achievement striving	Abstainers	52.15±10.11	0.132
		Relapsers	48.91±9.95	
	C5 - self-discipline	Abstainers	51.26±10.01	0.363
		Relapsers	49.31±9.95	
	C6 - deliberation	Abstainers	49.90±8.152	0.944
		Relapsers	49.74±10.99	

SD – Standard deviation

with their lives tend to cope up with substances. There was a significant difference in the age at first drink among relapsers and abstainers with relapsers having lesser age at first drink.

## CONCLUSION

Our study suggests that factors related to extraversion, specifically, high activity might be associated with higher involvement in drinking as well as higher risk for early relapse. Our study also suggests that substance use could be one of the ways of coping up among people who are more sociable people and yet less satisfied with their lives. People with comorbid social anxiety disorders and suicidal ideations should be given more focus as they tend to relapse to alcohol. Our study also suggests that earlier the age of first drink, higher is the relapse risk. This has important implications for alcohol control policies and tailoring treatment needs for the patients.

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### Conflicts of interest

There are no conflicts of interest.

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