

## Socio-Demographic Characteristics, Perceived Contributory Factors and Personality Profiles of Alcohol and Opioid Users in Southern Assam

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### Introduction

Substance abuse comprises a broad spectrum of disorders with multi-etiological factors affecting an individual's life in every domain (physiological, psychological, emotional, occupational, and social).

It is a global problem with a huge disease burden leading to the loss of significant DALY's, amounting to 18% of total DALY loss due to mental and behavioural illnesses [1]. Socioeconomic and health hazards resulting from substance abuse are intensified due to low levels of socioeconomic development in India. The prevalence of harmful use and dependence syndrome for alcohol have been estimated to be 2.5% and 2.7% of the general population respectively in India. Similarly 0.25% of Indian population suffers from cannabis dependence, 0.70% of Indians need help for their opioid use problems, 0.2% need help for sedative use problems [2].

Starting during adolescence, substance abuse peaks in lifetime prevalence in emerging adults or young adulthood [3-7]. A small subset of "serious users" shows a tendency to continue until cumulative ill effects lead to health or legal complications [8]. This poses a threat to wellbeing of this highly potential yet very much vulnerable demographic group of the society. It is prudent to take into account the factors that contribute to initiation and subsequent continuation of substance use.

Substance abuse has been identified as a disorder with multitude of determinants often influencing its development at multiple levels ranging from the psychosocial to the genetic. One prominent among these factors are personality dimensions. Various studies have explored the association of these dimensions with substance use, often trying to establish a predictive role of personality traits in a lifetime development of substance abuse. Hierarchical models of personality traits like the five-factor model have been utilized to explore such relationships. Using this model some studies have characterized alcohol abusers to have high levels of neuroticism and low levels of agreeableness and conscientiousness [9-14]. Higher neuroticism and lower conscientiousness have been found to characterize individuals abusing opioids [15]. Other researchers have studied finer details of an individual's traits by using scales like the 16PF. With a robust scientific basis in theories of individual

differences this questionnaire has found utility in various settings including clinical, research, academic and industrial [16]. The sixteen primary-level traits assessed by this scale have been found to be better predictors of an individual's behaviour [17-20].

The Barak valley, presumably due to its peculiar geographic location and trade relations has witnessed a high prevalence of illicit substance abuse apart from abuse of common substances like alcohol. But there is a scarcity of studies on the sociodemographic aspects of this problem. Beyond the sociodemographic domain, there is also a dearth of studies on the personality factors associated with substance use, and the factors associated with the initiation and continuation of substance use in this population. In this study, we aimed to explore the factors that the substance users perceive as contributing to the initiation and continuation of their substance use and aimed to assess the personality traits of the substance-using individuals and examine if there is any difference in the personality profiles of the two group of substance users, namely alcohol users and opioid users. These need to be studied, which should inform any future attempts at preparing strategies at the clinical setting as well as the policy-making level to deal with this problem.

### Aims and Objectives

- To explore the sociodemographic profiles of the individual's using substance
- To explore the factors that the substance users perceive as contributing to initiation and continuation of their substance use
- To assess the personality traits of the substance using individuals and to examine if there is any difference in the personality profiles of two group of substance users, namely alcohol users and opioid users.

### Methods and Materials

It was a cross-sectional study conducted at Department of Psychiatry, Silchar Medical College and Hospital, Silchar. The duration of the study spanned from July 2019 to June 2021. The study subjects were chosen from among the patients attending the department of Psychiatry, Silchar Medical College & Hospital in an outpatient basis or admitted in the indoors or patients attending

the opioid substitution therapy centre within the premises of the hospital. Forty consecutive patients from each substance use group who fulfilled the inclusion and exclusion criteria attending the department were selected as study subjects after obtaining written informed consent. Ethical clearance was obtained from the Institutional Ethics Committee of Silchar Medical College and Hospital vide letter no -SMC/98/07/5984 dated 20/05/2020. We have used purposive sampling technique and 40 subjects were selected in each group following the inclusion and exclusion criteria.

#### **Inclusion Criteria**

- Patients in the age range of 18–60 years
- Patients who had been diagnosed as having dependence syndrome for a psychoactive substance (alcohol or opioid) diagnosed according to ICD-10 guidelines, and were abstinent from use of the substances for at least 1 month at the time of assessment without experiencing any withdrawal symptoms
- Patients with a minimum educational level of primary schooling
- Patients giving informed consent

#### **Exclusion Criteria**

- Any major co-morbid debilitating physical illness, and mental retardation
- Patients with a prior diagnosis of any major psychiatric disorders, other than substance use disorder, such as schizophrenia and other psychotic disorders, mood disorders, anxiety disorders including OCD, substance induced psychotic and mood disorders, or any organic mental disorder.

#### **Tools Used**

- A semi-structured proforma designed and standardized in the department of Psychiatry was used to gather sociodemographic details. The proforma was used also to collect additional data regarding factors perceived by the patients as contributing to onset and continuation of substance use.
- Substance abuse disorder was diagnosed in accordance with the International Classification of Disease-10 (ICD-10) diagnostic guidelines. The diagnostic subcategories of harmful use, substance dependence syndrome, substance withdrawal syndrome with or without complicated or uncomplicated delirium were included in the study.
- Sixteen personality factor was used to assess the personality traits of the subjects. It comprises of a set of 185 self-scored questions. Originally designed in 1949 by Raymond B. Cattell, Maurice Tatsuoka and Herbert Eber, it underwent 4 further revisions, with the latest revision being made in 1993 [21]. It contains 185 questions with possible responses of “yes”, “no”, or “can’t say”. A minimum educational level of primary schooling (formal education for at least 5 years) is required to effectively respond to the questions and takes around 30-45 minutes to complete. Based on the responses, raw scores are obtained for 16 independent primary personality traits which were originally arrived at by factor analysis of hundreds of possible human personality traits. These raw scores are then

presented on a standard-ten scale and sten scores are obtained. Sten score for a trait can range from 1 to 10. A score of 5 or 6 is regarded as normative average score, scores 1-3 as low, score 4 as low average, scores 8-10 as high, and score 7 as high average. The traits are bipolar, with lower scores representing one extreme and higher scores the other extreme. The scale has an internal consistency ranging from 0.66 to 0.86, and test-retest reliability ranging from 0.69 to 0.87. For our purpose, the Indian adaptation in Hindi authored by S. D. Kapoor was utilized [22].

#### **Analysis of Data**

Analysis was done by descriptive and inferential statistics; statistical significance being set at  $p < 0.05$ . Chi-squared test or Fisher’s exact test were used to compare discreet variables and independent samples t-test was used to compare means of continuous variables between two groups. Data analysis was performed using IBM SPSS version 21.

#### **Results**

Table 1 shows the comparative sociodemographic profiles of the study subjects. All the study participants were found to be males. The mean age of the two groups of substance abusers did not differ significantly (35.73 (7.968) VS 34.73 (7.456);  $P = 0.564$ ). However, they differed significantly in the age at which they were exposed to the respective substance for the first time (Alcohol group 18.60 (2.649) vs opioid group 30.80 (7.753)  $P < 0.001^{**}$ ). As evident, first exposure to alcohol was at a significantly earlier age than to opioids. However, the mean age at which dependence patterns to the substances developed did not differ significantly between the two groups (28.53 (5.870) vs 31.00 (7.673);  $p = 0.109$ ). There was a significant difference in the mean duration of dependence between the two groups (7.2 (4.238) vs 3.73 (1.710);  $p < 0.001$ ). This indicates that care is sought for the management of substance abuse much earlier in the case of opioid abuse than in the case of alcohol abuse.

Religion-wise, marital status-wise, and educational status-wise, the two groups did not differ significantly from each other. However, there was a clear pattern of difference in the demographic variable of the place of residence between the two groups. The opioid abusers were predominantly urban inhabitants ( $n = 33$  (82.5%)) while the alcohol users were predominantly rural ( $n = 26$  (65%));  $p < 0.001^{**}$ .

The alcohol users were predominantly daily wage earners ( $n = 17$  (42.5%)) or farmers ( $n = 9$  (22.5%)), while the opioid users were predominantly self-employed individuals engaged in small businesses or driving (27 (67.5%)). This difference in occupation was found to be highly statistically significant ( $p < 0.001^{**}$ ). The opioid user group was found to be economically and socially well off in comparison to the alcohol users as evident in the differences in monthly family income ( $p = 0.003$ ) as well as in their socioeconomic status ( $p < 0.001$ ) as assessed by the Revised Kuppuswamy scale.

**Table 1: Sociodemographic Profile**

		Alcohol	Opioid	p
Age	Age range	24-52	21-52	
	Mean age	35.73 (7.968)	34.73 (7.456)	0.564
	Median age	34.50	34	
	Mean age at first intake	18.60 (2.649)	30.80 (7.753)	<0.001
	Mean age of onset of dependence	28.53 (5.870)	31.00 (7.673)	0.109
	Duration of dependence pattern	7.2 (4.238)	3.73 (1.710))	<0.001
Religion	Hinduism	31 (77.5%)	22 (55%)	0.058
	Islam	9 (22.5%)	17 (42.5%)	
	Christianity	Nil	1 (2.5%)	
Residence	Rural	26 (65%)	7 (17.5%)	<0.001
	Urban	14 (35%)	33 (82.5%)	
Marital Status	Unmarried	8 (20%)	16 (40%)	0.191
	Married	30 (75%)	22 (55%)	
	Divorced	2 (5%)	2 (5%)	
Education	Primary schooling	4 (10%)	2 (5%)	0.346
	Middle and Highschool	31 (77.5%)	28 (70%)	
	Higher secondary and above	5 (12.5%)	10 (25%)	
Occupation	Unemployed	6 (15%)	4 (10%)	<0.001
	Daily wage earner	17 (42.5%)	5 (12.5%)	
	Farmer	9 (22.5%)	Nil	
	Self-employed	6 (15%)	27 (67.5%)	
	Salaried professional	2 (5%)	4 (10%)	
Monthly Family Income	Less than 10000	11 (27.5%)	3 (7.5%)	0.003
	10000-25000	22 (55%)	17 (42.5)	
	Above 25000	7 (17.5%)	20 (50%)	
Socioeconomic Status	Lower	3 (7.5%)	Nil	<0.001
	Upper lower	8 (20%)	3 (7.5%)	
	Lower middle	28 (70%)	28 (70%)	
	Upper middle	1 (2.5%)	9 (22.5%)	

We tried elucidating the factors that the study subjects perceived as leading to the initiation as well as maintenance of their substance use. As presented in table 2, Peer pressure (n=22 (55%) and n=19 (47.5%)) and curious volition (n=8 (20%) and n=17 (42.5%)) were cited by the majority in both substance groups. A minority in each group perceived the influence of a substance-using family member as the factor leading to their own initiation of substance use. Another minor subset of substance users in both groups cited that they initiated substance as a means to deal with stressful life situations.

Unlike perceiving a single factor leading to the initiation of substance use, many of the study subjects perceived multiple factors to be at play in the continuation of their substance use. Around 2/3rds of alcohol users cited the easy availability of alcohol as a major factor (n=26 (65%)). Continuation of alcohol use as a recreational, pleasurable activity was cited by 2/5ths of the respondents. Again, 40% (n=16) responded that they continued alcohol use to ward off the withdrawal symptoms. Another 40% (n=16) mentioned continued alcohol use as a means to cope with life stresses. Around 27.5% (n=11) of the respondents cited the fear of rejection by peer users as a factor contributing to their own alcohol use. Avoidance of withdrawal symptoms turned out to be an almost universal factor leading to the continuation of opioid use as reported by 95% (n=38) of the opioid users. Easy availability was another factor that was cited by 40% (n=16) of opioid users. The continued use of opioids to cope with stress, to avoid peer rejection, or as a recreational activity was perceived by a minority of opioid users.

**Table 2: Factors Perceived to Influence Initiation and Continuation of Substance Abuse**

		Alcohol	Opioid
Initiating Factors	Curiosity	8 (20%)	17 (42.5%)
	Peer pressure	22 (55%)	19 (47.5%)
	Family influence	4 (10%)	2 (5%)
	Coping with stress	6 (15%)	2 (5%)
Continuation Factors	To avoid withdrawal symptoms	16 (40%)	38 (95%)
	For pleasure	16 (40%)	2 (5%)
	Easy availability	26 (65%)	16 (40%)
	Fear of peer rejection	11 (27.5%)	3 (7.5%)
	Coping with stress	16 (40%)	6 (15%)

In table 3 we are comparing the sten scoring pattern for the 16PF primary traits. A score of 5 or 6 was considered average. Scores ranging from 1 to 3 were considered low scores and a score of 4 was a low average, while scores ranging from 8 to 10 were as high and a score of 7 was a high average. It was seen that there was a propensity for lower scores in traits E (Dominance)(n= 23; (57.5%) and n= 31; (77.5%)), H (Social boldness)( n= 22; 55% and n=30; (75%)), and Q3 (Perfectionism) (n=20; 50%; and n=27; (67.5%)) in both substance user groups. On the other hand, both the groups displayed a propensity for higher scores for trait N (Privateness) (n=23; (57.5%) and n= 31; (77.5%)). Differences were significant between groups in their scoring pattern for the traits B (Reasoning) (p=0.002), C (Emotional stability) (p<0.001), G (Rule consciousness) (p=0.039), M (Abstractedness) (p=0.013), N (Privateness) (p=0.047), and Q1 (Openness to change) (p<0.001). Thus, the higher number of opioid users turned out to be having average abstract reasoning capability and problem-solving skills (B), lesser emotional stability (C), more expedience and less rule consciousness (G), lesser abstractedness (M), high privateness and less self-disclosing (N), and an average openness to change (Q1).

**Table 3: Comparison of Scoring Pattern for the 16PF Traits between Alcohol Users and Opioid Users**

	Alcohol			Opioid			p
	Low or Low Average	Average	High or High Average	Low or Low Average	Average	High or High Average	
A	13 (32.5%)	19 (47.5%)	8 (20%)	21 (52.5%)	16 (40%)	3 (7.5%)	0.114
B	7 (17.5%)	29 (72.5)	4 (10%)	Nil (0%)	27 (67.5%)	13 (32.5%)	<b>0.002</b>
C	15 (37.5%)	25 (62.5%)	Nil (0%)	32 (80%)	8 (20%)	Nil (0%)	<b>&lt;0.001</b>
E	23 (57.5%)	17 (42.5%)	Nil (0%)	31 (77.5%)	9 (22.5%)	Nil (0%)	0.094
F	11 (27.5%)	29 (72.5%)	Nil (0%)	19 (47.5%)	20 (50%)	1 (2.5%)	0.066
G	8 (20%)	28 (70%)	4 (10%)	19 (47.5%)	18 (45%)	3 (7.5%)	<b>0.039</b>
H	22 (55%)	18 (45%)	Nil (0%)	30 (75%)	10 (25%)	Nil (0%)	0.050
I	8 (20%)	31 (77.5%)	1 (2.5%)	8 (20%)	29 (72.5%)	3 (7.5%)	0.769
L	8 (20%)	21 (52.5%)	11 (27.5%)	3 (7.5%)	22 (55%)	15 (37.5%)	0.222
M	1 (2.5%)	32 (80%)	7 (17.5%)	10 (25%)	25 (62.5%)	5 (12.5%)	<b>0.013</b>
N	Nil (0%)	17 (42.5%)	23 (57.5%)	Nil (0%)	9 (22.5%)	31 (77.5%)	<b>0.047</b>
O	Nil (0%)	24 (60%)	16 (40%)	Nil (0%)	26 (65%)	14 (35%)	0.818
Q1	23 (57.5%)	17 (42.5%)	Nil (0%)	7 (17.5%)	22 (55%)	11 (27.5%)	<b>&lt;0.001</b>
Q2	4 (10%)	31 (77.5%)	5 (7.5%)	2 (5%)	26 (65%)	12 (30%)	0.152
Q3	20 (50%)	20 (50%)	Nil (0%)	27 (67.5%)	12 (30%)	1 (2.5%)	0.110

Q4	Nil (0%)	26 (65%)	14 (35%)	23 (57.5%)	17 (42.5%)	Nil (0%)	0.647
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The means of the sten scores were calculated and a t-test was applied to compare the mean scores between the two groups. Table 4 shows the results obtained. The mean scores of both the groups for the traits Emotional stability (C), Dominance (E), Liveliness (F), Social boldness (H), and Perfectionism (Q3) were less than the presumed normal average score of 5 or 6. On the other hand, both groups showed higher than normal average scores for Privateness (N), Apprehension (O), and Tension (Q4).

Looking at the between-group differences, it was found that the opioid users scored significantly higher in Reasoning (B), Openness to change (Q1), and Self-reliance (Q2) than the alcohol users. Alcohol users, on the other hand, turned out to score significantly higher in Emotional stability (C), Rule consciousness (G), and Abstractedness (M) in comparison to opioid users.

**Table 4: Comparison of Mean Scores for 16PF Items between Alcohol Users and Opioid Users**

16-PF Factors	Mean Sten Scores (±SD)		P-Value (t-test)
	Alcohol	Opioid	
A Warmth (Reserved – Warm)	5.00 (±1.649)	4.45 (±1.413)	0.113
B Reasoning (Concrete – Abstract)	5.23 (±0.862)	6.10 (±0.810)	<0.001
C Emotional Stability (Emotionally Reactive – Stable)	4.70 (±0.883)	3.53 (±1.012)	<0.001
E Dominance (Deferential – Dominant)	4.13 (±1.159)	3.70 (±1.043)	0.089
F Liveliness (Serious – Lively)	4.83 (±0.813)	4.38 (±1.334)	0.072
G Rule Consciousness (Expedient – Rule Conscious)	5.30 (±0.966)	4.55 (±1.339)	0.005
H Social Boldness (Shy – Socially bold)	4.23 (±1.143)	3.85 (±0.949)	0.114
I Sensitivity (Utilitarian–Sensitive)	5.15 (±0.949)	5.23 (±1.025)	0.735
L Vigilance (Trusting – Vigilant)	5.68 (±1.309)	6.15 (±1.145)	0.088
M Abstractedness (Grounded – Abstracted)	5.83 (±0.813)	5.30 (±1.137)	0.020
N Privateness (Forthright – Private)	6.80 (±1.114)	7.03 (±0.832)	0.309
O Apprehension (Self-Assured – Apprehensive)	6.38 (±0.838)	6.28 (±0.933)	0.615
Q1 Openness to Change (Conservative – Open to Change)	4.00 (±1.301)	5.65 (±1.406)	<0.001
Q2 Self-Reliance (Group Oriented – Self-Reliant)	5.63 (±0.952)	6.13 (±1.114)	0.034
Q3 Perfectionism (Tolerates Disorder – Perfectionist)	4.48 (±0.784)	4.10 (±1.081)	0.080
Q4 Tension (Relaxed – Tensed)	6.33 (±0.694)	6.35 (±0.770)	0.879

## Discussion

The present hospital-based cross-sectional study examined the factors that substance users perceive as contributing to the initiation and continuation of their substance use, as well as the personality traits of substance users and whether alcohol and opioid users differ. Our findings showed that all participants were male, which may be due to the social stigma associated with substance abuse among women. The average alcohol user was a married male in his thirties from a rural background, earning bread as a daily wager, with a middle or secondary education, and from the lower middle socioeconomic stratum. However, a typical opioid user was a married male in his thirties from an urban background, self-employed, with intermediate or secondary schooling, and from a lower middle socioeconomic stratum. These results are similar to Gauba and Aswal [23,24]. Some research claim prolonged alcohol usage affects employment and relationships [25,26].

The average alcohol user started drinking out of peer pressure and curiosity and continued due to its ease of access, enjoyable effects, and withdrawal-nulling impact. However, a typical opioid user was exposed to opioids by peer pressure and curiosity and pushed to use them to avoid withdrawal symptoms. Mellos et al. connected alcohol problems to sensation-seeking violence, impulsivity, and psychoticism [27]. Donadon and Osorio employed NEO revision of the five psychological components to show that the alcoholic group scored lower on openness, agreeableness, conscientiousness, extraversion, and neuroticism [28].

Our 16PF participants are emotionally unstable, deferential, submissive, sober, socially shy, private, apprehensive, and tensed with disorder tolerance (lower scores for components C, E, F, H, Q3; higher values for N, O, Q4).

Research on substance abusers' personalities using 16PF has yielded mixed results. Drug abuse patients scored significantly lower for B, C, H, I, M, and Q1, and higher for N and Q2, according to Lavelle et al. [29].

Donadon and Osorio found extraversion was the best indicator of alcoholism [28]. According to Cloninger, personality affects alcoholism severity. Gender affects the severity of AUD and three temperamental qualities (Reward Dependency, Avoidance of Damage, and Search for Novelty) [29].

Alcohol consumers were also traditional and attached to the familiar (lower Q1). Opioid users demonstrated stronger reasoning, non-conformity, scepticism, and solitary seeking (B, L, Q2). Previous investigations partially corroborated our findings. Erasmus observed that substance users scored lower than normal for A, B, and C, higher than average for boldness, and average for E, F, G, I, and L [30]. Niazi et al. observed that male substance abusers scored lower on openness to change, self-reliance, and perfectionism than non-abusers. They rated much higher on tense personality [25].

Alcohol users additionally showed the trait of being traditional and attachment to the familiar (lower Q1). Opioid users demonstrated stronger reasoning, non-conformity, scepticism, and solitary seeking (B, L, Q2). In this regard, Gupta discovered that addict and non-addict study subjects had similar mean sten scores. After the t-test, differences were clear. The addicts scored significantly higher for components A, F L and lower for H and Q3. Substance users are more easygoing, warm-hearted, emotionally expressive, joyful, active, carefree, mistrusting, daring, venturesome, undisciplined, and unconcerned with social demands than non-users [32].

Choudhury found alcohol users low on components B, C, and G (intelligence utility, emotional strength and reactivity, and superego strength). They scored much higher for L, M, O, and Q4 (suspicious, imaginative, worrisome, high ergic tension) [33].

Habibi et al. found significant differences ( $p < 0.005$ ) between substance users and non-users in all 16PF factors except factor B [34].

In a 16PF study in central rural India, alcohol dependence syndrome patients had warmth, dominance, social boldness, tender-mindedness, suspiciousness, experimenting, perfectionism, sobriety, dependability, forthrightness, and honesty ("unpretentious"). Higher scores on components A, E, H, I, L, Q1, and Q3; lower scores on F and N; average scores on B, C, G, M,

O, Q2, Q4 represented these qualities [35].

There has been little meta-analysis of 16PF personality profiles of substance users in recent decades. Spotts and Shontz found a consistent pattern in their thorough meta-analysis. Substance users regularly rated lower than normal on emotional stability (factor C) and higher than average on apprehension. This is consistent with our findings.

A review by Belcher et al. found that people with low positive emotionality/extraversion, high negative emotionality and neuroticism, and low constraint are most susceptible to substance use disorders [36]. Hofer et al. proved the 16PF's second-order five-factor structure robust. The second-order components were extraversion (vs introversion), anxiety (vs ego strength), control (vs uncontrolled), independence (vs reliance), and sensitive awareness. Different combinations of the 16 fundamental components yield these. Our study sample showed introversion (low F, low H, high N), significant anxiety (low C, high O, high Q4), and lack of constraint [37]. Therefore, Belcher et al. and our findings coincide.

It's possible that variances in population, sampling factors, sample features, diagnostic standards, and assessment procedures are to blame for these inconsistencies between current and prior research' personality profiles of substance users.

The relationship between personality pathology and the severity and effects of substance use remains unclear. The course of substance use disorder is less favourable when there is concurrent personality pathology, which is evidenced in increased consumption, early onset of problems, and more criminal social and professional repercussions of drinking [27]. It would suggest that certain personality traits play a significant part in the progression of addictive behaviors like alcoholism. In order to lessen the severity of this clinical condition, it is necessary for these aspects to be addressed throughout the intervention.

## Conclusion

The alcohol and opioid users seeking healthcare in a government tertiary care centre have been found to be a socioeconomically vulnerable group belonging to the prime of their potentially productive decades of life. They perceive peer pressure and own curiosity as the predominant factors leading to initiation of substance use, while citing the stress or withdrawal symptom nullifying effect, pleasure inducing effect, as well as the easy availability of the substances as factors contributing to continuation of substance use. Their personality traits tend to be characterized prominently by emotional instability, submissiveness, shyness, deference, privateness, apprehension and tension. The differences in traits between the two groups lie in the alcohol users being more conservative, while the opioid users being more non-conformist, skeptical, and solitude seeking. To conclude, the substance users have been found to be introvert individuals with high anxiety and low self-restraint.

## Limitations

The current study was limited by the relatively small number of participants as well as the lack of a control group with healthy volunteers. As the study was conducted in a government funded tertiary care centre, the study findings are not generalizable to the general population. The study included individuals with a minimum abstinence duration of one month and personality was assessed on one setting only. A previous study has shown the possibility of personality traits tending to change after more than

six months of rehabilitation [38]. Therefore, the findings of the 16PF assessment may not be conclusive. Another limitation may lie in the use of the 16PF questionnaire itself. Researchers have often noted that 16PF has limitations in differentiating among individuals with psychopathologies despite its great utility in assessing normally adjusted individuals. It was also noted that there is possibility of the questionnaire being prone to manipulation by the respondents for impression management [39,40].

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