



## The assessment of personality dimensions, tobacco smoking and depression among treatment-seeking male alcoholics

Procena dimenzija ličnosti, pušenja duvana i depresije kod lečenih muških alkoholičara

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### Abstract

**Background/Aim.** The co-occurrence of depression and tobacco smoking among treated alcoholics is frequent, but understudied. Some findings suggest that there are some shared etiological factors, but a few clinical researches of personality dimensions among patients with these comorbidities were done. The personality dimensions, the pattern of cigarette use and depression and correlation of personality and depression among inpatient alcoholics were explored. **Methods.** One hundred primary male inpatient alcoholics were consecutively recruited. The eighty-six of them completed study and were compared with 30 age-matched, healthy male subjects. A semi-structured clinical interview related to sociodemographics, the pattern of cigarette and alcohol use and family history data was applied. According to cut-off on the Hamilton Depression Rating Scale (HDRS), the alcoholics were divided into depressive and non-depressive subgroups resulting in half of alcoholics in each subgroup. The Eysenck personality questionnaire (EPQ) was completed. Student's *t*-test for differences and Pearson's test for correlation were used. **Results.** There

were no significant sociodemographic differences between groups. Alcoholics were more frequent smokers (86% vs. 50%). They did not start drinking earlier, but they started smoking earlier, with higher daily cigarettes use than controls. On average, alcoholics had mild depression after detoxification. The personality dimensions did not show differences between groups, except neuroticism. The neuroticism showed significantly higher level among alcoholics vs. controls ( $12.72 \pm 5.19$  vs.  $5.00 \pm 3.36$  respectively) and among depressive vs. non-depressive alcoholics ( $15.07 \pm 4.89$  vs.  $10.37 \pm 4.40$  respectively). The depression correlated only with neuroticism ( $r = 0.487$ ,  $p < 0.001$ ). **Conclusions.** The majority of detoxified alcoholics were smokers who started smoking earlier, with mild depression and higher neuroticism compared to controls. Our results suggest that the alcoholics with high neuroticism may experience higher depression and may require more intensive integrative treatment.

**Key words:** alcoholism; men; smoking; depression; neurotic disorders; comorbidity.

### Apstrakt

**Uvod/Cilj.** Kod lečenih alkoholičara česta je, mada nedovoljno ispitana, udružena pojava depresije i pušenja cigareta. Neke studija pokazuju da postoje zajednički etiološki faktori kod bolesnika sa navedenim komorbiditetom, ali su dimezije ličnosti retko istražene. U radu su ispitane dimenzije ličnosti, depresija, obrasci upotrebe alkohola i cigareta, kao i povezanost dimenzija ličnosti i depresije kod hospitalizovanih alkoholičara. **Metode.** U studiju je bilo uključeno 100 konsektivno hospitalizovanih alkoholičara. Ispitivanje je završilo 86

alkoholičara koji su bili poređeni sa trideset zdravih, kontrolnih ispitanika. Ispitanici su bili muškog pola, upareni po starosti. Sociodemografski podaci, obrasci upotrebe alkohola i cigareta i podaci iz porodične anamneze prikupljeni su pomoću semistrukturisanog upitnika. Posle četiri nedelje apstinencije, alkoholičari su na osnovu cut-off skora na Hamiltonovoj skali za depresiju (HAMD) razvrstani u dve grupe: depresivni i nedepresivni alkoholičari. U svakoj grupi se nalazila polovina ispitanika. Primenjen je Ajzenkov upitnik ličnosti (EPQ). Međugrupne razlike ispitane su pomoću Studentovog *t*-testa, a korelacije pomoću Pearson-ovog testa. **Rezultati:** Nije bilo značajnih

sociodemografskih razlika između grupa. Alkoholičari su češće pušili više cigareta dnevno nego kontrolni ispitanici (86% vs. 50%). Alkoholičari nisu ranije počeli da piju, ali su ranije počeli da puše, sa većim brojem cigareta dnevno nego kontrolni ispitanici. Nakon detoksikacije alkoholičari su imali depresiju koja je bila prosečno blagog stepena. Osim neuroticizma, nije bilo razlike u dimenzijama ličnosti između grupa. Neuroticizam je bio značajno veći kod alkoholičara u odnosu na kontrolne ispitanike ( $12.72 \pm 5.19$  vs.  $5.00 \pm 3.36$ ) i kod depresivnih u odnosu na nedeprativne alkoholičare ( $15.07 \pm 4.89$  vs.  $10.37 \pm 4.40$ ). Depresija je bila

značajno povezana samo sa neuroticizmom ( $r = 0.487$ ,  $p < 0.001$ ). **Zaključak.** Većina detoksikovanih alkoholičara su pušači, ranije počinju da puše, depresivni su u blagom stepenu i imaju visok neuroticizam u poređenju sa kontrolnim ispitanicima. Naši rezultati ukazuju na to da alkoholičari sa visokim neuroticizmom mogu razviti težu depresiju i zahtevati intenzivnije integrativno lečenje.

#### **Ključne reči:**

**alkoholizam; muškarci; pušenje; depresija; neurotski poremećaji; komorbiditet.**

## **Introduction**

There is increasing interest of researchers and clinicians in heterogeneity of alcohol dependent patients, especially of those with comorbid conditions. The findings from epidemiological study on the prevalence of lifetime alcohol dependence was 12.5% and the prevalence of nicotine dependence among alcoholics (Alc) was 45%, which is over two times higher than in general population<sup>1</sup>. Smoking is a major health issue in persons with a lifetime history of depression who are twice as likely to smoke as those who do not suffer from depression<sup>2</sup>. Co-occurrence of mental disorders, such as alcohol use disorders (AUD), major depression, and nicotine dependence are increasingly common among patients in the clinical settings but understudied and present challenges for treatment<sup>3</sup>.

The complex, self-sustaining relationship between alcohol and tobacco dependence and depression is partly explained by self-medication attempt by a person who may smoke or drink to alleviate depression<sup>4</sup>. On the contrary, the long-term use of alcohol and nicotine can decrease levels of brain serotonin production and thus might worsen depression<sup>5</sup>. The comorbidity of alcoholism and depression is high and may be related to effects of alcohol on neurotransmitters involved in mood regulation, but nicotine has been demonstrated antidepressant effects due to counteracts alcohol-induced depression in preclinical as well as clinical studies<sup>6</sup>. This interaction may also be a contributory factor to drinking-smoking comorbidity<sup>7</sup>. Post-treatment depressive symptoms are related to shorter periods of abstinence and more frequent drinking<sup>8</sup>.

Comorbidity of alcohol dependence with other substance abuse appears as a part to unique etiology factors underlying each substance use disorder. However, comorbidity of alcoholism with anxiety, mood and personality disorders were explained by shared aetiological factors, but a few clinical studies of personality traits among patients with these comorbidities were done<sup>9</sup>.

Some researches reported that smoking behavior in general population is linked to personality traits and negative emotionality, but it is unknown whether these traits are related to alcoholics who smoke<sup>10</sup>. Previous research has indicated that specific relations exist between individual personality traits and alcoholism<sup>11</sup>. Exploration of these complex associations among drinking, smoking and

depression is important because depression can complicate comorbid alcohol and nicotine dependences by exacerbating the negative affect during early abstention from one or both drugs<sup>12</sup>.

The aim of this study was to explore the personality traits, cigarette smoking and depression among treatment-seeking Alc and correlations between personality traits and depression.

## **Methods**

### *Subjects and procedures*

The cross-sectional study was performed at the Clinic for Psychiatry of the Military Medical Academy (MMA), Belgrade. The sample included consecutively recruited 100 treatment-seeking male inpatient Alc, aged between 25 and 60 years. The total final sample consisted of 86 Alc who completed study. Inclusion criteria were alcohol dependence syndrome diagnosed according to the Diagnostic and Statistic Manual of Mental Disorders (DSM)-IV (American Psychiatric Association, 1994)<sup>13</sup>. They were assessed at a baseline and compared to 30 age-matching male controls (Cont) which were consecutively recruited among persons undergoing periodical routine examination in the MMA. All subjects received complete medical, neurological and psychiatric examinations to confirm good health condition. Exclusion criteria for Alc were any other current DSM-IV Axis I diagnoses assessed by the Structured Clinical Interview for DSM-IV, a history of significant medical illness, the use of other psychotropic drugs or substances except for tobacco smoking. Control subjects did not meet current or lifetime abuse or dependence criteria for alcohol or any other illicit drug and Axis I psychiatric diagnosis according to structured clinical interview (SCID).

All participants were explored for demographic characteristics, the patterns of alcohol and cigarette use, the family history, personality dimensions and depression. In additional analysis, the Alc were reassessed for depression after 4 weeks of in-patient treatment and were categorized into depressive (Ad) and non-depressive (And) subgroup. The 50% of total Alc were scored above cut-off score on Hamilton Depression Rating Scale<sup>14</sup> (HDRS) resulting in 43 subjects in each subgroup. The subgroups were compared for baseline characteristic.

All subjects signed written informed consent prior entering the study and all study procedures were approved by the Local Ethics Board.

### Measures

On the baseline, a trained psychiatrist interviewed subjects by semi-structured clinical interview for collecting sociodemographic characteristics, the patterns of alcohol and cigarette use and family history data. The pattern of alcohol use included the alcohol use in years, the drink number per week for the past year and the number of treatments. The smoking status was evaluated by years of daily smoking and daily cigarettes number. The family history of alcoholism and depression (FH+) was explored.

Michigan alcoholism screening test (MAST)<sup>15</sup> is 25-items screening tool for alcohol use disorder. The cut-off score sum, MAST score < 3, is related to no alcohol use disorder.

Depression was assessed by independent trained rater who applied the 21-item HDRS<sup>14</sup>. The HDRS is semi-structured interview which score sum ranges from 0 to 63 and indicates condition with no depression (scored 0–7) and 3 degrees of depression severity: the mild depression (scored 8–16), moderate depression (scored 17–24), and severe depression (scored 25 to 63).

The personality dimensions were measured by self-administered Eysenck Personality Questionnaire (EPQ)<sup>16</sup>. The EPQ consists of 90 true-false self-descriptive items and covers 4 dimensions: extraversion/introversion (E), neuroticism (N), psychoticism (P) and control (C) or lie scale. The neuroticism refers to the stability/instability dimension of personality and assesses the general emotional over-responsiveness, anxiety and worrying. Extraversion describes sociable, uninhibited personality. The psychoticism is related to more bizarre personality characteristics, such as being distant, cold, insensitive, absurd, and unable to empathize with others. The control, lie scale highlights the social desirability and it was introduced later in an attempt to measure to what extent subjects were deliberately attempting to control their scores<sup>17</sup>.

### Statistics

For all variables, descriptive statistics was applied and data expressed as mean  $\pm$  standard deviation (SD). The difference between groups was estimated by the Student's *t*-test and  $\chi^2$  test. Correlation was tested by Pearson's correlation coefficient. SPSS for Windows was used and the *p* values of 0.05 or below were defined as statistically significant.

### Results

#### The differences between alcoholics and controls

Demographic data did not show significant differences between groups.

The mean age ( $\pm$  SD) of the Alc and control subjects (Cont) was 43.29 ( $\pm$  7.32) years and 43.33 ( $\pm$  7.10) years, respectively (*t* = 0.028; n.s.). The groups were similar in terms of years of education: Alc vs. Cont – 13.72  $\pm$  1.95 vs. 13.47  $\pm$  2.28, n.s.; 83.7% of Alc and 93.3% of Cont subjects were married.

The significant difference for MAST score between Alc (19.01  $\pm$  10.64) and Cont (1.30  $\pm$  1.12) was found (*t* = 15.192, *p* < 0.01). The majority of Cont were social healthy drinkers (90%) and only 10% were sober non drinkers. The Alc smoked cigarettes more frequently (86.01%) than the Cont (50%).

The data from the pattern of alcohol use and cigarettes use were presented in Table 1.

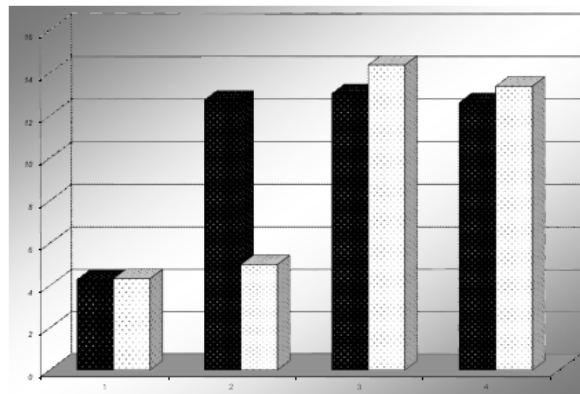
While Alc and healthy Cont did not differ in years of drinking, the group of Alc had more lifetime smoking in comparison with the healthy Cont. The Alc consumed more drinks and more cigarettes daily (Table 1). The Alc had significantly more frequent family history of alcoholism, but not of depression and suicide in comparison with the Cont (Table 1).

The personality traits assessed by the EPQ showed significant difference only for neuroticism which was more prominent among Alc vs. Cont 12.72  $\pm$  5.19 vs. 5.00  $\pm$  3.36 (*t* = 9.292; *p* < 0.01). There were not significant differences in other personality dimensions (Figure 1).

**Table 1**  
The patterns of alcohol drinking and cigarettes smoking and family history (FH+) between the alcoholics and controls

Parameters	Alcoholics	Controls	<i>t</i> ( $\chi^2$ )	<i>p</i>
	$\bar{x} \pm$ SD	$\bar{x} \pm$ SD		
Years of alcohol use	25.47 $\pm$ 8.35	26.40 $\pm$ 8.64	-0,367	n.s.
Alcohol units <i>per</i> week	65.52 $\pm$ 27.49	4.20 $\pm$ 5.53	19.585	< 0.01
Max alcohol units <i>per</i> occasion	13.93 $\pm$ 5.04	2.57 $\pm$ 1.72	18.114	< 0.01
Daily cigarettes number	27.91 $\pm$ 17.29	14.17 $\pm$ 14.39	3.903	< 0.01
Years of smoking	20.20 $\pm$ 10.46	11.93 $\pm$ 12.26	3.297	< 0.01
FH+, % (n)				
FH+ for alcoholism	67 (77.9)	8 (26.7)	25.554	< 0.01
FH+ for depression	8 (9.3)	0 (0)	2.997	n.s.
FH+ for suicide	9 (10.5)	5 (16.7)	0.806	n.s.

n.s. – non-significant;  $\bar{x}$  – mean; SD – standard deviation.



**Fig. 1 – Personality dimensions assessed by Eysenck personality questionnaire (EPQ) among alcoholics and controls.**

1 EPQ Psychoticism                      3 EPQ Extraversion  
 2 EPQ Neuroticism                      4 EPQ Control scale (lie)  
 ■ alcoholics                                      □ controls

The Alc were depressed. The mean HDRS sum score was  $15.37 \pm 6.20$  for the Alc and  $1.43 \pm 1.55$  for the Cont with significant difference between groups ( $t = 19.219, p < 0.01$ ). The mean HDRS sum scores for the Ad and And subgroups at a baseline was  $18.67 \pm 5.60$  and  $12.07 \pm 4.89$ , respectively ( $t = -5.822, p < 0.01$ ).

*The differences between depressive and nondepressive alcoholics*

The Ad had longer lifetime of smoking and more number of treatments comparing to And near statistical

significance difference, but there was no difference in daily cigarettes smoking (Table 2).

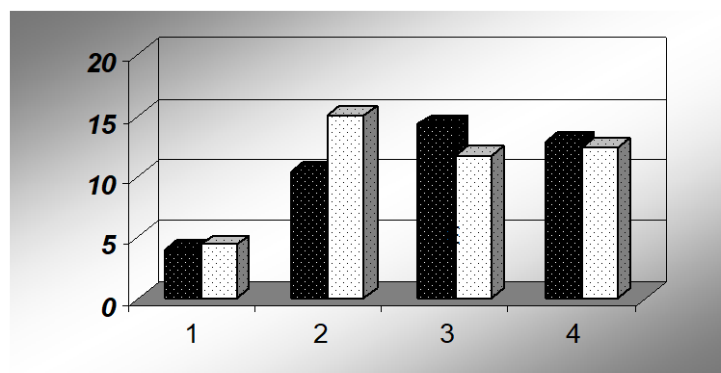
The personality traits differences between Ad and And subgroups showed that only for the control (lie) scale there was no significant difference. The most prominent difference was higher neuroticism among Ad vs. And  $15.07 \pm 4.89$  vs.  $10.37 \pm 4.40$ , respectively ( $t = -4.684, p < 0.01$ ). Ad had lower extraversion and higher psychoticism than And ( $p < 0.05$ ) (Figure 2).

Relationship between personality dimensions and depression measured in Ad recorded the positive and significant correlation between the mean HDRS sum score

**Table 2**  
**The pattern of cigarettes smoking and alcoholism, the number of treatment and MAST score differences between the non-depressive (And) and depressive (Ad) alcoholics**

Parameters	And (n = 43)	Ad (n = 43)	t	p
	r ± SD	r ± SD		
Daily cigarettes number	$27.21 \pm 16.27$	$28.60 \pm 18.43$	-0.372	n.s.
Years of smoking	$18.1 \pm 10.46$	$22.28 \pm 10.16$	1.872	0.065
Number of treatment	$1.14 \pm 0.41$	$1.37 \pm 0.66$	- 1.968	0.052

MAST – The Michigan Alcoholism Screening Test; r – mean; SD – standard deviation.



**Fig. 2 – The personality dimensions assessed by Eysenck personality questionnaire (EPQ) among depressive and nondepressive alcoholics.**

1 EPQ Psychoticism                      3 EPQ Extraversion  
 2 EPQ Neuroticism                      4 EPQ Control scale  
 □ non- depressive alcoholics  
 ■ depressive alcoholics

and the EPQ Neuroticism dimension ( $r = 0.487$ ;  $p < 0.001$ ), without significant correlation between other EPQ dimensions and depression. Analysis of relations between each EPQ dimensions showed only negative correlation between Neuroticism and Extraversion ( $r = -0.310$ ;  $p < 0.05$ ).

## Discussion

This study explored the male alcoholics personality and sociodemographic heterogeneity in early alcohol recovery. The gender and individual differences may impact susceptibility to AUD and other addictions. However, the majority of studies included mainly male subjects and gender was not taken into consideration in the analysis<sup>18</sup>. In this paper all participants were male, and there were no significant demographic differences between the groups. The majority of Cont were social drinkers (90%) and 50% of them were daily smokers. Among Alc 86% were smokers and they smoked more cigarettes daily than Cont. These findings were in concordance with previous research in which smoking prevalence was estimated in 80% of Alc in the clinical samples<sup>19</sup>.

Early age at onset is an index of high liability to illness and may increase risk of illness in relatives in many biomedical disorders<sup>20</sup>. The age when alcohol was used for the first time was reported as a risk factor for the development of the AUD<sup>21</sup>. In this paper the Alc had significantly longer duration of lifetime smoking than the Cont, which means that they started smoking earlier in adolescence with almost two-fold higher number of daily cigarettes use than the Cont. Nicotine addiction problems developed rapidly in adolescents and it was most expressed in vulnerable persons who had other substance use disorders or psychiatric illness. These findings are of interest since psychiatric comorbidities are associated with less favorable prognosis<sup>22</sup>.

There is growing interest in research and treatment of comorbid AUD and tobacco dependence. Some investigations showed that alcoholics-smokers have greater dependence severity than non-smokers suggesting careful assessment of both on admission<sup>23</sup>. Alcoholics-smokers evidenced shorter alcohol treatment duration and poorer outcome comparing to their non-smoking counterparts<sup>24</sup>. The debate about treating tobacco dependence during early alcohol abstinence have been going on. Some researches showed that concurrent treatment did not increase risk of alcohol relapse and suggested that integrating smoking cessation services in treatment program during early alcohol remission are needed to enhance smoking cessation outcomes in this population<sup>25</sup>.

The family history of alcohol dependence among first-degree relatives was significantly more frequent among the Alc (77.9%) comparing to the Cont (26.6%). The male gender and FH+ in the AUD inherited high risk factors which contribute to heterogeneity of Alc<sup>26,27</sup>. Also, adult psychopathology was proposed as risk factors for the AUD,

especially depression, anxiety and personality disorders<sup>28</sup>. Nicotine dependence is considered as a general marker of psychiatric comorbidity and the patients suffering from alcohol and nicotine dependence should be carefully assessed for other mental disorders<sup>29</sup>. There are findings that negative affect is a strong relapse predictor<sup>30</sup>. The association of smoking and depression, explored in researches, showed that former smoking and persistent smoking could predict all depression dimensions<sup>31</sup>. On the baseline, the total Alc sample revealed the average mild depression score compared to normal mood level among the Cont and after 4 weeks of abstinence the half of Alc (Ad subgroup) showed persistent depression according to cut-off score on the HDRS. The findings from general population survey suggested that gender and measurements were the key issues in interpreting the relationship between depression and alcohol. This relationship was stronger in women than in men only when major depression diagnosis was measured, but not when only recent depressed affect was measured<sup>32</sup>.

When exploring drinking pattern in 3 urban Eastern European populations it was found that drinking problem was associated with approximately two-fold increase of risk for depressive symptoms in both sexes<sup>33</sup>. The central serotonergic [5-hydroxytryptamine (5-HT)] function was related to alcohol dependence between both genders with positive family history of alcoholism. Among them the gain-of-function of serotonin transporter polymorphisms (5-HTTLPR) genotype was related to higher score of depression and neuroticism, so that this may contribute to a compensatory drinking for these affective tendencies<sup>34</sup>. For comorbid alcoholism and smoking, various explanations were provided including genetics, pharmacodynamic and pharmacokinetic interactions such as rewarding and mood effects<sup>35</sup>. Chronic heavy alcohol use may precipitate depressive-like behavior, however nicotine may block the depressogenic effects of alcohol<sup>6</sup>. The early recovery Alc with comorbid depression were in higher risk for tobacco smoking for mood modulation than Alc without depression<sup>36</sup>. The depression was associated with relapse to drinking and there was a need for early recognition and concurrent treatment among Alc<sup>25</sup>. Individual differences may have an impact on susceptibility to addiction<sup>37</sup>. Neuroticism was useful marker of non-specified general risk for common mental disorders and it was a product of genetic and environmental factors with heritability estimated range from 40% to 60%<sup>38,39</sup>. In this paper, the EPQ personality dimensions did not express significant differences between the Alc and Cont groups except for neuroticism which was more than two-fold scored higher among Alc. However, the depressive alcoholics subgroup was characterised by significantly higher neuroticism and psychoticism, but lower extraversion when compared to the non-depressive alcoholics. The most prominent differences were registered for neuroticism which was three-fold vs. two-fold higher among Ad vs. And compared to Cont ( $15.07 \pm 4.89$  vs.  $10.37 \pm 4.40$  vs.  $5.00 \pm 3.36$ , respectively). These results were consistent with findings of other researches that the alcohol dependent patients showed high neuroticism, extroversion, anxiety, depression as com-

pared with the healthy control subjects<sup>10,38</sup>. The alcohol-dependent patients also obtained significantly higher scores on neuroticism dimension<sup>40</sup>. This indicated that they were significantly more emotional, frequently anxious and/or depressed, moody and tense. Similar results were reported in earlier studies<sup>18</sup>.

Exploring the relationship between personality dimensions and depression among Ad, it was showed that only neuroticism significantly correlated with depression ( $r = 0.487$ ;  $p < 0.001$ ). Other authors suggested that since depression in male Alc was more related to neuroticism, strategies for tailored stress or mood management would be useful<sup>38</sup>. The researches of association between alcoholism and personality reported that the persons with high neuroticism/negative emotionality may be the most vulnerable to alcoholism<sup>41</sup>. Furthermore, in this paper the results indicated negative correlation between neuroticism and extraversion, without significant differences in other personality dimensions. The prominent extraversion was characterized by sociability, activity, assertiveness and under-arousal, thus substance use disorders may be considered as a form of stimulation<sup>42</sup>.

The expression of personality traits may be influenced by other factors, thus potentially biasing the results. The gender differences in personality traits across cultures showed significantly higher impulsivity and lower neuroticism among men than women<sup>43</sup>. Also, the age of participants should be taken into consideration because a personality may not be fully established before the age of 30 years<sup>37</sup>. In this paper all subjects were middle aged male, so the gender and age differences did not influence the

personality traits results. When consider personality vulnerability and depression among Alc there was a need to take into account the previous research which suggested that treatment-seeking Alc often had greater alcohol-related problems and psychiatric distress than those who did not seek treatment<sup>28</sup>.

There are several limitations of the findings in this study. The cross-sectional design used relatively small sample, thus the observed differences in personality traits do not provide explanation whether they are the causes or consequences of alcohol dependence development. Furthermore, the inpatients are likely to have more severe psychopathology and comorbidities comparing to general population. Also, patients' personality traits scores were not pre-morbid, and chronic AUD may modify the assessment of personality traits. The larger prospective study with both gender subjects is needed for further research of complex interplay between alcoholism, tobacco smoking, depression and personality traits. Thus, these findings might inform early interventions and treatments that target Alc at risk for developing persistent depression in the early alcohol recovery.

### Conclusion

These findings showed that male Alc significantly earlier started smoking more daily cigarettes and were significantly more depressive, with prominent neuroticism compared to healthy subjects. The primary male treatment-seeking alcoholics characterised with higher neuroticism may experience persistent depression, thus requiring more intensive interventions and relapse prevention approaches.

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