

Temperament and character of patients with alcohol toxicity during COVID -19 pandemic

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Abstract

Background

Corona virus pandemic acts as a stressor or trauma that affects both physical health and mental health. People exhibited various reactive behaviors to confront with this stressful situation. Alcohol consumption for coping motive was one of the most common techniques. Personality factors evidently influence alcohol consumption, since they are associated with drinking motives. The main purpose of this study is to investigate the correlation between temperament and character and alcohol abuse.

Methods

This cross-section study was conducted on 135 alcohol toxicity patients admitted to emergency room in March 2020 and 255 participants who were randomly selected from public in Shiraz. The questionnaire consisted of TCI (Temperament and character inventory) and several questions about COVID-19 pandemic. It was completed by a trained interviewer using the matched answer technique. Demographic factors were also self-reported.

Results

Among the participants, 216 were males (55.4%) and 174 females (44.6%). The mean age of the participants was 32.88 ± 13.49 years. Alcohol toxicity was mostly observed among the young males (male/female ratio was 6.45). Mean scores of novelty seeking, harm avoidant, and self-transcendent were higher in the alcohol toxicity group than normal population ($P < 0.01$). Mean scores of reward dependent, cooperativeness, and self-directedness were higher in normal population than the alcohol toxicity group ($P < 0.001$). The mean score of persistence was not significant in both group ($P = 0.718$).

Conclusion

Novelty-seeking and self-transcendence scores were higher and reward-dependency score was lower among the alcohol abusers and cooperativeness and self-directedness scores were lower among the alcohol abusers. Higher novelty-seeking was correlated with higher impulsiveness, exploratory excitability, extravagance, and disorderliness, which are included in Cluster B personality disorders and associated with alcohol and drug involvement. Lower self-directedness and lower cooperativeness indicate the higher likelihood of personality disorders. Cluster A personality disorder symptoms (in particular, schizoid personality disorder symptoms) are correlated with low reward-dependence scores.

Background

COVID-19 (Corona virus disease-2019) Pandemic is an international public health concern. By June 29, 2020, it affected more than 10,021,40 persons, with 499,913 recorded deaths [1]. On 19 February 2020, Iran reported its first confirmed cases of infections in Qom [2]. With rapid increase of the virus at the time of this report on June 29, 2020, Iran was among the top 10 countries reporting COVID-19, with more than 222,669 total confirmed cases [1]. According to a report by Shiraz University of Medical Sciences, since June 29, the COVID-19 disease infected more than 12786 cases in Fars Province, Iran; however, the deaths from the rapidly-spreading disease exceeded 159 patients.

Despite the warning reports on mental health disorders, psychiatric morbidities and behavioral problems during and after similar outbreaks in the past [3], the growing number of COVID-19 cases as well as the unprepared health services have necessitate further efforts to understand the epidemiology, clinical features, transmission patterns, and management of COVID-19 pneumonia [4]. The coincide of these problems with sustained international pressures from economic sanctions have interrupted timely mental healthcare measures [5]; hence, people are more vulnerable to various emotional distress and mental health problems [4, 6].

People exhibited various reactive behaviors to confront with this stressful situation. Some have revealed reasonable behaviors under these conditions; however, a majority of individuals showed maladaptive behavioral responses. Although there are controversies regarding the role of alcohol in removing stress, among these dysfunctional responses, alcohol consumption was reported as one of the most common stress coping methods in this situation in Iran. This has lead to alcohol toxicity epidemic as co-occurring rapidly emerging epidemic besides COVID-19 and thus making syndemics where the one has stimulated the increase of the other [7–10].

There are severe restrictions on the production and preparation of alcohol in Iran because alcohol consumption is prohibited in Islam. Accordingly, bootleg alcohol is available on the black market provided by smuggling and illegal domestic output (under non-standard conditions) [11, 12]. Shortly after the Coronavirus outbreak, different preventive measures were introduced, a majority of which had no scientific basis and were inefficient [13]. For example, with the spread of COVID-19 in Iran, there has been a rumor indicating that drinking or gargling alcohol is effective in preventing or treating the viral pneumonia [14]. Following an official report on the first cases of COVID-19 in Iran (February 26) and with the spread of this rumor, many patients were immediately admitted to the emergency ward, who were intoxicated by bootleg alcohol consumed to prevent this disease. About four weeks later, Iran experienced an outbreak of alcohol toxicity [14]. The startling official stats of more than 3100 methanol toxicity cases and 728 deaths were reported throughout the country from the first official announcement of deaths due to COVID-19 on February 19, 2020 through April 7, 2020 based on Iran's Health Ministry Spokesman and Iran legal Medicine (LMO) [15]. According to SoltaniNejad (2020), these alcohol toxicity outbreaks were reported in 18(58%) out of 31 provinces in Iran [16]; amongst them, Fars province had the highest level of toxicity [16].

In their Motivational Model of Alcohol Use [17], Cox and Klinger suggested that drinking motives are the most proximal antecedents of alcohol use [17, 18]. According to a large number of studies, the most widely accepted theory to motivate the consumption of alcoholic beverages is underpinned by the role of an interplay between emotional and rational processes, according to which a person makes decisions whether or not to drink alcoholic beverages [19]. These decisions are made based on the affective changes of personal experience, situations, and expectancies [20]. Following previous research addressing the chemical effect of alcohol on the social consequences, there is various motives for drinking alcohol, including social motives videlicet peer acceptance, enhancement motives for drinking to have fun, and coping motives (i.e., tension reduction or distress coping) [18, 20]. Besides, It is evident that other variables such as personality factors evidently influence alcohol consumption as they are associated with drinking motives [21, 22]. As a result, we believe that it is essential to investigate the relationship between personality character and alcohol-related outcomes with regard to the drinking motives [23, 24].

In this report, we assert that majority of patients who were admitted due to alcohol toxicity consume alcohol for distress coping motive. As we previously mentioned, personality factors evidently influence alcohol consumption, since they are associated with drinking motives. In this context, we tried to investigate and compare the temperament and character of 135 admitted patients with diagnosis of alcohol toxicity and 255 of normal population who never had used alcohol.

Methods

This cross-section study was conducted on 135 participants in March 2020, who were admitted because of alcohol toxicity to the emergency ward in hospitals affiliated to Shiraz University of Medical Sciences, Shiraz, Iran. Inclusion criteria for the alcohol toxicity group were no history of psychiatric and neurologic complaints, at least elementary education, and admission to the emergency room because of alcohol toxicity. Some interviews were conducted with patients just after detoxification when their condition became stable according to the physicians' report. The patients and their companions, who signed written informed consent, were invited for psychological evaluation. The interviewees were allowed to leave the interviews whenever they wished. The questionnaire was completed by a trained interviewer using the matched answer technique. Demographic factors such as gender, age, level of education, marital status, and economic status were also self-reported.

In addition, 255 participants were randomly selected from general public in Shiraz. Due to restrictions on commuting during COVID-19 pandemic, face-to-face interviewing was not possible. Thus, random phone numbers were collected from Shiraz' phone directory and the questionnaire was completed via phone interviews conducted by the same trained interviewer. The inclusion criteria for the normal population group was not consuming alcoholic beverages, no history of psychiatric and neurologic complications, at least elementary education. All the participants provided their verbal informed consent.

All the participants completed the Persian version of the Temperament and Character Inventory-125 (TCI). This scale was developed by Cloninger[25] to evaluate personality traits in seven dimensions. Four dimensions are Novelty seeking (NS), Harm avoidant (HA), reward dependence (RD), and Persistence (PS) (known as “Temperament”), and the other three dimensions are Cooperativeness (CO), Self-directedness (SD), and Self-transcendence (ST) (known as “Character”). The scale was translated into Persian – a native language in Iran – and validated for Iranian population by Kaviani and Poornaseh [26]. In addition, several yes/no self-report questions were also raised regarding the participants’ belief in the beneficial effect of alcohol in preventing and treating COVID-19 and whether they have received news about this subject or not. Moreover, multiple-choice questions about reasons of alcohol consumption (for prevention of COVID-19, habitual consumption or recreational consumption), amount of consumed alcohol (more than once a week, maximum of three times per month and maximum of 6 times per year) and the effect of COVID-19 and the effect of commute restrictions on the alterations of amount of consumption (increase, no change, decrease) were also asked.

The present study was approved by the Ethics Committee of Shiraz University of Medical Sciences (IR.SUMS.REC.1399.313).

Statistical analysis

Statistical Package for the Social Sciences Version 19.0 (SPSS Inc., Chicago, IL, USA) was used to analyze the data. Frequency (%) and mean \pm standard deviation was used as descriptive statistics. Chi-square test was also used to determine the relationship between demographic variables with alcohol toxicity and normal population. Independent sample t-test was conducted to compare the mean scores of temperament and character in alcohol toxicity and normal population groups. Moreover, covariance analysis was performed to adjust gender, age, level of education, marital status, and economic status to further compare the mean scores of temperament and character in alcohol toxicity and normal population groups. $P < 0.05$ was considered as the level of significance.

Results

In this study, the participants were 390 persons (135 persons in alcohol toxicity group and 255 persons in normal population group). Among the participants, there were 216 males (55.4%) and 174 females (44.6%). The mean age of the participants was 32.88 ± 13.49 years (ranging from 18–65 years), and 197 persons (50.5%) aged < 30 years. Alcohol toxicity was mostly observed among the young males (male/female ratio was 6.45). Moreover, 82 persons (61.2%) hold diploma or had elementary education, and 80 cases (59.3%) reported low economic status (Table 1).

Among those who were admitted because of alcohol toxicity, 39 cases (28.9%) reported that they had received information about the beneficial effect of alcohol consumption in preventing and treating COVID-19 infection. Among the normal population, 123 participants (49%) also have the same self-reports. Among the inpatients, 24 cases (17.9%) believed that alcohol was effective in treating and

preventing COVID-19 disease. Similarly, seven cases (2.8%) of the normal population held the same belief.

Regarding the reasons for alcohol consumption among those who were admitted because of alcohol toxicity, 20 cases (15%) reported that they used alcohol to prevent COVID-19, 64 cases (48.1%) reported alcohol consumption as a habit, and 49 cases (36.8%) reported recreational consumption of alcohol.

The amount of alcohol consumption in the cases who were admitted due to alcohol toxicity varied. In this regard, 82 (60.7%) cases reported that they used to drink alcoholic beverages more than once a week, 31 (23.0%) cases reported they drink at most three times of drinking per month, and 22 cases (16.3%) reported at most six times of drinking per year. However, 35 cases (26.5%) has increased their consumption during COVID pandemic, 90 cases (68.1%) reported no significant change in their consumption, and 7 cases (5.3%) reported decreased consumption.

According to independent sample t-tests, the mean scores of novelty seeking, harm avoidant, and self-transcendent were higher in the alcohol toxicity group than normal population ($P < 0.01$). In contrast, the mean scores of reward dependent, cooperativeness, and self-directedness were higher in normal population than the alcohol toxicity group ($P < 0.001$). The mean score of persistence was not significant in both group ($P = 0.718$).

To adjust gender, age, level of education, marital status, and economic status based on covariance analysis, the mean scores of novelty seeking and self-transcendent were higher in the alcohol toxicity group than normal population ($P < 0.001$). The mean scores of reward dependent, cooperativeness, and self-directedness were also higher in normal population than the alcohol toxicity group ($P < 0.001$). The mean scores of persistent and harm avoidant were not significant in both group ($P > 0.05$).

Discussion

Following the spread of COVID-19 disease in Iran, one of the misinfodemics about the new COVID-19 pandemic was that alcohol consumption was beneficial in preventing and treating the disease. This rumor was immediately followed by a large number of patients referring to the emergency wards, who were intoxicated by alcohol consumption as a failed attempt to prevent infection. The findings of the interviews in this study showed that almost half of the normal population and one third of alcohol abusers had heard this rumor. In addition, 15% of the alcohol abusers declared that they consumed alcohol to prevent the disease. On the other hand, a majority of abusers declared that they consume alcohol excessively and habitually (more than once per week).

The main findings of the present study was that the alcohol abusers were mainly males, aged below 30 years, and had lower levels of education and lower economic status. This findings is compatible with previous studies [12, 27]. Some fundamental works in this field also noted that drinking for coping motives is more prevalent among younger male especially after adolescence [19]. This lends support to the assumption that alcohol toxicity population of our study responded to the stressful situation by

consuming alcohol. Among temperament dimensions, novelty-seeking and self-transcendence scores were higher and reward-dependency score was lower among the alcohol abusers. However, among character dimensions, cooperativeness and self-directedness scores were lower among the alcohol abusers. These findings are consistent with most of the similar studies [28–32].

Preliminary works in this field reported TCI character dimensions to be moderately and homogeneously related to nearly all the personality disorders [33–35]. Lower self-directedness and lower cooperativeness indicate the higher likelihood of personality disorder, according to Cloninger's hypothesis and many other studies [33, 35]. Lower self-directedness is associated with difficulty accepting responsibility, setting meaningful goals, resourcefully meeting challenges, accepting limitations and disciplining habits to maintain the harmony with their goals and values. Besides, individuals with lower cooperativeness are excessively self-centered, socially intolerant and unhelpful to others lacking empathy, compassion or principles [35]. These are assumed as the core features of personality disorders [35]. In addition, several studies claimed that cluster A personality disorder symptoms (in particular, schizoid personality disorder symptoms) are correlated with low reward-dependence scores. Furthermore, Higher novelty-seeking was correlated with higher impulsiveness, exploratory excitability, extravagance, and disorderliness, which are included in Cluster B personality disorders and associated with alcohol and drug involvement [33, 36].

Body of literature has investigated in order to find correlation between TCI and alcohol abuse. Our experiments are in line with previous results. As expected, higher scores of novelty-seeking, lower scores of self-directedness and lower scores of cooperativeness were the most relevant traits in alcohol and other substance abuse [28–31, 37, 38]. Moreover, based on references, lower reward-dependence score is a highly reported score among alcohol abusers [39–41]. Another study by Le Bon et al. [31] revealed that, in addition to higher scores of novelty seeking and self-directedness, self-transcendence score was also higher in alcohol and drug abusers, in comparison to normal population. However, a review of the literature on harm avoidance documented inconsistent findings among alcohol abuser's populations [30, 42, 43]. However, the results were not statistically significant in the present study.

Conclusion

Taken together, the results of this study suggest that there are specific temperamental and character personality dimensions that are typical of probable alcohol abusers. Consequently, the identification of a personality profile at risk for alcohol abuse may have a preventative value. Among temperament dimensions, higher novelty-seeking and self-transcendence scores and lower reward-dependency score were indicative of alcohol abuse. Besides, among character dimensions, lower cooperativeness and self-directedness scores were more prevalent among the alcohol abusers. These dimensions of temperament and character have correlation with several personality disorders such as Cluster B personality disorder symptoms (impulsiveness, exploratory excitability, extravagance, and disorderliness) and Cluster A personality disorder symptoms (in particular, schizoid personality disorder symptoms).

Limitations Of The Study

We aware that our research may have two limitations. The first is that since we interviewed the alcohol toxicity cases, who were admitted in emergency ward, a majority of the interviewees were not in a proper mental status to be included in this study. Second, the published data on alcohol abuse and its epidemiology are highly limited in Iran; thus, the comparative analysis of the findings was not utterly feasible.

Abbreviations

TCI: temperament and character inventory

OR: odds ratio

Novelty seeking (NS)

Harm avoidant (HA)

Reward dependence (RD)

Persistence (PS)

Cooperativeness (CO)

Self-directedness (SD)

Self-transcendence (ST)

Declarations

Ethics approval and consent to participate

This study was approved by the Ethics Committee of Shiraz University of Medical Sciences (IR.SUMS.REC.1399.313). All participants gave verbal consent before participation in the study.

Consent to publish

Not applicable.

Availability of data and materials

The datasets used and/or analyzed during the current study available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

AM and ST contributed in designed the study, analyzed the data, and interpreted the results, wrote the manuscript drafting. **ARE, HMV, MK, and LZ** contributed in analysis of data and interpretation the results and wrote the manuscript drafting. **KBL** contributed in interpretation the results and designed the study. The final version was confirmed by all authors for submission

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Tables

Table 1. The relationship between demographic features with alcohol toxicity and normal population

		Normal population	Alcohol Toxicity	P-value
Age	<30	139 (56.3)	58 (43.0)	<0.001
	30-49	62 (25.1)	65 (48.1)	
	≥50	46 (18.6)	12 (9.1)	
Gender	Male	99 (38.8)	116 (86.7)	<0.001
	Female	155 (61.2)	18 (13.3)	
Marital Status	Single	151 (59.7)	81 (60.0)	0.952
	Married	102 (40.3)	54 (40.0)	
	Divorced or Widowed	253 (65.2)	135 (34.8)	
Level of education	Elementary	35 (13.9)	30 (22.4)	<0.001
	Diploma	32 (12.7)	52 (38.8)	
	Bachelor's	83 (32.9)	50 (37.3)	
	MA or PhD	102 (40.5)	2 (1.5)	
Economic status	Lower income	83 (33.5)	80 (59.3)	<0.001
	Middle income	108 (43.5)	52 (38.5)	
	High income	57 (23.0)	3 (2.2)	

Table 2. Relationship of temperament and character items between alcohol toxicity and normal population

		Number	Mean	Std. Deviation	P value**	P value***
Novelty seeking	Normal population	255	8.21	3.34	<0.001	<0.001
	Alcohol toxicity	135	10.27	2.06		
Harm Avoidant	Normal population	255	7.86	4.60	0.002	0.203
	Alcohol toxicity	135	8.93	2.31		
Reward Dependent	Normal population	255	8.38	2.43	<0.001	<0.001
	Alcohol toxicity	135	6.65	1.77		
Persistence	Normal population	255	3.18	1.42	0.718	0.448
	Alcohol toxicity	135	3.22	1.05		
Cooperativeness	Normal population	255	17.68	3.84	<0.001	<0.001
	Alcohol toxicity	135	11.59	2.76		
Self-directedness	Normal population	255	14.64	5.19	<0.001	<0.001
	Alcohol toxicity	135	8.21	3.43		
Self-transcendent	Normal population	255	9.16	3.17	<0.001	<0.001
	Alcohol toxicity	135	10.75	2.78		

** Based on independent t-test

*** Analysis of covariance adjusted by gender, age, level of education, marital status, economic status