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# Relationship between anger and drug addiction potential as factors affecting the health of medical students

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## Abstract:

**BACKGROUND:** One of the psychobehavioral factors that can predict drug abuse in students is anger. This study aimed to evaluate the association between anger and drug addiction potential in medical students in Iran in relation to their gender and college.

**MATERIALS AND METHODS:** This descriptive and analytical cross-sectional study was conducted on 373 students of five colleges at Lorestan University of Medical Sciences in Iran. For collecting data, Persian versions of state-trait anger expression inventory-2 and addiction potential scale were employed. Data were analyzed in SPSS software using *t*-test, one-way ANOVA, and Pearson correlation test.

**RESULTS:** There was a significant positive relationship between subjective components of anger (state anger, trait anger, anger expression-out, and anger expression-in) and addiction potential in samples ( $P < 0.05$ ), while anger regulation components (anger control-in and anger control-out) had significant negative correlation with addiction potential ( $P < 0.05$ ). Moreover, a significant difference was found in mean addiction potential scores between samples based on gender and college. With respect to mean anger scores, the difference between students based on gender was significant only in terms of state anger and anger expression-in, while we found no significant difference between them based on college except in anger expression-out ( $P < 0.05$ ).

**CONCLUSION:** Subjective components of anger can predict drug addiction potential in medical students. It is recommended that anger management programs should be provided to the medical students as one of the most important community groups in the field of public health.

## Keywords:

Anger, college, drug addiction, gender, medical education

## Introduction

Substance or drug abuse is one of the four major global crises and considered as a biological, psychological, and social disorder.<sup>[1,2]</sup> According to American Psychiatric Association,<sup>[3]</sup> drug abuse disorders are “patterns of symptoms resulting from the use of a substance that you continue to take, despite experiencing problems as a result.” It is found across all occupations, educational levels, and social classes and is not related to specific individuals or groups.<sup>[4]</sup>

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Sociocultural, biological, interpersonal, and psychobehavioral factors are among the predictor variables of drug abuse. Among these factors, psychobehavioral factors consist of a wide range of variables such as anger. Anger is an emotional state that can be triggered in many ways and may affect various aspects of physical and mental health.<sup>[5]</sup> It “consists of feelings that vary in intensity from mild irritation or annoyance to intense fury and rage, accompanied by activation and of neuroendocrine processes and arousal of the autonomic nervous system.”<sup>[6]</sup> According to Spielberger, anger has two main components: state anger and

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trait anger. State anger refers to the intensity of anger at a specified time, while trait anger is conceptualized "in terms of individual differences in the disposition to perceive a wide range of situations as annoying or frustrating and by the tendency to respond to such situations with elevations in state anger."<sup>[6-8]</sup> Many addicts have problems dealing with anger expression. A person who is unable to express their anger in a healthy way will resort to using more drugs or alcohol as a method of coping with these strong feelings, leaving them in an endless destructive cycle. According to some studies, severe anger is generally associated with lower quality of life and high-risk behaviors such as drug addiction and alcohol abuse.<sup>[9,10]</sup> Research findings also have indicated that anger contributes to depression, hypertension, and coronary heart disease, and psychological well-being.<sup>[5]</sup> Excessive anger puts children and adolescents at-risk for social rejection by peers, which may cause poor school adjustment, school dropout, social problem-solving skills deficits, and higher rates of mental health referrals.<sup>[11]</sup> Anger is communicated by adolescents through aggression and acting out behaviors that may lead to acceptance by deviant peer groups.<sup>[11]</sup> Serafini *et al.* showed that high anger was associated with a greater likelihood of experiencing delirium tremens, relapsing on drugs due to alcohol use, having difficulty controlling temper and behavior, and being arrested for attacks on persons.<sup>[12]</sup> Eftekhari *et al.* suggested that expression of anger and avoidant coping are independent risk factors for substance use in incarcerated adolescents.<sup>[13]</sup>

In Iran, due to the geographical situation and sharing a common border with the two countries of Afghanistan and Pakistan, the issue of drug abuse has a particular importance. College students in Iran are at higher risk of drug abuse. They experience fundamental changes and particular stresses in their lives for being far from family, financial dependence, making new relationships especially with the opposite sex, employment, worrying about future, political beliefs, etc. They use drugs as a coping strategy to reduce their stress. Epidemiological studies in Iran have verified this claim.<sup>[14,15]</sup> Most of studies conducted in Iran on college students are related to examining association of aggression with addiction tendency, and less attention has been paid to the effect of anger on the incidence of drug addiction in medical students. To the best of our knowledge, there is only one similar study conducted by Agha Yusefi *et al.*<sup>[16]</sup> where the association of subjective components of anger (state anger, trait anger, anger expression-out, and anger expression-in) with addiction potential in medical students in Kermanshah was reported. Any long-term damage in medical students such as addiction, in addition to themselves, can endanger the health of general population. Hence, it is obvious that identifying the risk factors for addiction in this group is necessary.

Moreover, having knowledge of the relationship between anger and addiction potential can be an important step toward the prevention of social disease. Due to the importance of this knowledge and given that less studies conducted in this area in Iran, this study aimed to evaluate the relationship between anger (state anger, trait anger, anger expression-out, anger expression-in, anger control-out, and anger control-in) and addiction potential in medical students based on their gender and college.

## Materials and Methods

This is a descriptive and analytical cross-sectional study. Study population consists of all students of Lorestan University of Medical Sciences (LUMS) located in Iran. Of this, 373 were selected from five schools (medicine, dentistry, pharmacy, nursing and midwifery, health and paramedical sciences) using stratified and quota sampling techniques and then randomly based on their school and academic major as well as inclusion criteria (having ages 18–35 years and no history of academic probation). Meanwhile, exclusion criteria were having any mental illness, being under treatment for psychiatric diseases, and having no willingness to participate in the study. For estimating sample size, Krejcie and Morgan Table was used by considering significant alpha ( $\alpha$ ) = 1%, error ( $\beta$ ) = 10 and effect size ( $r$ ) = 2%.

For collecting data, Persian versions of Spielberger's state-trait anger expression inventory-2 (STAXI-2) and addiction potential scale (APS) were employed. STAXI-2 designed by Spielberger<sup>[6]</sup> has 57 items scored based on 4-point Likert type scale. Items 1–15 measure state anger scale (feeling angry, feel like expressing anger verbally, feel like expressing anger physically) ranges from 1 = Not at all to 4 = almost always; item 16–25 are related to trait anger scale (angry temperament, angry reaction) ranges from 1 = almost never to 4 = almost always; and items 26–57 assess anger expression scale (anger expression-out, anger expression-in, anger control-out, and anger control-in) ranges from 1 = almost never to 4 = almost always. Khodayarifard *et al.*<sup>[17]</sup> reported a Cronbach's alpha coefficient of 0.6–0.93 for the validity of its Persian version, and a test-retest reliability of 0.53–0.93. The APS is a measure of the personality factors underlying the development of addictive disorders. Its Persian version was designed by Zargar *et al.*<sup>[18]</sup> according to psychosocial aspects of Iranian society. It has 41 items (5 of which are lie detectors) assessing two scales. First scale is related to antisocial behaviors, tendency to use drugs, positive attitude toward drugs, depression, and sensation-seeking, while most items in the second scale is about nonassertiveness and depression. The scoring is based on 3-point Likert type scale ranges from 1 = Totally disagree to 3 = Totally agree. Acceptable

construct validity ( $r = 0.45$ ) and reliability ( $\alpha = 0.90$ ) has already been reported for its Persian version.<sup>[18]</sup> This questionnaire was used a self-report.

Before collecting data, written and verbal consents were obtained from participants, and they were assured of the confidentiality of their information. After collecting data, they were analyzed in SPSS v. 20 software and presented using descriptive statistics (mean, standard deviation, percentage) and performing statistical tests ( $t$ -test for comparing mean scores based on gender, one-way ANOVA for comparing mean scores based on college, and Pearson correlation test for examining relationship between anger and addiction potential). The significance level set at 0.05 ( $P < 0.05$ ).

## Results

### Characteristics of students

Of 373 students participated in this study, 125 were males and 248 females aged 17–33 years (mean age =  $21.44 \pm 2.54$  years). One hundred and forty-three were from School of Medicine; 34 from Dentistry; 17 from Pharmacy; 68 from Nursing and Midwifery; and 111 from Health and Paramedical Sciences schools. Majority of them had no history of mental illness (98.9%) and academic probation (97.9%). Results obtained from STAXI-2 reported that the mean of state anger in participants was  $7.54 \pm 6.26$ , while their mean trait anger was  $8.41 \pm 3.98$ . Regarding the score of anger dimensions, mean of anger expression-out was reported  $8.65 \pm 3.72$ ; anger expression-in,  $9.97 \pm 3.63$ ; anger control-in,  $12.94 \pm 4.46$ ; and anger control-out,  $13.37 \pm 4.38$ . Their mean total anger expression was

$40.13 \pm 9.8$ . Furthermore, the APS data reported a mean addiction potential of  $94.89 \pm 19.86$ .

### Anger based on gender and college

The mean anger of male students was higher in all dimensions of state anger ( $7.84 \pm 5.13$ ), trait anger ( $8.17 \pm 4.40$ ), anger expression-in ( $10.57 \pm 4.04$ ), expression-out ( $9.06 \pm 3.73$ ), anger control-in ( $13.54 \pm 4.58$ ), and anger control-out ( $13.09 \pm 4.58$ ); however,  $t$ -test results showed that the difference between male and female students was significant only in terms of state anger ( $P = 0.003$ ) and anger expression-in ( $P = 0.026$ ). Regarding anger regulation styles of control-in and control-out, no significant difference was found between students, either ( $P > 0.05$ ) [Table 1].

Students in school of dentistry had higher mean of state anger ( $7.94 \pm 5.45$ ), anger control-in ( $14.17 \pm 4.60$ ), and anger control-out ( $16.14 \pm 4.23$ ); those in school of pharmacy had higher mean of trait anger ( $9.64 \pm 5.29$ ) and anger expression-in ( $11.70 \pm 4.80$ ); and in anger expression-out, students of nursing and midwifery school reported higher mean ( $13.09 \pm 4.82$ ). By comparison of the mean anger of students based on their college, it was found out that there was no significant difference between students in different colleges in terms of all anger components ( $P > 0.05$ ) except in anger expression-out ( $F = 3.46$ , Sig. =  $0.009 < 0.05$ ) [Table 2].

### Addiction potential based on gender and college

By comparing the mean addiction potential of students based on their gender, results showed a significant difference between male and female students ( $t = 5.14$ , Sig. =  $0.001 < 0.05$ ), where female students showed higher

**Table 1: Independent  $t$ -test results for comparing the mean of anger components based on gender**

Gender	Mean $\pm$ SD					
	State anger	Trait anger	Anger expression-out	Anger expression-in	Anger control-in	Anger control-out
Female	7.04 $\pm$ 5.64	8.37 $\pm$ 3.94	8.42 $\pm$ 3.70	9.66 $\pm$ 3.41	12.88 $\pm$ 4.28	13.28 $\pm$ 4.31
Male	8.60 $\pm$ 7.25	8.46 $\pm$ 4.08	9.08 $\pm$ 3.72	10.58 $\pm$ 4.01	13.09 $\pm$ 4.82	13.54 $\pm$ 4.55
Test results	$t=-2.969$ , df=366, sig.=0.003	$t=0.228$ , df=367, sig.=0.820	$t=-1.573$ , df=367, sig.=0.117	$t=-2.234$ , df=367, sig.=0.026	$t=-0.403$ , df=364, sig.=0.687	$t=-0.475$ , df=366, sig.=0.635

SD=Standard deviation

**Table 2: One-way ANOVA results for comparing the mean of anger components based on college**

Medical colleges	Mean $\pm$ SD					
	State anger	Trait anger	Anger expression-out	Anger expression-in	Anger control-in	Anger control-out
Medicine	7.61 $\pm$ 6.32	7.63 $\pm$ 3.56	12.88 $\pm$ 4.28	9.83 $\pm$ 4.03	12.88 $\pm$ 5.13	13.41 $\pm$ 4.99
Nursing and midwifery	7.29 $\pm$ 5.33	8.60 $\pm$ 3.50	13.09 $\pm$ 4.82	9.66 $\pm$ 3.50	12.63 $\pm$ 4.28	12.57 $\pm$ 4.01
Pharmacy	7.17 $\pm$ 6.53	9.64 $\pm$ 5.29	0.43 $\pm$ 0.82	11.70 $\pm$ 4.80	13 $\pm$ 3.08	13.29 $\pm$ 2.68
Health and paramedical sciences	7.55 $\pm$ 6.96	8.97 $\pm$ 4.17	9.64 $\pm$ 3.95	10.11 $\pm$ 3.15	12.87 $\pm$ 3.72	12.97 $\pm$ 3.69
Dentistry	7.94 $\pm$ 5.45	8.85 $\pm$ 4.80	8.26 $\pm$ 3.21	9.91 $\pm$ 2.84	14.17 $\pm$ 4.60	16.14 $\pm$ 4.23
Test results	$F=0.682$ , df=4, sig.=0.605	$F=3.129$ , df=4, sig.=0.115	$F=3.460$ , df=4, sig.=0.009	$F=1.169$ , df=4, sig.=0.324	$F=0.712$ , df=4, sig.=0.584	$F=1.927$ , df=4, sig.=0.10

SD=Standard deviation

potential for addiction ( $98.46 \pm 18.16$ ) compared to male students ( $87.58 \pm 21.19$ ) [Table 3].

Comparison results of addiction potential based on college of students also reported that there was a significant difference between students ( $F = 2.821$ ,  $\text{Sig.} = 0.025 < 0.05$ ), where students in schools of health and paramedical sciences had higher potential for addiction ( $99.80 \pm 14.23$ ) compared to students of other colleges [Table 4].

### Anger and addiction potential

Pearson correlation test results showed that subjective components of state anger ( $r = 0.397$ ), trait anger ( $r = 0.470$ ), anger expression-out ( $r = 0.298$ ), and anger expression-in ( $r = 0.311$ ) had a significant positive correlation with addiction potential ( $P < 0.05$ ), while components of anger control-in ( $r = -0.325$ ) and anger control-out ( $r = -0.308$ ) had significant negative correlation with addiction potential ( $P < 0.05$ ). In total, it can be claimed that anger has a significant association with addiction potential among medical students ( $r = 0.428$ ,  $P < 0.05$ ) [Table 5].

## Discussion

Students encounter many kinds of stressors in university. The abundance of experienced stressors and low stress tolerance lead to high rate of violent behaviors and difficulty in anger management.<sup>[19]</sup> Considering the continued problems related to anger and drug abuse in universities this study attempted to evaluate the relationship between anger and addiction potential among college students. Samples were medical students of LUMS. Temel *et al.*<sup>[19]</sup> on evaluating university students of Tekirdag Namik Kemal University in Turkey using trait anger-anger expression scale, and Agha Yusefi *et al.*<sup>[16]</sup> on medical students of Kermanshah University of Medical Sciences using STAXI-2 scale, reported higher mean anger expression and anger control scores

compared to the current study. Moreover, in the study of Agha Yusefi *et al.*, students reported lower addiction potential scores compared to our study. Hence, it can be said that our results are not in agreement with their studies in terms of mean anger expression, anger control, and addiction potential. This inconsistency may be attributed to the difference in the research area and samples.

Another finding of this study was the positive correlation between subjective components of anger (state anger, trait anger, anger expression-out, and anger expression-in) and addiction potential. This is consistent with findings of Sharma *et al.*<sup>[10]</sup> and Agha Yusefi *et al.*<sup>[16]</sup> Ilyuk *et al.*<sup>[20]</sup> in their study also showed that in all groups of drug and alcohol-dependent participants, anger was significantly higher. Quinn *et al.*<sup>[21]</sup> also stated that adolescents with high trait anger exhibit higher substance abuse. In our study, anger regulation styles (control-in and control-out) of students had significant negative association with their addiction potential, which is consistent with the findings of Lapa *et al.*<sup>[8]</sup> The suppression or inhibition of anger has detrimental effects on physical and mental health, and it can contaminate appraisals of a subsequent painful stimulus in a measureable and potentially clinically meaningful way.<sup>[22]</sup> Hence, it increases addiction potential.

In the current study, male students reported higher scores of anger expression and anger regulation styles compared to female students. Most of studies in the literature propose that anger differences exist between the sexes, where women showing less anger than men. Due to consistently focusing on the needs of others, women have difficulty expressing anger. In addition, females are taught to hide or suppress their anger and learn to become terrified of becoming angry. "Anger is often described as the primary male emotion, with every other negative or painful emotion (i.e., jealousy, sadness, etc.) being transferred into anger over and

**Table 3: Independent t-test results for comparing the mean score of addiction potential based on gender**

Gender	n	Addiction potential (mean±SD)	95% CI		t	df	Sig.
			Lower bound	Upper bound			
Female	248	98.46±18.16	6.721	15.03	5.146	370	0.001
Male	125	87.58±21.19					

SD=Standard deviation, CI=Confidence interval

**Table 4: One-way ANOVA results for comparing the mean score of addiction potential based on college**

Medical colleges	n	Mean±SD	95% CI		F	df	Sig.
			Lower bound	Upper bound			
Medicine	143	92.03±24.45	87.99	96.07	2.821	4	0.025
Nursing and midwifery	65	94.95±15.37	91.23	98.67			
Pharmacy	17	94.47±24.29	81.97	106.96			
Health and paramedical sciences	111	99.80±14.23	97.12	102.47			
Dentistry	34	90.97±17.39	84.90	97.03			

SD=Standard deviation, CI=Confidence interval

**Table 5: Correlation test results for comparing anger and addiction potential of students**

Anger components	Addiction potential	
	r	Sig.
State anger	0.397	0.001
Trait anger	0.470	0.001
Anger expression-out	0.298	0.001
Anger expression-in	0.311	0.001
Anger control-in	-0.325	0.04
Anger control-out	-0.308	0.001
Total	0.428	0.001

over again,"<sup>[11]</sup> In the study of Burney,<sup>[23]</sup> male students demonstrated higher levels of reactive and instrumental anger, while females show higher levels of anger control. Similarly, Özmen *et al.*<sup>[24]</sup> found out that male students had a higher level of trait anger and expressed their anger more often, while female students controlled their anger more. In our study, however, difference between male and female students was significant only in terms of state anger ( $P = 0.003$ ) and anger expression-in ( $P = 0.026$ ), and the changes in their anger regulation scores were not significant either.

Our study also reported a significant association between gender and addiction potential, where female students were more likely to become addicts ( $98.46 \pm 18.16$ ) compared to male students ( $87.58 \pm 21.19$ ). This is in agreement with the findings of Zargar *et al.*<sup>[18]</sup> It may be argued that since girls in Iran have more limitations than boys to express their anger for sociocultural reasons; they inevitably suppress their anger. This causes them to have more addictive behaviors to escape the unpleasant feelings they experience through suppressing their anger. However, results of Baron-Oladi *et al.*<sup>[25]</sup> and Ranjbaran *et al.*<sup>[26]</sup> are against this claim. Baron-Oladi *et al.* reported that male preuniversity students in Kerman were more prone to addiction than female students, and in the study of Ranjbaran *et al.*, male students of Arak University of Medical Sciences reported higher potential for addiction. This inconsistency can be related to the difference in study location. Hence, we can say that addiction tendency of male and female medical students in Iran are different considering the university or college they are studying at.

## Conclusion

Subjective components of anger (state anger, trait anger, anger expression-out, and anger expression-in) had significant roles in predicting addiction potential of students in LUMS. It is important to direct students to sports and social activities that will minimize their anger and keep them away from addictive factors such as cigarettes or drugs. There were some limitations in conducting this study such as students' lack of cooperation

due to unwillingness, high number of questions, and lack of time. They completed questionnaires as self-reporting which can affect the outcomes of the study. In this study, only medical students of LUMS were evaluated; hence, more studies on anger and addiction potential should be conducted in other universities and of Iran. It is recommended that anger management programs should be provided to the medical students as one of the most important communities in the field of public health. Medicosocial centers of universities should increase awareness of the students about counseling center and its services and provide counseling on students' emotional, academic, and social problems.

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## Ethical considerations

This study has been approved by the Research Ethics Committee of LUMS (code: LUMS. REC.1396.255). Before collecting data, written and verbal consents were obtained from participants and they were assured of the confidentiality of their information. They were free to withdraw the study at any time.

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## Conflicts of interest

There are no conflicts of interest.

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