

**Araştırma / Original article****Severity of craving is related with severity of adult ADHD symptoms among inpatients with alcohol use disorder****Müge BOZKURT,<sup>1</sup> Cüneyt EVREN,<sup>1</sup> Gökhan UMUT,<sup>1</sup>  
Ruken AĞAÇHANLI,<sup>1</sup> Bilge EVREN<sup>2</sup>****ABSTRACT**

**Objective:** The aim of the present study was to evaluate relationship of craving severity with severity of adult attention-deficit/hyperactivity disorder (ADHD) symptoms in a sample of inpatients with alcohol use disorder, while controlling the effects of anxiety and depressive symptoms. **Methods:** Participants included 78 inpatients with alcohol use disorder. Participants were evaluated with the Obsessive-Compulsive Drinking Scale (OCDS), the Adult ADHD Self-Report Scale (ASRS-v1.1), the State-Trait Anxiety Inventory (STAI) and the Beck Depression Inventory (BDI) after a detoxification period of three to four weeks. **Results:** Although trait anxiety predicted OCDS score, trait anxiety was no longer a predictor after entering ASRS-18 score and the ASRS-18 score was the only predictor for severity of craving in linear regression analyses. Results for the ASRS-6 were the same. Among subscales of ASRS-18 inattentive score predicted OCDS score. When obsessive and compulsive dimensions of craving were taken as dependent variables, ASRS-18/ASRS-6 predicted obsessive craving score together with the trait anxiety, whereas ASRS-18/ASRS-6 predicted compulsive craving alone. **Conclusion:** These findings suggest that severity of ADHD symptoms (particularly inattentive symptoms) is related with severity of the craving. Although ADHD symptoms predicted compulsive craving alone, it predicted obsessive craving together with the trait anxiety. Also ASRS-18 and ASRS-6 showed similar results, suggesting that ASRS-6 with much less items can be used among this population for screening ADHD symptoms. (*Anatolian Journal of Psychiatry* 2017; 128(1):13-21)

**Keywords:** ADHD, alcohol use disorders, craving, Obsessive-Compulsive Drinking Scale

**Alkol kullanım bozukluğu olan ve yatarak tedavi gören hastalarda aşermenin şiddeti erişkin DEHB belirtilerinin şiddeti ile ilişkilidir****ÖZ**

**Amaç:** Bu çalışmanın amacı alkol kullanım bozukluğu olan ve yatarak tedavi gören hastalarda aşerme şiddetinin erişkin dikkat eksikliği hiperaktivite bozukluğu (DEHB) belirti şiddeti ile ilişkisini anksiyete ve depresyonun etkisini de kontrol ederek incelemektir. **Yöntem:** Çalışmaya alkol kullanım bozukluğu nedeniyle yatarak tedavi gören 78 hasta alındı. Katılımcılar arındırma döneminin ardından, son alkol alımlarının üzerinden 3-4 hafta geçtikten sonra, Obsesif-Kompulsif İçme Ölçeği (OKİÖ), Erişkin Dikkat Eksikliği Hiperaktivite Bozukluğu Kendi Bildirim Ölçeği (ASRS-v1.1), Durumluk ve Sürekli Kaygı Envanteri (STAI) ve Beck Depresyon Ölçeği (BDÖ) ile değerlendirilmiştir. **Sonuçlar:** Sürekli kaygı, OKİÖ puanlarını belirlemiş olsa da lineer regresyon analizinde ASRS-18 puanı hesaplamaya katıldığında aşermenin şiddetini sadece ASRS-18 puanı belirlemiştir. ASRS-6 için de sonuçlar aynı

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*bulunmuştur. ASRS-18'in alt ölçeklerinde aşermeyi dikkat eksikliği puanları belirlemiştir. Aşermenin obsesif ve kompulsif boyutları bağımlı değişken olarak ele alındığında ise ASRS-18/ASRS-6 sürekli kaygı ile birlikte obsesif aşermeyi belirlerken, kompulsif aşermeyi sadece ASRS-18/ASRS-6 belirlemiştir. **Sonuç:** Bu sonuçlar DEHB belirti şiddetinin (özellikle dikkat eksikliği belirtilerinin) aşerme şiddeti ile ilişkili olduğunu göstermektedir. DEHB belirtileri kompulsif aşerme şiddetini tek başına belirlemiş olsa da, obsesif aşerme şiddetini sürekli kaygı ile birlikte belirlemiştir. ASRS-18 ve ASRS-6 ile benzer sonuçlar elde edilmiş olması, daha az madde içeren ASRS-6'nın bu popülasyonda DEHB belirtilerini taramak için kullanılabileceğini düşündürmektedir. (Anadolu Psikiyatri Derg 2017; 18(1):13-21)*

**Anahtar sözcükler:** DEHB, alkol kullanım bozukluğu, aşerme, Obsesif-Kompulsif İçme Ölçeği

### INTRODUCTION

Craving is described as 'a strong desire or sense of compulsion to take the substance'.<sup>1</sup> It is accepted as a significant feature of dependence and included as a new criterion of alcohol use disorder (AUD) in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5).<sup>2</sup> Craving for alcohol is one of the features noted before relapse in some abstinent patients, which may contribute to the risk of relapse.<sup>3</sup> Higher levels of craving assessed in role play and cue reactivity are known as a risk factor for a worse outcome in alcoholism.<sup>4-6</sup> O'Connor et al.<sup>7</sup> have reported a higher dropout rate during alcohol withdrawal among outpatients with an increased craving. Among patients in outpatient treatment program, craving predicted both relapse during the treatment phase and heavy relapse 12-month after completion of the treatment.<sup>3,8</sup> Alcohol craving was also found to be related with severity of general psychopathology,<sup>9</sup> negative emotions,<sup>6</sup> stress and anxiety.<sup>10,11</sup>

Attention-deficit/hyperactivity disorder (ADHD) is a childhood-onset disorder that persist into adolescence and adulthood in more than half of the cases.<sup>12</sup> According to screening test results prevalence of possible ADHD in AUD is between 21% and 23.1%.<sup>13,14</sup> ADHD and AUD are not only highly comorbid, they may also share some genetic characteristics that lead to vulnerability.<sup>15</sup> In individuals with ADHD comorbidity, neurobiological differences, impaired executive functioning and impulsivity may contribute to increased AUD complexity and chronicity.<sup>16,17</sup> ADHD was positively associated with early initiation of alcohol use, the risky use of alcohol, and the presence of AUD.<sup>18</sup> ADHD and related comorbidities were shown to accelerate the transition from less severe alcohol use to more severe dependence.<sup>19</sup> Research also suggests that co-occurring ADHD and AUD are associated with a more severe course of alcohol use, poorer treatment outcome,<sup>20</sup> longer duration of alcohol use and a slower remission rate for

AUD.<sup>21</sup> Not only an accurate diagnosis of ADHD is associated with negative consequences in AUD, but also the symptoms screened with ASRS predicted the complexity and chronicity of alcohol use.<sup>22</sup>

Clinical practice suggests that patients with AUD and ADHD may also suffer more from alcohol craving than AUD-only patients because the improvements of ADHD symptoms significantly correlated with the reduction of alcohol craving.<sup>23</sup> Nevertheless, the acute effects of substance intoxication or withdrawal may resemble some symptoms of ADHD (e.g. impulsivity, attention difficulties, restlessness)<sup>20</sup> suggest at least four weeks of abstinence before evaluating patients for ADHD so that ADHD symptom assessments are accurate and reliable. In a study conducted by Seitz et al.,<sup>24</sup> patients with probable adult ADHD showed higher craving, more withdrawal and psychiatric symptoms, than patients without ADHD symptoms. Authors reported that alcohol craving is likely related to withdrawal and psychiatric symptoms more strongly than to ADHD symptoms. They suggested that one of the explanation may be that newly sober patients might perceive ADHD symptoms (eg., agitation) as effects of detoxification and overestimate their withdrawal symptoms at the expense of ADHD symptoms. These results suggest that further research is needed to identify the exact relationship between craving and ADHD in patients with AUD.

The aim of this study was to evaluate relationship of craving severity with severity of adult ADHD symptoms in AUD while controlling the effects of anxiety and depressive symptoms. Previous data came from the study that is conducted among patients with cannabis use disorder suggested that the two symptom dimensions of ADHD, namely inattentive (IN) and hyperactive/impulsive (HI), are not equivalent with regard to risk for cannabis outcomes and may show differential associations across stages of cannabis use.<sup>25</sup> Thus, it is important

to evaluate predictive value of these dimensions on craving. In previous studies conducted in alcohol dependent populations by our group, craving was related with post traumatic stress disorder (PTSD), general psychopathology, particularly obsessive compulsive symptoms,<sup>9</sup> novelty seeking, negative affect such as depression and anxiety,<sup>26</sup> alexithymia and dissociation through negative affect.<sup>27</sup> Thus it is important to control the effect of depression and anxiety severity while evaluating the relationship between ADHD symptoms and craving, which is measured with Obsessive-Compulsive Drinking Scale (OCDS).

## METHODS

### Subjects

The study was conducted in Bakirkoy Training and Research Hospital for Psychiatry, Neurology and Neurosurgery, Alcohol and Drug Research, Treatment and Training Center in Istanbul between August 2014 and June 2015. It is a specialized center for substance use disorders with 84 inpatient beds (36 beds for AUD) and accepts patients from all over Turkey. The study was approved by the Ethical Committee of the institution. Patients' written informed consent was obtained after the study protocol was thoroughly explained. Seventy eight consecutively admitted male inpatients with AUD were considered for participation in the study. All participants meet the DSM-5 diagnostic criteria for AUD. Interviews with the study group were conducted after a detoxification period, that is, three to four weeks after the last day of alcohol use.

### Measures

**Obsessive-Compulsive Drinking Scale (OCDS):** Several clinical, neurobiological, and neuropsychological data suggest that both obsessive thoughts about alcohol use and compulsive behaviour towards drinking are part of craving. Modifying an interview-based questionnaire (Yale-Brown Obsessive Compulsive Drinking Scale: YBOCS-hd), Anton et al.,<sup>28</sup> developed a self-administered questionnaire consisting of 14 queries, the OCDS, which includes items to evaluate both total craving and its obsessive and compulsive components.<sup>28</sup> The ease of use (it can be completed in 5 minutes), the reproducibility, the validity, and the analytic capacity make the OCDS a very effective and useful questionnaire during trials for the treatment of patients with alcohol problems, while

also proving to be significantly related to the severity of alcoholism.<sup>29,30</sup> The scale was validated in Turkish alcohol dependent population.<sup>31</sup>

### **Adult ADHD Self-Report Scale (ASRS-v1.1):**

In conjunction with the World Health Organization (WHO)<sup>32</sup> developed a self-report scale for the screening of ADHD in adults (ASRS-v1.1; 10). The scale they propose is a short, 18-item scale (9 item for IN and 9 items for HI) which relates directly to the DSM IV TR diagnostic criteria. This 18 statements describing aspects of ADHD that are rated on a 5-point Likert scale from '0-never' to '4-very often'. The ASRS is a widely used and validated instrument, the 6-item screening version of which has been shown to outperform the full 18-item version in sensitivity (68.7% vs. 56.3%), specificity (99.5% vs. 98.3%) in American general population.<sup>33,34</sup> The scale was validated in Turkish in a sample of university students previousl<sup>35</sup>. Specifically, in a sample of patients with AUD, psychometric characteristics of Turkish version have been analyzed by Evren et al.,<sup>36</sup> in which satisfactory properties have been found. Nevertheless the result of the test does not replace clinical diagnosis and the clinician must take false positives into consideration by evaluating ASRS positives with gold standart scales.

### **Spielberger State-Trait Anxiety Inventory (STAI):**

As a measure of state and trait anxieties, the Spielberger State-Trait Anxiety Inventory (STAI), a 40-item self-report instrument was used.<sup>37</sup> The Turkish version of the STAI has been shown to have good reliability and validity.<sup>38</sup>

### **Beck Depression Inventory (BDI):**

Symptoms and severity of depression were evaluated by using the Beck Depression Inventory (BDI).<sup>39</sup> BDI is a 21-question self-report inventory. Turkish version of the scale was validated and its Cronabach alpha coefficient is reported to be 0.80.<sup>40</sup>

### Data analysis

The statistical package Statistical Packages for the Social Sciences (SPSS) 15.0 for Windows was used for all the analyses. Frequencies and percentages were given for sociodemographic variables. Pearson correlational analyses between the scale scores were conducted. Taking OCDS score and subscale scores of OCDS (Obsessive and Compulsive) as dependent variables, the Linear Regression models were performed. For all statistical analysis, p values

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**Table 1.** Sociodemographic variables

	Mean±SD	
Age	44.64±10.51	
Duration of education	9.37±3.76	
Onset of alcohol use	19.53±5.23	
Onset of regular alcohol use	25.49±8.13	
	Sayı	%
Marital status		
Married	45	57.7
Single	19	24.4
Divorced/widow	14	17.9
Employment		
No	20	25.6
Yes	29	37.2
Part-time	14	17.9
Retired	15	19.2

were two-tailed and differences were considered significant at  $p < 0.05$ .

## RESULTS

Sociodemographic variables of the sample is shown on Table 1. Scale scores were mildly and moderately correlated with each other (Table 2). Although trait anxiety predicted OCDS score, trait anxiety was no longer a predictor after entering ASRS-18 score and the ASRS-18 score was the only predictor for severity of craving in linear regression analyses. Same result was found for ASRS-6. Among subscales of ASRS-18 inattentive score predicted OCDS score (Table 3). When obsessive and compulsive dimensions of craving were taken as dependent variables, ASRS-18/ASRS-6 predicted obsessive craving

**Table 2.** Correlations between craving and severity of ADHD symptoms (n=78)

	Inattentive	Hyperactive/ impulsive	ASRS-18	ASRS-6	STAI-S	STAI-T	BDI
OCDS-obsessive	0.418	0.354*	0.426	0.396	0.357*	0.455	0.286**
OCDS-compulsive	0.469	0.336*	0.442	0.381*	0.332*	0.389	0.404
OCDS	0.486	0.376*	0.475	0.424	0.375*	0.459	0.381*
STAI-state	0.372*	0.431	0.447				
STAI-trait	0.492	0.449	0.520				
BDI	0.475	0.359	0.459				

\*  $p < 0.01$ ; \*\*  $p < 0.05$ ; rest of the  $p < 0.001$ ; ADHD: Attention-deficit/hyperactivity disorder; OCDS: Obsessive-Compulsive Drinking Scale; STAI: Spielberger State-Trait Anxiety Inventory; BDI: Beck Depression Inventory

score together with the trait anxiety, whereas ASRS-18/ASRS-6 predicted compulsive craving alone (Table 4).

## DISCUSSION

The main finding of the present study is that severity of ADHD symptoms is related with severity of the alcohol craving. Consistent with this, a study conducted by Seitz et al.<sup>24</sup> found that the patients with probable adult ADHD have higher alcohol craving than did patients without ADHD symptoms. Although authors of this previous study reported that alcohol craving was likely related to withdrawal and psychiatric symptoms more strongly than to ADHD symptoms, their explanation for this finding was that newly sober patients might erroneously perceive ADHD symptoms (eg, agitation) as effects of detoxification and overestimate their withdrawal symptoms at the expense of ADHD

symptoms. In contrast, since the effects of alcohol withdrawal may resemble some symptoms of ADHD, in the present study the interviews with the study group were conducted after three to four weeks of abstinence for accurate and reliable ADHD symptom assessment as Wilens and Fusillo suggested.<sup>20</sup> A previous review article also identified neurobiologic similarities between ADHD and craving.<sup>41</sup> These similarities of changes in the dopaminergic system (a reduction in D2/D3 receptor availability in the striatum and blunted dopamine release in the striatum after challenge with methylphenidate) suggest that patients with ADHD are more vulnerable to craving-like behavior.<sup>41</sup>

Another important finding is that although both IN and HI symptom severity were correlated with the severity of alcohol craving, IN symptoms predicted the severity of alcohol craving

**Table 3.** Predictors of Obsessive Compulsive Drinking Scale score in linear regression model

Model		Unstandardized coefficients		Standardized	t	p
		B	Std. Error	Coefficients Beta		
Step 1	STAI-State	0.082	0.100	0.112	0.817	0.416
	STAI-Trait	0.336	0.138	0.321	2.433	0.017
	BDI	0.090	0.096	0.129	0.946	0.347
Step 2a	STAI-State	0.051	0.098	0.070	0.521	0.604
	STAI-Trait	0.233	0.140	0.222	1.664	0.100
	BDI	0.054	0.094	0.077	0.574	0.567
Step 2b	ASRS	0.219	0.089	0.293	2.457	0.016
	STAI-State	0.074	0.099	0.101	0.743	0.460
	STAI-Trait	0.223	0.140	0.213	1.598	0.114
	BDI	0.029	0.095	0.042	0.305	0.761
Step 2c	ASRS-IN	0.434	0.194	0.304	2.234	0.029
	ASRS-HI	0.041	0.169	0.032	0.242	0.810
	STAI-State	0.064	0.097	0.087	0.659	0.512
	STAI-Trait	0.229	0.140	0.218	1.633	0.107
	BDI	0.042	0.094	0.060	0.443	0.659
	ASRS-6	0.678	0.271	0.299	2.503	0.015

ASRS: Adult ADHD Self-Report Scale; ASRS-IN: ASRS-Inattentive; ASRS-HI: ASRS-Hyperactivity/Impulsivity; STAI: Spielberger State-Trait Anxiety Inventory-State; BDI: Beck Depression Inventory. In Step 1 depression, state and trait anxiety scores were entered as independent variables. In Step 2a ASRS-18 score, in Step 2b inattentive and hyperactive/impulsive subscales of ASRS were entered as independent variables instead of ASRS-18 score. Finally in Step 2c ASRS-6 score was entered in the analysis as independent variable instead of subscales of ASRS-18. Step 1:  $F=7.71$ ,  $df=3, 74$ ,  $p<0.001$  Adjusted  $R^2=0.207$ , Step 2a:  $F=7.69$ ,  $df=4, 73$ ,  $p<0.001$  Adjusted  $R^2=0.258$ , Step 2b:  $F=6.50$ ,  $df=5, 72$ ,  $p<0.001$  Adjusted  $R^2=0.263$ , Step 2c:  $F=7.76$ ,  $df=4, 73$ ,  $p<0.001$  Adjusted  $R^2=0.260$ .

**Table 4.** Predictors of Obsessive and Compulsive subscale scores of Obsessive Compulsive Drinking Scale in linear regression models

Model		Unstandardized coefficients		Standardized	t	p
		B	Std. Error	Coefficients Beta		
<b>Obsessive</b>						
1a	STAI-State	0.044	0.051	0.117	0.858	0.394
	STAI-Trait	0.160	0.073	0.297	2.175	0.033
	BDI	-0.025	0.049	-0.070	-0.515	0.608
	ASRS-18	0.097	0.047	0.251	2.062	0.043
1b	STAI-State	0.050	0.051	0.133	0.978	0.331
	STAI-Trait	0.158	0.074	0.295	2.156	0.034
	BDI	-0.030	0.050	-0.084	-0.610	0.544
	ASRS-6	0.293	0.142	0.252	2.062	0.043
<b>Compulsive</b>						
2a	STAI-State	0.007	0.058	0.016	0.120	0.905
	STAI-Trait	0.073	0.083	0.121	0.879	0.382
	BDI	0.079	0.056	0.195	1.417	0.161
	ASRS-18	0.123	0.053	0.283	2.308	0.024
2b	STAI-State	0.014	0.058	0.033	0.244	0.808
	STAI-Trait	0.070	0.083	0.116	0.841	0.403
	BDI	0.072	0.056	0.177	1.282	0.204
	ASRS-6	0.385	0.161	0.292	2.385	0.020

ASRS: Adult ADHD Self-Report Scale; ASRS-IN: ASRS-Inattentive; ASRS-HI: ASRS-Hyperactivity/Impulsivity; STAI: Spielberger State-Trait Anxiety Inventory-State; BDI: Beck Depression Inventory; In Step a depression, state and trait anxiety and ASRS-18 scores were entered as independent variables. In Step b ASRS-6 score was entered in the analysis as independent variable instead of ASRS-18. Step 1a:  $F=6.55$ ,  $df=3, 74$ ,  $p<0.001$  Adjusted  $R^2=0.224$ , Step 1b:  $F=6.55$ ,  $df=4, 73$ ,  $p<0.001$  Adjusted  $R^2=0.224$ , Step 2a:  $F=6.28$ ,  $df=4, 73$ ,  $p<0.001$  Adjusted  $R^2=0.215$ , Step 2b:  $F=6.40$ ,  $df=4, 73$ ,  $p<0.001$  Adjusted  $R^2=0.219$ .

rather than HI. Since impulsivity is related with alcohol craving and relapse in alcohol dependents,<sup>42</sup> one can expect HI to be the predictor of craving, rather than IN. Infact consistent with our finding, studies conducted among patients with smoking addiction<sup>43</sup> and cannabis use disorder<sup>25</sup> found IN associated with the craving. After quitting smoking craving to smoke was correlated with only 1 HI symptom of ADHD, whereas it was correlated with 5 IN symptoms of ADHD.<sup>43</sup> Research results indicate that current and childhood IN were independently associated with more severe cannabis use, craving, and problem use-related outcomes in young adulthood and that childhood HI symptoms were associated with earlier initiation of cannabis.<sup>25</sup> Bidwell et al.<sup>25</sup> suggested that these findings are broadly consistent with models that suggest HI is associated with greater impairment in childhood with IN emerging as a more salient predictor of outcomes later in development.<sup>44,45</sup> It was suggested that the association of executive function deficits with IN rather than IH<sup>46</sup> may be the root of mediational chain to substance use.<sup>47,48</sup> Thus, HI may be more strongly associated with initiation/early use of alcohol, whereas IN in adulthood may be a predictor of alcohol use-related outcomes and craving once AUD is established.<sup>25</sup>

The analysis of the relationship between craving and the clinical characteristics of dependent patients point out that severity of anxiety<sup>49</sup> and depression<sup>50</sup> are the two of the most significant predictors of craving. Negative affect such as depression and anxiety was found to be directly related with the alcohol craving<sup>6,26</sup> and was also found to have a mediator role on the relationship between other variables such as alexithymia, dissociation and craving.<sup>27</sup> A large randomized controlled study demonstrated anxiety to be selectively associated with relief craving for alcohol, thus bolstering the hypothesis that craving may be advanced as a plausible mediator of the association between negative affect and alcohol misuse.<sup>51</sup> Analysis of this mediational path in another study revealed that negative affect was associated with increased alcohol use, and the relationship was statistically mediated by alcohol craving.<sup>52</sup> A recent study conducted among outpatients with depressive or anxiety disorders found that 19.3% received an ADHD diagnosis and these patients with ADHD diagnosis scored significantly higher for depression, and state and trait anxiety than those without.<sup>53</sup> It was

also reported that IN symptoms were associated with anxiety symptoms much stronger than HI symptoms in a large population based study.<sup>54</sup> Although trait anxiety predicted the severity of craving, when the severity of ADHD symptoms was entered in the model it was the only predictor for severity of craving. Nevertheless trait anxiety seems to be related with the obsessive component of the craving but not with the compulsive component. Thus severity of ADHD symptoms, particularly IN, may be related with both craving components directly and also may be related with obsessive component of the craving indirectly through trait anxiety. Our results also suggest that the impact of trait versus state anxiety on two components of ADHD may differ.

Taking the same results for ASRS-18 and ASRS-6 in statistical analyses suggest that ASRS-6 with much less items can be used among this population. Given its accuracy, ease of administration and time-effectiveness, ASRS-6 as a screening tool may be especially efficacious for the detection of comorbid ADHD in drug treatment centre settings. Therefore, this assist the tailoring of AUD treatment according to patients and it may also enable additional integrated treatments of adult ADHD and AUD.

The present study also has some limitations. First, because this study is cross-sectional, its findings cannot indicate the causal relationships among the primary constructs of interest. Second female patients may have a different profile concerning ADHD and craving. It is also important to note that while validated and widely used tools in the literature, the ASRS-18 and ASRS-6 indicate ADHD symptom presence and do not definitively indicate ADHD diagnosis. Therefore, our results refer specifically to IN and HI symptoms and not clinically diagnosed ADHD cases. But accumulating evidence suggest that ADHD exists at the extremes of symptom distributions and ADHD symptoms are dimensional rather than categorical.<sup>55</sup> Dimensional approach is also more effective in capturing clinical and research data than the categorical approaches.<sup>56</sup> Finally, the generalizability of the findings of the present study to the wider, non-treatment seeking, mixed-gender population with alcohol use disorder requires further study.

Nevertheless, at the minimum, these findings suggest that to better understand craving among patients with AUD, clinicians must carefully evaluate ADHD symptoms, particularly IN

component, and trait anxiety among this population. Screening of ADHD and anxiety symptoms and making a personal treatment plan

according to patient characteristics may provide better treatment outcomes when handling the alcohol craving.

**Authors' contributions:** M.B.: finding subject, design of the study, data acquisition and process, literature review, manuscript writing; C.E.: finding subject, design of the study, data analysis and interpretation, manuscript review; G.U.: finding subject, design of the study, data acquisition and process, data analysis and interpretation, manuscript writing; R.A.: data acquisition and process, literature review, manuscript writing; B.E.: design of the study, literature review, manuscript writing.

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