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Lack of associations of substance use and mental health with self-reported pain scores among emergency department patients

The most common complaint among Emergency Department (ED) patients is pain [1]. Pain scores have been shown to be influenced by factors such as race, age, and gender [2-4]. Addiction disorders are frequently encountered in the ED environment [5-7].

The Addiction Severity Index (ASI) is a validated measurement tool as objectively assess addiction [8,9]. This study was undertaken to measure the prevalence and severity of addiction and its relationship to self-reported pain and mental illness among ED patients.

This prospective survey study was conducted at Miami Valley Hospital, an urban hospital emergency department. The study was approved by the Wright State University Institutional Review Board. Participants were enrolled by research assistants during June through August of 2018. Eligible participants were at least 18 years of age with a triage pain score of 1 or higher (on a 0–10 scale). Primary outcome measures included substance abuse, mental health, and self- reported pain scores. Portions of the ASI used in this study included information regarding alcohol use, drug use, and mental health.

Among 473 eligible participants, 360 consented to participate (76% participation rate). The mean age was 40 (range 18 to 85). Participants reported an average triage pain score of 7 (range 1 to 10). The current episode of pain had a mean duration of 2 days. In addition, 49.5% of participants suffered from chronic pain, including back pain (25%), migraine headache (6%), neck pain (6%), and other types of chronic pain (63%).

The most common substance reported was alcohol. Forty-one percent ($N = 146$) of participants reported some alcohol use in the past 30 days, with 8% reporting drinking to intoxication (Fig. 1). Cannabis use was also commonly reported. Twenty-seven percent ($N = 96$) of participants reported cannabis use in the past 30 days, with the majority reported use at least 3 times (78%) and a minority reporting daily use (33%) (Fig. 2). Other substances reported by participants included cocaine (3%; $N = 11$), amphetamines (2%; $N = 6$), heroin (1%; $N = 2$), other opiates (18%; $N = 64$), and other substances (11%; $N = 40$).

The prevalence of mental illness was high. Within the past 30 days, 34% ($N = 122$) of patients reported experiencing serious anxiety or tension and 27% ($N = 96$) reported difficulty understanding, concentrating, or remembering, and 22% ($N = 79$) reported serious depression. Four percent ($N = 11$) reported serious thoughts of suicide. A significant number of participants had been treated for mental health as an outpatient (28%; $N = 100$) or as an inpatient (21%; $N = 77$).

There was no association between self-reported pain scores and substance use. Anxiety was associated with higher self-reported pain scores ($p = 0.03$) (Table 1). There was no association between chronic pain and triage pain scores. Participants with chronic pain were more likely to experience higher rates of depression, anxiety, and suicidal thoughts ($p < 0.001$; Table 2).
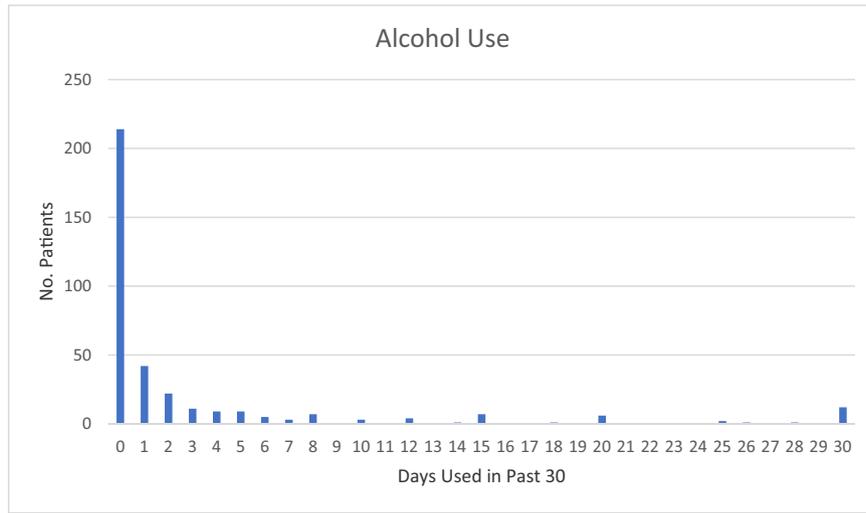
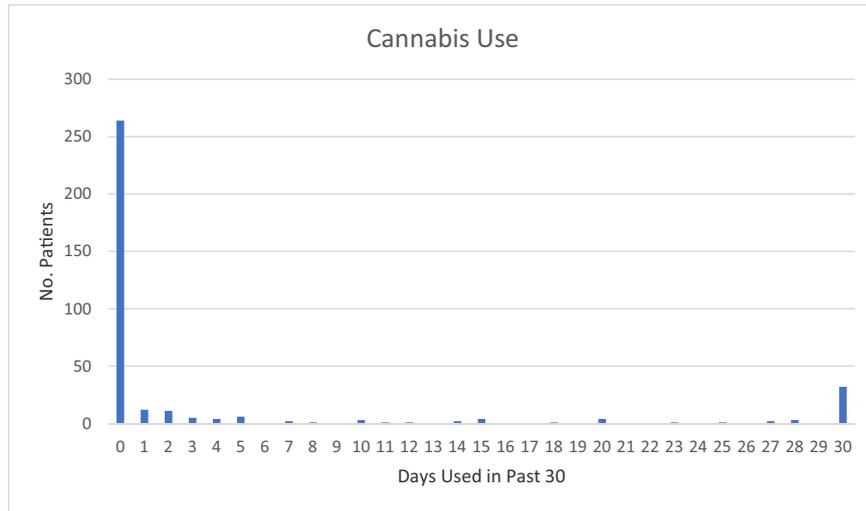**Fig. 1.** Alcohol use in the past 30 days among ED patients.

Fig. 2. Cannabis use among ED patients in the past 30 days.

Table 1
Associations between Substance Use and Self-Reported Triage Pain Score.

	No. patients	Triage Pain Score median [IQR]	Wilcoxon or Kruskal Wallis *p*-value
Chronic pain	178	8 [5 to 9]	0.56
No chronic pain	182	7 [6 to 9]	
Alcohol (any use at all)			0.81
0	214	8 [6 to 9]	
1–2	64	7 [6 to 9]	
3 or more	82	7 [5 to 9]	
Heroin			0.19
0	358	7 [6 to 9]	
1–2	0	–	
3 or more	2	9 [9 to 9]	
Cocaine			0.19
0	349	7 [6 to 9]	
1–2	7	9 [5 to 10]	
3 or more	4	9.5 [7.5 to 10]	
Amphetamines			0.25
0	354	7 [6 to 9]	
1–2	2	9.5 [9 to 10]	
3 or more	4	7 [4.5 to 9]	
Cannabis			0.41
0	264	7 [6 to 9]	
1–2	23	7 [6 to 9]	

These data demonstrate high use of alcohol, cannabis, and other substances among ED patients. The emergency department is potentially an ideal place to identify and intervene for substance use disorders, which are currently considered to be underdiagnosed [10,11]. Two common substances abused by the general population presenting to the emergency room are cannabis and alcohol, both of which are known to be used for self-medication [12].

In conclusion, alcohol use and cannabis use were commonly reported in this ED patient population. The prevalence of mental illness was high. There was no association between self-reported pain scores and substance use. Anxiety was associated with higher self-reported pain scores. Participants with chronic pain were more likely to experience higher rates of depression, anxiety, and suicidal thoughts.

Table 2
Associations between chronic pain and mental health.

	No. patients	% with depression	% with anxiety	% with suicidal thoughts
No chronic pain	182	19 (10.4%)	43 (23.6%)	1 (1.0%)
Chronic pain	178	60 (33.7%)	79 (44.4%)	13 (7.3%)
Chi-square p-value		<0.001	<0.001	<0.001

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Risk stratification and timing for invasive approach in patients with non-STEMI

We decipher with interest the study by Langabeer II et al. with large cohort [1], which provide visionary points about gender disparities in patients presenting with non-STEMI acute coronary syndrome. Although its well-designed conception, we want to address some points that need more attention.

The paper [1] clearly demonstrated that males presenting with non-STEMI in younger ages, as expected. But in females, the course of the disease is more catastrophic because of the fact that women have more diabetes. Beside these findings consistent with the literature, the guidelines recommend that quantitative assessment of ischemic risk because of its superiority to the clinical assessment alone [2]. The most accurate stratification of risk is the GRACE risk score [3] recommended by European guidelines for the management of acute coronary syndromes in patients presenting without persistent ST-segment elevation, as long as TIMI [4,5]. Patients with non-STEMI must be evaluated immediately by risk scores to identify individuals with life-threatening arrhythmias and those with ongoing myocardial ischemia requiring close surveillance as well as emergent coronary angiography [6]. Although the risk is highest at presentation and decreases rapidly over time, also it may remain high for several days due to comorbidities, coronary anatomy and revascularization [7]. Furthermore, concomitant diseases, drugs used and major bleeding are associated with increased mortality. Furthermore, it is advisable to use bleeding risk score, namely CRUSADE [8], for achieving balanced treatment strategy. In addition to the findings related to gender disparities in this study population, it would be more appropriate to evaluate the risk stratification and also the above-mentioned risk factors to conclude the results.

Therefore, coronary angiography and treatment of culprit lesions by percutaneous coronary intervention should be performed in patients with non-STEMI. However, approximately one fourth of non-STEMI patients have angiographically normal or non-obstructive coronary arteries. The indication for an invasive approach, the timing for myocardial revascularization (immediate invasive strategy (<2 h), early invasive strategy (<24 h), invasive strategy (<72 h), selective invasive strategy) and the selection of the revascularization modality depend basically on clinical features and risk stratification as outlined before [6]. Langabeer II et al. found in their cohort that patients with non-STEMI who presented later, have longer emergency length of stay, are less likely to receive an early invasive management approach [1], as expected. All in all, longer emergency department length of stay and longer delay in seeking treatment after their symptom onset should be necessary for assessment of clinical, ECG, and cardiac biomarkers which is mandatory for risk scoring. We want to emphasize that findings will be more reliable and valuable, with a better study design where these clinical scoring systems and clinical freatures are used as well as gender.

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