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# Patterns and sociodemographic characteristics of substance abuse among hepatitis C virus-infected patients in Iraq: a cross-sectional study

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## Abstract

**Background** Substance use disorders are a widely recognized problem among hepatitis C-infected patients; moreover, substance abuse by intravenous injection is a common mode of transmission of the hepatitis C virus worldwide. The frequency of substance use disorders and their relation to hepatitis C infection are still unknown in Iraq. This cross-sectional study, conducted among a sample of hepatitis C-infected patients attending the Gastrointestinal Tract Center in Baghdad Medical City, aimed to examine the prevalence of substance use disorders, the sociodemographic characteristics of the abusers, and the relation between intravenous drug abuse and hepatitis C virus infection. All participants were subjected to an Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST) questionnaire and a data form to determine sociodemographic characteristics and hepatitis C virus-related risk factors.

**Results** In a total of 300 hepatitis C virus-infected patients, the prevalence of substance use disorders was 53.6%. Among these patients, 43.6% abused nicotine, 6% abused licit drugs, and 4% abused alcohol. No one reported illicit drug abuse. Intravenous drug abuse was rare, and there was no relationship found between intravenous drug abuse and hepatitis C infection. Cupping (23%) and blood transfusion (20.3%) were both significantly associated with hepatitis C transmission in this study ( $p > 0.001$ ).

**Conclusion** This study revealed a high prevalence (53.6%) of substance abuse in this sample of hepatitis C-infected patients, with nicotine being the most commonly abused substance. However, there was no relationship between hepatitis C infection and intravenous drug abuse. Common risk factors that might contribute to hepatitis C transmission among this population include cupping and blood transfusion.

**Keywords** Substance abuse, Alcohol, Drug, Iraq, Prevalence, ASSIST, Viral hepatitis

## Background

Substance use disorder (SUD) is a complex condition involving patterns of symptoms caused by the uncontrolled use of a substance despite its harmful consequences [1]. Substance abuse is a serious public health problem throughout the world [2]. The World Health Organization (WHO) reported that approximately 1 billion people smoke tobacco worldwide, despite the fact that tobacco is the main cause of morbidity and mortality [3]. Alcohol abuse is also a serious and prevalent mental disorder; however, WHO data reveal that 76.5 million

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people struggle with alcohol-related disorders [4]. Furthermore, nearly 5% of people aged 15–64 consume illicit drugs worldwide [5]. Cannabis and Amphetamine-type stimulants (ATS) are the two most frequently abused illicit drugs, with a global annual prevalence of 2.6–5% and 0.3–1.2%, respectively [6]. Licit drugs (prescription medications), such as sedatives, analgesics, hypnotics, and opioid substitution drugs, are largely misused to produce psychoactive effects. The United Nations International Narcotics Control Board expects that misuse of licit drugs will overcome illicit drug abuse globally [7]. It has been shown that women and individuals from lower social classes are more prone to misuse prescription drugs [8, 9]. In the United States (US), prescription medicines are the second most abused drugs after cannabis [10].

In Iraq, a few epidemiological studies on SUD were conducted before 2003, which may align with the fact that Iraq had the lowest rates of substance abuse, according to WHO reports from 2002 [11]. After 2003, there was considerable evidence of an increase in drug abuse and long-term mental health conditions like depression [12, 13]. The substances commonly abused in Iraq are alcohol and prescription medicines, such as tramadol, benzodiazepines, codeine, and benzhexol, and there has been an increase in the abuse of hashish and ATS in some regions. Substance abuse is predominant among young males, and licit drug abuse is the most common type, as there are few restrictions on these drugs, which can be obtained without prescription [14]. The Iraqi National Household Survey on Alcohol and Drug Use (INHSAD) revealed that lifetime tobacco use was reported by 28.8%, lifetime alcohol use by 8.1%, licit drug use by 2.9%, and illicit drug use by 0.3% [15], while the Iraqi Mental Health Survey found lifetime alcohol abuse to reach a rate of 6.8% among men and 0.6% among women, and the lifetime prevalence of licit drug misuse was 7% [16]. Before 2009, Iraqi authorities frequently seized cannabis, with opium accounting for 15% of all drugs in 2010; however, this rate dropped to 5% in 2011 [14].

Hepatitis C virus (HCV) infection is increasingly recognized as a significant healthcare problem worldwide, with more than 170 million people suffering from this chronic infection [17]. HCV is highly prevalent among injection drug users (IDUs) [18]. IDUs acquire infection by coming into contact with blood during the act of injecting, as a result of sharing needles, syringes, and other injection equipment [19]. In Iraq, there is a low endemicity of both the hepatitis B virus and HCV, with prevalence rates of 1.6% and 0.4%, respectively [20]. In contrast, HCV prevalence among IDUs in Saudi Arabia ranged from 14.4% to 74% [21]. In the U.S., 75–90% of long-term IDU showed hepatitis C seroprevalence [22]. As the above numbers

demonstrate, intravenous drug abuse is the main risk factor for HCV transmission [23]. In light of these findings, our study was conducted to identify the prevalence of substance use disorders among HCV-infected patients, their sociodemographic characteristics, and the relationship between intravenous drug abuse and HCV infection.

## Methods

### Study design and participants

This cross-sectional study was conducted at the Gastrointestinal Tract Center, Baghdad Medical City, Baghdad, Iraq. The participants were hepatitis C-infected patients who attended the outpatient clinic of the Center to receive treatment and follow-up. The total patients were 1600; 310 patients were involved in the study according to an online sample size calculator with the following equation:

$$n = [DEFF * Np(1 - p)] / [(d^2 / Z_{1-\alpha/2}^2 * (N - 1) + p * (1 - p)].$$

Population size ( $N$ ) = 1600

Hypothesized % frequency of outcome factor in the population ( $p$ ): 50% ± 5

Confidence limits ( $d$ ) = 5%

Design effect ( $DEFF$ ) = 1

Z score = 1.96

Sample size =  $n$ .

Ten patients did not complete the interview, so the number of respondents was reduced to 300. The data were collected once a week from May 2017 to October 2017 and purposive sampling method was used. We included both genders who were medically stable and over 18. Those who were severely ill and declined to participate were excluded.

### Data collection

All patients were subjected to the following:

1. Patients had to complete a form to determine their sociodemographic characteristics and HCV-related risk factors (age, gender, residence, occupation, education and marital status, and crowding index, which was determined by dividing the number of people living in the house by the number of rooms). The assessed risk factors related to HCV transmission include injection drug use, tattoos, surgery, dialysis, dental procedures, cupping, and blood transfusions.

2. Patients had to complete the WHO ASSIST (Arabic version) to screen for psychoactive substance use.

The Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST) is a brief screening tool used in primary care and other settings to determine whether

people use psychoactive substances. It was developed by the WHO and validated in Arabic as a simple method of screening for hazardous, harmful, and dependent use of substances [24, 25]. There are eight questions on the ASSIST (the first seven inquire about the usage and problems associated with alcohol, tobacco, cocaine, cannabis, ATS, inhalants, sedatives, opioids, and hallucinogens; the eighth concentrates on injecting and inquires whether the patient has ever injected any drug). Accordingly, ASSIST provides information about:

- ✓ Substance people have ever used in their lifetime.
- ✓ Substances they have used over the last three months.
- ✓ Dependence.
- ✓ Injection drug use.

Specific substance involvement scores for all substances except alcohol are scored as follows: 0–3 indicates low risk, 11–26 indicates moderate risk, and 27+ indicates high risk. For alcohol, 0–10 indicates low risk, 11–26 indicates moderate risk, and 27+ is associated with high risk. A low risk score means that there is a lower risk associated with the use of the involved substance, moderate risk score means harmful or hazardous use of that substance, and high-risk score means there is a high risk of substance dependence.

**Statistical analysis**

IBM© SPSS© (Statistical Package for the Social Sciences) Version 22 and Epi Info™ 7 were used for data tabulation, input, and coding. For descriptive analysis, frequencies were applied in various categories. The Chi-square test (95% confidence interval) was used to investigate the associations between variables; a p value of less than 0.05 was considered significant, while a p value less than 0.001 was considered highly significant.

**Ethical approval**

The aims of the study were explained to the patients before data collection, and all patients signed an informed consent form to participate in the study. All the data used in this study were kept confidential. The study was approved by the scientific council of psychiatry of the Arab Board for Health Specializations (No. 183, February 5th, 2017).

**Results**

**Descriptive characteristics of the sample**

The researcher approached 310 HCV-infected patients, of whom 300 adults responded (response rate: 96.7%). The mean age of the respondents was 39.1 ± 13.2 years; more than half were male (53.6%), married (69.7%), and

**Table 1** Socio-demographic characteristics of HCV-infected patients (n=300)

Variables (n=300)		
Age (mean, SD)	39.1 ± 13.2	
	No.	%
Gender		
Male	161	53.6
Female	139	46.3
Residence		
Urban	202	67.3
Rural	98	32.6
Occupation		
Employed	181	60.3
Unemployed	119	39.6
Education		
Illiterate	44	14.7
Primary	121	40.3
Secondary	86	28.7
Graduate	49	16.3
Marital state		
Single	52	17.3
Married	209	69.7
Divorced	39	13
Abused substance (ASSIST)		
Nicotine abuser	131	43.6
Alcohol abuser	12	4
Licit drug abuser	18	6
Illicit drug abuser	0	0
Non-abuser	139	46.3

employed (60.3%). Most lived in urban areas (67.3%); 40.3% had only a primary education. The prevalence of substance abuse was 53.6% (n=161) in this sample, with 43.6% abusing nicotine, 6% licit drugs, and 4% alcohol. No one reported illicit drug abuse, as shown in Table 1. A total of 161 patients were substance abusers, who were then divided into three groups according to the abused substance, as shown in Table 2.

**Tobacco abuse group**

A total of 43.6% reported tobacco abuse; the mean age was 39.4 years (SD 4.2); the highest age group was 48+ with 39 patients (13%), 100 patients (33.3%) were of male gender, 89 patients (67.9%) were living in urban areas, 102 patients (77.8%) were employed, 87 patients (66.4%) were married, and 52 patients (39.7%) received primary education in an area with a high household crowding index (HCI) 2.03.

**Table 2** Socio-demographic characteristics of the substance abuse groups (n = 161)

Variables (n = 161)	Tobacco (n = 131)		Alcohol (n = 12)		Licit drug (n = 18)		Chi-square P value
	No.	%	No.	%	No.	%	
Age (years)							
18–27	36	12.0	1	0.3	3	1.0	0.003
28–37	32	10.7	1	0.3	7	2.3	
38–47	24	8.0	9	3.0	2	0.7	
48–	39	13.0	1	0.3	6	2.0	
Gender							
Male	100	33.3	12	4.00	4	1.33	0.001
Female	31	10.3	0	0.00	14	4.66	
Residence							
Urban	89	67.9	12	100	16	88.9	0.003
Rural	42	32.1	0	0	2	11.1	
Occupation							
Employed	102	77.8	9	75	7	38.8	0.002
Unemployed	29	22.1	3	25	11	61.1	
Education level							
Illiterate	18	13.7	2	16.7	5	27.8	0.819
Primary	52	39.7	4	33.3	7	38.9	
Secondary	34	26	4	33.3	3	16.7	
Graduate	27	20.6	2	16.7	3	16.7	
Marital state							
Single	24	18.3	3	25	1	5.56	0.184
Married	87	66.4	6	50	16	88.9	
Divorced	20	15.2	3	25	1	5.55	
HCI mean (SD)	2.037	1.237	1.43	0.479	1.762	0.633	

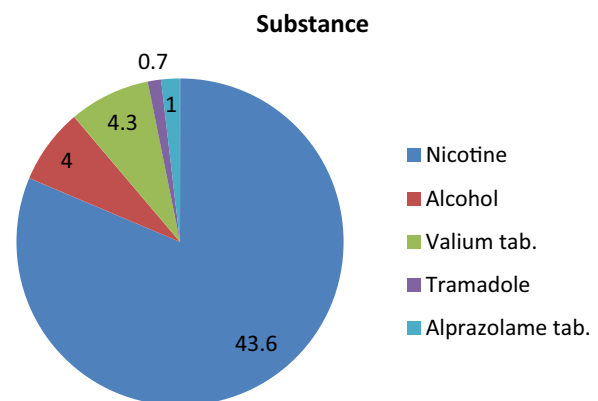
\* P < 0.05 significant p < 0.001 High significant \* HCI housing crowding index (HCI > 1 indicate crowding)

**Alcohol abuse group**

Of the participants, 4% reported alcohol abuse; the mean age was 43 years (SD 8.99); the highest age group was 38–47 years with nine patients (3%), exclusively male gender; 12 (100%) of the patients lived in urban areas. Most of them were employed (75%), and less than half had received primary and secondary education (0.33%). Six patients (50%) were married and a high mean HCI (1.4) was revealed.

**Licit drug misuse group.**

Of all patients, 6% reported licit drug abuse, with this use being distributed as follows: diazepam tablets by 4.3%, tramadol tablets by 0.7%, and alprazolam tablets by 1%, as shown in Fig. 1. Their mean age was 39.5 years (SD 11.55), and the highest age group was 28–37 with seven patients (2.3%); 14 (4.66%) were females, the majority lived in urban areas and were married 16 (88.9%), 11 patients (61.1%) were unemployed, and seven patients (38.9%) received primary education in an area with a high HCI of 1.7.

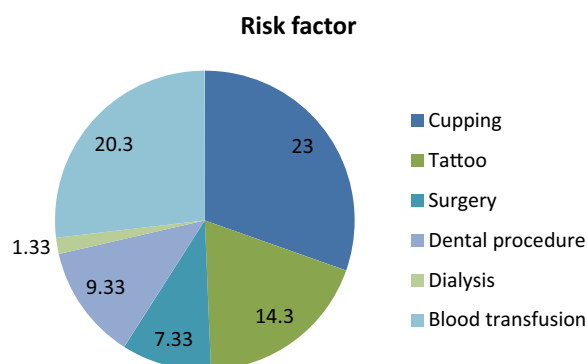


**Fig. 1** Types of abused substances

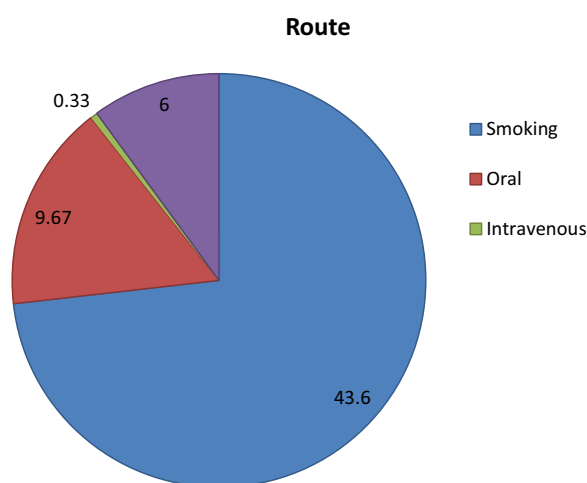
**Illicit drug abuse group**

No one reported abusing such drugs.

A univariate analysis showed a significant association between substance abuse and gender, residence (urban), employment, and a high mean HCI. No significant differences were observed between substance abuse and



**Fig. 2** Risk factors related to hepatitis C infection



**Fig. 3** Route of consuming the substances

other variables (education and marital status), as shown in Table 2. In terms of the route of administration, smoking was the most common route for 131 patients (43.6%), as shown in Fig. 2. Regarding the risk factors identified in the study, the most relevant risk factor for HCV transmission was cupping which had been reported by 69 patients (23%), as shown in Fig. 3.

### Discussion

To our knowledge, no data are available on substance use disorders among HCV-infected patients in Iraq. Nevertheless, worldwide studies show higher infection rates among drug abusers compared to the general population, especially among those who inject drugs.

#### Socio-demographic characteristics

The mean age of our study sample was 39.1 + 13.2 years which aligns with a study conducted in France [26], with 53.6% of male gender similar to Garfein et al., while 69.7% were married contrary to Garfein et al. [27] in

which majority were never married due to Islam encourage marriage, 52.3% employed, 40.3% received primary education, and 67.3% of urban background.

#### Tobacco abuse group

The INHSAD revealed current tobacco use 23.4%, largely in males; highest age group is 18–34 years by 33.1%, most of them were employed 41.2%, were widowed or divorced 32.4% of the contrary to our study (married 66.4%), 36.8% achieve primary education, and HCI is 2.5 [15]. Other two studies in Iraq including the Iraqi Family Health Survey and the Iraqi Ministry of Health Non-communicable Disease Risk Factor Survey reported tobacco use to be 14.8% and 21.9%, respectively [28, 29]. Whereas Butt's study in the United States revealed 6.1% abuse tobacco which is lower than our study, their mean age was 57 years, predominantly of male gender 57.6% [30].

The reasons for these differences may be due to different study design characteristics, such as sample size, measurement tools, and study methods, while Hezode study found most participants (40%) were tobacco abusers similar to our study [26].

#### Alcohol abuse group

In The INHSAD survey, current alcohol abuse was 3.4% nearly the same as our study (4%), males have a higher value than women, urban higher than rural, married, and finally, primary education are consistent with our study [15]. A similar result was found in an Indian study in which alcohol abuse was exclusively male and participants achieved primary education [31]. In the Al-Hemairy study in Iraq, the lifetime prevalence of alcohol abuse was 16.7%; exclusively in males, the peak age was 24–35 years, and the majority were illiterate (73%), with a high HCI [32]. In contrast, the Hezode study, Butt study, and Fireman study, the alcohol abuse rate was 13.3%, 14%, and 21% respectively, all higher than our study but similar in being exclusively in males [26, 30, 33]. This high rate is due to the Islamic prohibition of alcohol, and all participants were obliged to avoid alcohol because of their liver disease.

#### Licit drug misuse

In our study, women were more likely than men to abuse prescription drugs. The most common drugs reported to be abused were painkillers (tramadol) and antianxiety drugs (diazepam and alprazolam); the female-specific conditions of dysmenorrhea and the high rate of anxiety disorders in women could partly explain these findings [35]. Another explanation is the different healthcare system approach between men and women [34]. These findings are consistent with those reported in a Swedish study [9]. The INHSAD showed that 1.2% of respondents

used licit drugs, which was lower than in our study 6%, with a higher male preponderance which differs from our study. The highest age group (18–34 years) similar to our study, as was the finding that most were unemployed, significant number were widowed or divorced, which is contrary to our study showing that most were married [15]. In contrast, Alhasnawi found a lifetime prevalence 0.7% which is very low compared to most studies conducted in Iraq, including our study; however, higher numbers of men and widowed or divorced could be explained by this study having been completed during the year of violence 2006 and the exclusion of residents of dangerous areas [16]. In this sense, it should be noted that Al-Hemairy's study revealed lifetime prevalence of 7%, and a peak age of 24–35 years, along with male exclusivity. This is contrary to our study, in which female use was predominant. Likewise, 15% were illiterate, and primary education numbers were similar to those of our study [32].

#### **Illicit drug abuse**

In our study, no one use such drugs, while in the INHSAD, current use was 0.2% (cannabis, inhalants, Captagon, opium) [15], the Hezodes' study revealed that 24.1% were daily cannabis users, and 7.3% were on methadone and buprenorphine, as these are commonly abused drugs in Europe [26]. Similarly, studies in Iran have found a high prevalence of illicit drug abuse, as in Amiri's study, where illicit drug use was divided among opium (51.7%), heroin (18.3%), cannabis (12.4%), and others (17.6%). In this case, respondents had a mean age of 34.7 years, all of whom were of the male gender; 63.4% were married, 50% were illiterate or had a primary education, and 90% were smokers, which is in consonance with our study [36]. In Norouzian's study in Iran, the abused substances were heroin (17.9%), opium (7.1%), and methamphetamine (5.4%); most were male, 67% were employed, ages ranged from 19 to 51 years, 60% had less than a high school education, and 93% were single; this could be explained by the fact that in Iran, illicit drug abuse, especially opiates and cannabis, is highly prevalent [37]. Studies in Arabic countries, such as Saudi Arabia found that the majority of those abusing illicit drugs and alcohol were male, single, and had achieved a secondary education [48]. Also, studies in Kuwait and Syria showed that the majority of IDUs were males [49, 50].

#### **Route of consuming the substance**

In our study, the most common route of consuming the substance was smoking, followed by oral use, and only one participant reported an intravenous route. Nourouzi's study In Iran found that injection and inhalation were prevalent [37], which is contrary to our study, as in Iran the most commonly abused drugs are opiates, while

in Iraq, the most frequently abused substances are prescription drugs, alcohol and nicotine. Likewise, Amiri's study in Iran showed inhalation and oral route rates similar to those of our study [36].

#### **Risk factors for hepatitis C**

In our study, cupping and blood transfusion were the most common risk factors for hepatitis C infection, as in Iraqi society, cupping therapy is commonly practiced using unsterilized equipment. Also, transfusion of blood and blood products is still a major mode of HCV transmission in Arab countries, including Iraq, due to the lack of organized infrastructure and well-trained staff to meet the standards of modern blood transfusion systems [38]. In Iraq, studies by Khattab and Al-Kubaisy found blood transfusion to be the most common factor related to HCV acquisition [39, 40]. Similarly, a study conducted both Saudi Arabia and Iran revealed blood transfusion to be a common factor, as in our study [41, 42], where as another study in Saudi Arabia showed that intravenous drug use was most common due to the prevalence of opiates abuse in Saudi Arabia but remains uncommon in Iraq [43]. In Jordan, a history of blood transfusion, renal transplantation, and similar surgeries were common factors, similar to our study [44]. Similar risk factors, including dental procedures, history of surgery, and blood transfusions, were found to be related to HCV transmission in Turkey [45].

Contrary to the previous studies conducted in Arab countries, Canada, and the United Kingdom, the common mode of HCV acquisition was found to be intravenous drug abuse as a result of sharing needles and other equipment, and there is no significant role of blood transfusion, cupping or other surgery in HCV transmission [46, 47].

#### **Conclusion**

This study showed that substance abuse is common among HCV-infected patients (prevalence rate 53.6%). The most commonly abused substance was nicotine, while alcohol and licit drugs were less commonly abused. Smoking and oral use were the most common routes, while intravenous drug abuse was negligible, so there was no relationship between HCV infection and intravenous drug abuse found in this study. The most relevant risk factors for viral transmission were cupping and blood transfusions.

#### **Recommendation**

We need further studies with larger sample sizes, and other areas considered to evaluate the extent and effect of substance use among HCV-infected patients. Regular

screening of substance abuse among these patients is necessary.

### Limitation

The sample included those who sought treatment and attended the Gastrointestinal Tract Centre, while those who still asymptomatic or refuse treatment were not involved.

### Abbreviations

SUD	Substance use disorder
UNOC	United Nation Office on drug and Crime
WHO	World Health Organization
ATS	Amphetamine type stimulants
HCV	Hepatitis C virus
INHSAD	Iraqi national household survey on alcohol and drug use
IDU	Injection drug user
HCI	Housing crowding index

### Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s41983-024-00868-y>.

Additional file 1.

Additional file 2.

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### Author contributions

N. J. A.: selecting the research idea, study design, obtaining ethical approval, and supervision of data collection. N. A. H.: data collection, analysis, interpretation, manuscript writing, and submission. The final manuscript was read and approved by both authors.

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This research has not received any funding.

### Availability of data and materials

All data are attached with the supplementary file.

### Declarations

#### Ethical approval and consent to participate

The study was approved by the scientific council of psychiatry of Arab Board for health Specializations (No. 183, February 5th 2017). All patients signed an informed consent form to participate in the study.

#### Consent for publication

Not applicable.

#### Competing interests

There is no any competing interests.

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