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Awareness of Addictive Behaviors and Substance Use Among Healthcare Students in Syrian Universities: A Cross-Sectional Study

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Abstract

Background: The protracted Syrian conflict has precipitated a systematic collapse of healthcare infrastructure and a 300% surge in regional substance consumption 1, 4.

Methods: This analysis synthesizes cross-sectional data from multiple Syrian healthcare student cohorts, including a primary sample of 2,014 undergraduate medical students and secondary assessments of behavioral addictions 17, 20, 21.

Results: Regular cigarette smoking increases from 3.3% in the first year to 10.4% by the fifth year, while waterpipe tobacco smoking (WTS) reaches a 27.5% prevalence among clinical-year students 16. Self-medication is practiced by 66.8% of students, with 75.2% misusing antibiotics, and behavioral addictions such as smartphone addiction (62.5%) and problematic internet use (89%) are highly prevalent 17, 20, 21.

Conclusion: The high rates of substance use and comorbid burnout (73%) necessitate immediate curricular reform, including the integration of standardized addiction medicine competencies and non-stigmatizing support models 13, 15.

Keywords: Substance Use Disorders; Addiction Medicine; Tobacco Use; Waterpipe Smoking; Energy Drink Consumption; Healthcare Students; Medical Students; Addiction Education; Cross-Sectional Study; Syria

1. Introduction

1.1. The Socio-Political Landscape of Syria

Since 2011, Syria has experienced profound socio-political instability, massive internal displacement, and the systematic fragmentation of its health infrastructure 1, 2. This environment of chronic insecurity has fostered a public health crisis wherein overall substance consumption has increased by approximately 300% 4. Regional drug consumption patterns are heavily influenced by territorial divisions, with active drug use estimated at 5% in opposition-controlled areas and 11% in government-controlled territories 4.

1.2. The Rise of the Narco-State

Syria has emerged as a global hub for the illicit manufacture and trafficking of Captagon (fenethylline), a synthetic amphetamine-type stimulant 6, 8. By 2022, this trade evolved into a $10 billion industry, with approximately 80% of global seizures tracing back to Syrian origins 8, 9. Clandestine tablets are frequently adulterated with toxic levels of

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caffeine, ephedrine, quinine, and theophylline, posing unpredictable neurological risks to consumers who use the drug to maintain stamina under severe socioeconomic stress 10, 11.

1.3. Healthcare Students in Conflict Zones

Healthcare students in Syria face a "dual pressure" comprising rigorous academic demands and the continuous stress of living in a low-resource, conflict-affected society 13, 15. These pressures are linked to high rates of psychiatric comorbidities, including post-traumatic stress disorder (PTSD), severe clinical depression (93.0% prevalence in some cohorts), and generalized anxiety 1, 20. Consequently, severe burnout affects 73% of healthcare residents, driving a significant portion of the trainee population toward maladaptive coping mechanisms and substance misuse 14, 15.

1.4. Study Objectives

The objective of this research is to evaluate the prevalence of substance use, behavioral addictions, and addiction awareness within Syrian medical, pharmacy, and dental student cohorts 20. By identifying specific knowledge gaps and behavioral trends, the study aims to inform the integration of addiction medicine into the national healthcare curriculum 3, 40.

2. Methods

2.1. Study Design and Setting

A series of descriptive cross-sectional surveys were conducted across Syrian universities, focusing on medical trainees in both preclinical and clinical phases 16, 20. This design facilitates the simultaneous assessment of behavioral prevalence and awareness levels within the future healthcare workforce 1, 17.

2.2. Participants and Sampling

The analysis draws from multiple large-scale cohorts, including a sample of 2,014 undergraduate medical students for self-medication trends and 1,437 students for behavioral addiction assessments 17, 21. Smaller targeted cohorts, such as the 533-student sample at Damascus University, provide granular data on tobacco use progression 16.

2.3. Data Collection Tools

Research methodologies employed standardized metrics, including the Alcohol Use Disorders Identification Test (AUDIT), the Drug Abuse Screening Test (DAST-10), and the Young Internet Addiction Test 14, 20. To mitigate social desirability bias and the fear of criminalization—common in conflict zones—researchers emphasized anonymity and the clinical nature of the data 1, 5

2.4. Ethical Considerations

All participants provided voluntary consent, with data collection handled with strict confidentiality to protect students reporting on sensitive or illicit behaviors 1, 20. Ethical safeguards were implemented to ensure that the reporting of substance misuse did not result in academic or legal repercussions 1, 5.

3. Results

3.1. Demographic Profile

The synthesized cohort consists predominantly of undergraduate healthcare students aged 18 to 29 years, a demographic where national substance use prevalence has risen from 3% to 9% 4. Participants include a majority of males (80.88% in some regional subsets) and students experiencing high rates of internal displacement 1, 17.

3.2. Tobacco Prevalence

Tobacco use represents a primary behavioral coping mechanism, with prevalence rates significantly increasing as students progress to clinical years 16.

Table 1 Tobacco and waterpipe prevalence

Substance Type	Preclinical Prevalence (1st Year)	Clinical Prevalence (5th Year)
Cigarettes	3.3%	10.4%
Waterpipe Tobacco (WTS)	19.7%	27.5%

Male gender is a strong predictor of tobacco use, with approximately four times the odds for WTS (OR=3.99) and twice the odds for cigarettes (OR=2.36) compared to female peers 16.

3.3. Self-Medication and Prescription Misuse

Self-medication is prevalent in **66.8%** of the student population, primarily driven by growing clinical knowledge (55.2%) and a lack of health insurance (93.1%) 17. Analgesics are the most common medication class (86.5%), but **75.2%** of self-medicating students admit to antibiotic misuse 17.

3.4. Behavioral and Digital Addictions

Smartphone addiction affects **62.5%** of medical students, with those living in suburban outskirts showing higher risk (OR=1.5) 21. Problematic internet use (PIU) reaches an alarming **89%** , which is significantly correlated with clinical depression symptoms and environmental stressors like domestic violence (COR=2.136) 20.

3.5. Educational and Awareness Gaps

Knowledge deficits regarding addictive potential are prominent, as seen in regional counterparts where 52% of students possess poor addiction knowledge 25. In Syrian pilot programs, baseline tobacco-cessation knowledge was low (11.5/30), and non-completers of training courses exhibited more negative attitudes toward cessation 13.

4. Discussion

4.1. Interpretation of Local Findings

The high prevalence of tobacco and behavioral addiction correlates with the 73% burnout rate and 93% depression rate observed in Syrian medical cohorts 15, 20. Students often utilize stimulants and tobacco to manage intense academic stressors and war-related trauma, which is further mediated by PTSD and anxiety disorders 1, 18. The high-risk nature of local use is underscored by findings that 98.04% of active drug users in certain Syrian districts engage in intravenous use without HIV testing 1.**5.2 Regional Comparative Analysis** Syria's substance use landscape exists within a broader Middle Eastern context characterized by high academic pressure and varying social norms 23, 28.

Regional Comparison of Healthcare Student Substance Use *Table 2*

Table 2 Regional Comparison of Healthcare Student Substance Use

Country	Key Prevalence / Finding	Source
Jordan	13.76% overall substance use; pharmacy students at highest risk (OR=4.85)	[23]
Iraq	54.6% meet criteria for active substance abuse in Baghdad	[28]
Lebanon	83.2% alcohol consumption rate; 46.8% lifetime illicit drug use	[30, 32]
Egypt	40.0% reported involvement in substance misuse in the Delta region	[19]
Saudi Arabia	52.0% possess poor or insufficient clinical addiction knowledge	[25]

4.2. Cultural and Curricular Barriers

Social stigma and the "moral failing" view of addiction remain significant barriers to treatment and accurate reporting 37. Educational deficits are reinforced by the lack of standardized training; for example, 68.5% of nursing students in Iraq falsely believe waterpipe smoking is less addictive than cigarettes 29

4.3. The Captagon Factor

Captagon availability in the narco-state economy directly influences student awareness and potential misuse 8, 11. While the substance is used to maintain focus, the presence of clandestine adulterants like quinine and ephedrine poses unpredictable neurological risks to the future medical workforce 10, 11.

5. Conclusion & recommendations

5.1. Summary of Findings

Syrian healthcare students are a high-risk cohort vulnerable to substance use, behavioral addictions, and severe mental health strain 17, 20, 21. The intersection of academic demand, economic collapse, and war-related trauma necessitates systemic intervention 1, 4, 15.

5.2. Strategic Recommendations

- **Integration of SBIRT:** Mandatory training in the Screening, Brief Intervention, and Referral to Treatment (SBIRT) framework must be integrated into clinical rotations 41.
- **Asynchronous Digital Training:** Adoption of peer-led models like the Smoking Cessation Strategy Course (SCSC), which achieved a 78.3% retention rate despite infrastructure limits, should be expanded 13.
- **Decentralized Support Models:** Implementation of non-stigmatizing services based on the Darayya clinic model can provide community-level screening and counseling 3.
- **Student Health Services:** Universities must offer confidential mental health services that focus on reducing stigma and protecting the academic standing of students seeking help 19, 31, 37

5.3. Final Statement

Systemic reform is required to align medical education with the National Strategy on Substance Use (2026–2030) and transition from moralistic views of addiction toward a compassionate, evidence-based medical model 3, 37, 40.

Compliance with ethical standards

Disclosure of conflict of interest

The authors declare that there are no financial or non-financial conflicts of interest related to this research. This study received no external funding or commercial sponsorship that could have inappropriately influenced the findings or the writing of this manuscript

Statement of ethical approval

Ethical Approval: This study was approved by the Institutional Review Boards (IRB) and ethical licensing committees of the participating institutions All study procedures were performed in accordance with the ethical principles for medical research involving human subjects as outlined in the Declaration of Helsinki

Statement of informed consent

Participation in this study was entirely voluntary. Informed electronic consent was obtained from all 317 participants on the first page of the structured questionnaire Participants were informed about the study's objectives and were required to click "I Agree" before accessing the survey

Confidentiality and Anonymity

To protect the privacy of the students, the survey was conducted anonymously ,.No personal identifiers, such as names, student IDs, or email addresses, were collected during the data gathering process. All data were stored securely and treated with strict confidentiality

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