



# Assessing the Knowledge, Attitudes, and Practices of Al-Neelain Medical Students Regarding Crystal Methamphetamine

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## Abstract

**Background:** Substance abuse is a global crisis with over 275 million individuals using illicit drugs, leading to opioid overdoses and significant impairment. Methamphetamine, a potent and neurotoxic substance, is particularly concerning due to its high purity and ease of inhalation. Limited research exists on the patterns and factors influencing substance use among youth at risk, including those involved in the criminal justice system. Understanding the unique challenges faced by these youth is crucial for developing targeted prevention and intervention strategies.

**Methods:** A cross-sectional study at Al Neelain University, Sudan, involved 288 students. Ethical considerations were followed, and participants were informed of the study's objectives. Data was collected using a validated questionnaire, focusing on knowledge, attitudes, and practices towards methamphetamine use. The study was analyzed using SPSS version 29 and the Chi-square test.

**Results:** A study in Khartoum found that most participants, aged 20-25, were aware of crystal methamphetamine addiction. They believed medical education should focus on addressing addiction. Barriers to treatment included stigma and lack of knowledge. Successful treatment outcomes included motivation, support, and quality treatment services.

**Conclusion:** The study reveals varying attitudes among medical students towards crystal methamphetamine, highlighting the need for increased education and training in the substance's impact on health.

**Keywords:** Abuse; Addiction; Crystal Methamphetamine; Medical Students

## Abbreviations

WHO: World Health Organization and MA: Methamphetamine.

## Introduction

Substance abuse is a global crisis with devastating consequences, with the United Nations Office on Drugs

and Crime (WHO) reporting that over 275 million individuals worldwide use illicit drugs. Opioid overdose is a leading cause of death related to drug use, and substance dependence often leads to withdrawal symptoms and significant impairment [1]. Methamphetamine (MA), a highly abused psychoactive stimulant, is associated with various neurological conditions due to its potent and neurotoxic properties. The growing use of crystal methamphetamine

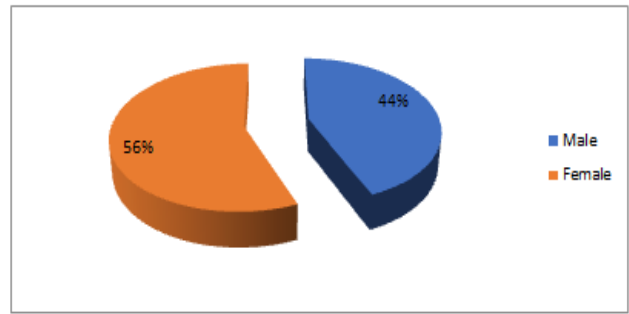
is particularly concerning due to its high purity and ease of inhalation, leading to rapid absorption and a heightened risk of dependence. Long-term use is linked to cognitive impairments, aggression, and mood swings [2]. Limited research exists on the patterns and factors influencing substance use among youth at risk for problematic use, including those involved in the criminal justice system. Future research should differentiate between various types of drug use, including methamphetamine, and consider the frequency and context of use to accurately assess its impact on juvenile offenders [3,4]. Understanding the specific needs of youth involved in the criminal justice system, including the unique challenges they face with methamphetamine use, is critical for developing targeted prevention and intervention strategies [5-7]. Sudan, like many developing countries, is facing a growing challenge with methamphetamine use, particularly among young adults. Understanding the perceptions and practices of young people, including future healthcare professionals, towards this drug is essential for improving public health and supporting individuals struggling with substance abuse.

## Methods

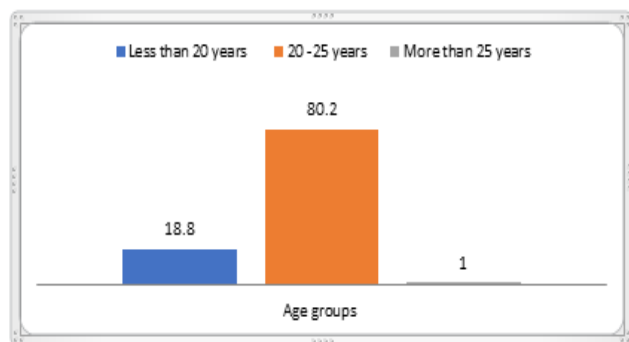
A descriptive cross-sectional institutional study was conducted at the Faculty of Medicine, Al Neelain University, Khartoum State, Sudan, between June and September 2022. This community-based study involved a sample size of 288 students. All ethical considerations were addressed throughout the study. Participants were informed of the study's objectives, and informed consent was obtained prior to their participation. Data was collected using a well-designed, validated questionnaire that underwent reliability and validity tests. Students were assured of the confidentiality of their responses, encouraging honest answers. Questionnaires were distributed anonymously for completion. The questionnaire focused on knowledge, attitudes, and practices towards methamphetamine use, including questions related to demographics, drug consumption, and addiction treatment. Researchers provided guidance to participants if they encountered any ambiguity while completing the questionnaire. After reviewing and coding the collected data, it was analyzed using SPSS version 29 and the Chi-square test.

## Results

Results of study were summarized in tables and figures bellow, with 56.3% being female and 43.8% male (Figure 1). The majority (80.2%) of participants were between the ages of 20-25, followed by those under 20 (18.8%) and over 25 (3%) (Figure 2).

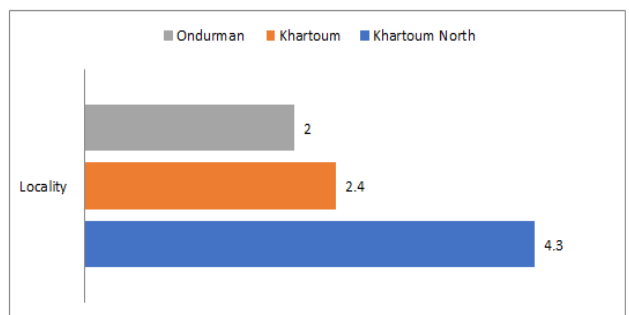


**Figure 1:** Distribution of the participant among their gender.



**Figure 2:** Distribution of the participant among their age group.

Most participants resided in Khartoum locality (58.7%), followed by Omdurman (21.2%) and Khartoum North (20.1%) (Figure 3). The vast majority (96.9%) of participants had heard of crystal methamphetamine (ice) (Table 1), with 60.8% learning about it through social media, 29.9% through friends and colleagues, 6.9% from TV, and 2.4% unaware (Table 2).



**Figure 3:** Distribution of the participant among their residence.

	Frequency	Percent	Valid Percent
No	8	2.8	2.8
Not sure	1	0.3	0.3
Yes	279	96.9	96.9
Total	288	100	100

**Table 1:** Shows if students have heard about the crystal methamphetamine before or not.

A significant proportion (87.8%) considered crystal methamphetamine addiction in the community a very serious problem, with 9.7% deeming it somewhat of a problem.

Overwhelmingly (84.7%) felt that medical education should emphasize addressing crystal methamphetamine addiction (Table 3).

	Frequency	Percent	Valid Percent
Friends/colleagues	86	29.9	29.9
I did not hear about it	7	2.4	2.4
Social media	175	60.8	60.8
TV-News	20	6.9	6.9
Total	288	100	100

**Table 2:** Shows the source from which students had first heard about the (ice).

	Frequency	Percent	Valid Percent
Not at all serious	2	0.7	0.7
Not very serious	5	1.7	1.7
Somewhat serious	28	9.7	9.7
Very serious	253	87.8	87.8
Total	288	100	100

**Table 3:** Shows the students opinions on how serious the problem of crystal methamphetamine addiction in the community.

Individuals were familiar with common short-term effects of crystal methamphetamine, including increased heart rate and blood pressure (28.3%), agitation and anxiety (22.9%), insomnia (21.8%), and decreased appetite (16.3%) (Table 4). Addiction (33.3%) was the most commonly recognized

long-term effect, followed by psychosis and hallucinations (27.9%), cognitive impairment (19.3%), tooth decay and gum disease (13.2%), and a small percentage (6.2%) unaware (Table 5).

	Frequency	Percent	Valid Percent
No	9	3.1	3.1
Not sure	35	12.2	12.2
Yes	244	84.7	84.7
Total	288	100	100

**Table 4:** Shows the percentages of students who think there should be more emphasis on addressing crystal methamphetamine addiction in medical education from the ones who think otherwise.

	Frequency	Percent	Valid Percent
Agitation and anxiety	145	22.9	22.9
Decreased appetite	103	16.3	16.3
I do not know	67	10.6	10.6
Increased heart rate and blood pressure	179	28.3	28.3
Insomnia	138	21.8	21.8
Total		100	100

**Table 5:** Shows the frequencies for each answer regarding the question (what are the short-term effects of crystal methamphetamine use) n = 288.

When it came to barriers to seeking treatment, 25.3% cited stigma, 24.4% feared legal consequences, 22.1%

lacked access to treatment services, and others cited lack of knowledge or believed the addiction untreatable (Table 6).

	Frequency	Percent	Valid Percent
Addiction	224	33.3	33.3
Cognitive impairment	130	19.3	19.3
I do not know	42	6.2	6.2
Psychosis and hallucinations	188	27.9	27.9
Tooth decay and gum disease	89	13.2	13.2
Total		100	100

**Table 6:** Shows the frequencies for each answer regarding the question (what are the long-term effects of crystal methamphetamine use) n = 288.

Regarding successful treatment outcomes, participants emphasized motivation and willingness to change (25.8%), support from family and friends (25%), access to quality

treatment services (22.7%), and addressing underlying mental health issues (18.7%) (Table 7).

	Frequency	Percent	Valid Percent
Cost of treatment	148	19.8	19.8
Fear of legal consequences	182	24.4	24.4
I do not know	49	6.6	6.6
It is not treatable	13	1.7	1.7
Lack of access to treatment services	165	22.1	22.1
Stigma associated with the addiction	189	25.3	25.3
Total		100	100

**Table 7:** Shows the frequencies for each answer regarding the question (what barriers do you think exist for patients seeking treatment for the addiction) n = 288.

The most effective treatments were seen as a combination of behavioral therapy and medication-assisted treatment (25%), followed by support groups (21.3%), residential treatment programs (20.5%), with a small percentage unsure or believing the addiction untreatable (Table 8).

Participants believed public education campaigns (34.8%), media coverage and news stories (34.4%), and community outreach and events (30.9%) were the most effective ways to raise awareness of crystal methamphetamine addiction (Table 9).

	Frequency	Percent	Valid Percent
Access to quality treatment services	182	22.7	22.7
Addressing underlying mental health issues	150	18.7	18.7
I do not know	50	6.2	6.2
I do not think that it is treatable	12	1.5	1.5
Motivation and willingness to change	207	25.8	25.8
Support from family and friends	200	25	25
Total		100	100

**Table 8:** Shows the frequencies for each answer regarding the question (what factors do you think contribute to successful treatment outcomes for the addiction) n = 288.

	Frequency	Percent	Valid Percent
Behavioral therapy	195	25	25
I do not know	52	6.7	6.7
I do not think that it is treatable	12	1.5	1.5
Medication assisted treatment	195	25	25
Residential treatment programs	160	20.5	20.5
Support groups	166	21.3	21.3
Total		100	100

**Table 9:** Shows the frequencies for each answer regarding the question (what are the most effective treatments for crystal methamphetamine addiction in your opinion) n = 288.

Medical professionals were seen as crucial in addressing the issue, primarily through providing education and resources (37.7%) and collaborating with community organizations

and treatment services (32.3%). providers 31.1% then Advocating for policies that support addiction treatment and prevention 30.3% (Table 10,11).

	Frequency	Percent	Valid Percent
Community outreach and events	222	30.9	30.9
Media coverage and news stories	247	34.4	34.4
Public education campaigns	250	34.8	34.8
Total		100	100

**Table 10:** Shows the frequencies for each answer regarding the question (what do you think can be done to raise awareness about the seriousness of crystal methamphetamine (ice) addiction in the community n = 288.

	Frequency	Percent	Valid Percent
Advocating for polices that support addiction treatment and prevention	3	0.5	0.5
Advocating for policies that support addiction treatment and prevention	204	30.8	30.8
Collaborating with community organizations and treatment providers	206	31.1	31.1
Providing education and resources to patients and families	250	37.7	37.7
Total	663	100	100

**Table 11:** shows the frequencies for each answer regarding the question (how do you think medical professionals can play a role in addressing the issue of crystal methamphetamine addiction in the community.

## Discussion

Crystal methamphetamine commonly referred to as (ice) is a highly addictive substance drug that affects the central nervous system causing severe physiological and psychological consequences.

Our research aimed to determine the level of knowledge of medical students about the effects of the drug including assessing their beliefs on the treatability of its addiction and identifying the factors affecting their level of knowledge and attitudes towards the drug usage, while exploring their perception on the seriousness of crystal methamphetamine as a problem in the community.

A total of 288 individuals completed the study questionnaire, with 56.3% identified as females and 43.8% as males, with the majority of the participants (80.2%) belonged to the age group of 20-25 years. The vast majority of participants (96.9%) reported having heard about crystal methamphetamine with the majority of them (60%) having heard about it from social media. The data suggested that the participants showed average to good knowledge about the effects of crystal methamphetamine with almost most of them showing negative attitude towards the drug usage.

The results of this study align with existing literature that suggests a high level of awareness of crystal methamphetamine among medical students, as in a study reported by Han et al [4] that aimed to determine the level of awareness among Southeast public in the abuse of methamphetamine hydrochloride drugs, the results revealed that the majority of the respondents have heard, watched and read about the Methamphetamine hydrochloride drug. And in contrast to our study, a study among Iranian students which found their lack of knowledge and awareness due to lack of comprehensive and mandatory course in educational system [8,9]. But our data suggested that 77.8% of our participants didn't receive any education or training on crystal methamphetamine during their medical studies despite the good level of awareness and knowledge among them, which highlights the importance of social media as about 60.8% of the participants obtained their information from social media. This note was similar to the finding aligned with Noori and their colleague (2016) that mass media functions are crucial and if effectively deployed, they can help the various anti-drug agencies in Nigeria to fight the problem of drug abuse and trafficking [10]. The prevalence of social media as a primary source of information on the drug highlights the need for targeted prevention and education efforts through these platforms. This finding underscores the importance of utilizing social media as a tool for disseminating accurate information and raising awareness about the dangers associated with crystal methamphetamine.

The study revealed that the participants displayed average to good knowledge about the effects of crystal methamphetamine and also the treatability. Specific effects discussed included physical health consequences, mental health impacts, and social implications. The findings aligned with Shohani et al that reported an average level of knowledge among medical students, and an acceptable level of knowledge among undergraduate students [11]. These findings emphasize the critical role of education and awareness programs in equipping young adults with the necessary knowledge to make informed decisions about drug use. By enhancing understanding of the risks associated with crystal methamphetamine, individuals may be more inclined to avoid experimentation or seek help if needed.

Participants exhibited predominantly negative attitudes towards crystal methamphetamine use. Factors influencing these attitudes included perceptions of harm, personal values, and social influences. In contrast to the results reported by Fallah et al suggesting that students from the faculties of health and medicine were holding more positive attitudes towards stimulants than other students [12] which may stem from the association between factors such as recreation, curiosity, peer pressure, increased concentration and energy linked to these stimulants tried by the students. These findings suggest that interventions aimed at shifting attitudes towards drug use should focus on highlighting the negative consequences and promoting healthier alternatives. By addressing underlying beliefs and attitudes, prevention strategies can effectively deter individuals from engaging in risky behaviors involving crystal methamphetamine.

Looking close into a study that has shown that the rise in drug use disorders contributes to shattered families, crime, violence, insecurity, and health problems like HIV and hepatitis C from injecting drugs. Economic burdens were also evident, particularly in low- and middle-income countries as reported by Mohebbi, et al [8]. We saw that the vast majority of our students reported that CM addiction is a very serious problem in the community and that efforts must be done to raise the awareness about the seriousness of crystal methamphetamine addiction in the community and in the medical education. This is a positive finding as it indicates that these future healthcare professionals have a solid understanding of the potential risks associated with this drug.

## Conclusion

This study offers valuable insights into the knowledge and attitudes of medical students regarding crystal methamphetamine, revealing some gaps in understanding its impact on health. Despite awareness, students have varying

attitudes towards the substance, with some stigmatizing it and others recognizing its importance in patient care. This highlights the need for increased education and training in medical education.

## Study Limitations

### Sampling and Generalizability

- **Limited Sample Size:** The study may have a limited sample size, which may not be representative of the entire student population at Al-Neelain University. This could limit the generalizability of the findings.
- **Self-Selection Bias:** Participants who volunteered for the study might have different attitudes and practices towards crystal methamphetamine than those who did not, potentially introducing bias.
- **Limited Geographic Scope:** The study is focused only on Al-Neelain University, which might not represent the broader population of medical students in Sudan or other contexts.

### Data Collection Methods

- **Survey Bias:** Survey questions may be interpreted differently by different individuals, potentially introducing bias in the responses.
- **Social Desirability Bias:** Participants might provide answers they believe are socially acceptable rather than their true opinions, particularly on sensitive topics.

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