

## Route of Drug Abuse and Its Impact on Oral Health-Related Quality of Life among Drug Addicts

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### Original Article

#### Abstract

**Background:** Various studies have tested quality of life (QOL) among drug addicts, however very few have reported any association between oral health-related quality of life (OHRQOL) and mode of drug administration among drug addicts. Hence, the present study was conducted aiming to evaluate the impact of mode of administration of drugs on OHRQOL among drug addicts.

**Methods:** Data was collected using respondent-driven sampling (RDS) method among 313 male drug addicts in Sri Ganganagar, Rajasthan, India, using self-administered questionnaires on oral hygiene aids and drug addiction history. OHRQOL was recorded using Oral Health Impact Profile (OHIP-14) questionnaire. The chi-square test, t-test, and Kruskal-Wallis test were used for statistical analysis.

**Findings:** In this study, 56.2% of the drug addicts reported practicing oral hygiene aids. The main drugs abused were heroin, cocaine, and amphetamines as 51.4%, 35.1%, and 13.4%, respectively. Most of the drug addicts were employed (82.4%) and studied up to primary education (46.3%). The highest mean values of community periodontal index (CPI) and decayed, missing, filled surface (DMFS) were found among the cocaine addicts and amphetamine abusers with rates of  $3.11 \pm 0.98$  and  $6.69 \pm 8.52$ , respectively. Poor OHRQOL was observed among addicts who consumed drugs in inhalation since a long time irrespective of the type of the drug, but among them heroin addicted subjects had the poorest OHRQOL.

**Conclusion:** OHRQOL was poor among the drug addicts in comparison to general population. Preventive strategies on oral health and other health promotion programs for this vulnerable group can be unified.

**Keywords:** Drug users; Route of drug; Oral health; Quality of life

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## Introduction

Drug addiction is a prolonged, deteriorating disorder characterized by compulsion to take a drug and lack of self-control in limiting drug intake. It is defined as physical and psychological dependence on psychotic substances (e.g., alcohol, tobacco, heroine, etc.). These substances, when cross the blood-brain barrier on ingestion, temporarily alter the chemical milieu of the brain.<sup>1</sup> These substances or drugs may be natural or synthetic, the use of which has a psychoactive effect and amends or alters the functions of a living organism. These drugs can be consumed either by inhalation, injection, or by ingestion. Globally, the numbers of drug addicts in 2013 were 246 million<sup>2</sup> among whom 11.35 million lived in India.<sup>3</sup> Alcohol, cannabis, and raw opium consumption has been traditionally accepted in India, however an increase in methamphetamines use has been reported recently in some regions of South East Asia.<sup>2</sup>

Consistent drug use results in social or economic burden is often associated with medical as well as oral health problems. Drug addiction is along with both direct and indirect concerns for oral health and can exaggerate oral problems indirectly through its hostile effects on the users' behavior as well as life style. Oral health diseases are greatly associated with drug misuse as oral tissues are directly exposed to them during the drug consumption. This can be understood as drug's biologic interaction with normal functioning of oral cavity.

It is a well-known fact that oral diseases impact the quality of life (QOL). QOL is a multidimensional concept with interrelated domains such as social, physical, psychological, and living environments. Similarly, oral health may impact a person functionally, psychologically, and socially in addition to causing pain and discomfort. Oral health has a demonstrable effect on QOL, despite the fact that psychological and social aspects of a person's life are not habitually associated with their oral health status.

There are various studies like the ones conducted by Maremmani et al.<sup>4</sup> and De Maeyer et al.<sup>5</sup> on examining QOL among drug addicts, but to the best of our knowledge, very few studies have reported the association between OHRQOL and mode of administration among drug addicts

until now. The results will definitely be of great importance in definition, allocation, and prioritization of resources towards this vulnerable population. Therefore, measuring OHRQOL along with the mode of consumption of these drugs should definitely provide insight towards the association of these unaddressed factors with oral health status among this group.

## Methods

The study group consisted of 324 male drug addicts examined over a period of 6 months from October 2015 to March 2016. All the subjects in the study used their desired drug at least twice a week in the same mode of administration and should had features of forbearance and continued use despite social, economic, and medical problems. The drug addicts who misused more than one drug and occasional users were excluded from the study. The data of the participants was kept confidential and anonymous. 11 participants refused to give informed consent so the final sample included 313 participants. The study was sanctioned by the ethical committee of Surendera Dental College and Research Institute, Sri Ganganagar, Rajasthan, India.

Respondent-driven sampling (RDS) was used to gather a sample of drug addicts. Such a sampling technique was administered to reach unseen populations. The method accounted for non-random selection of initial respondents. In all de-addiction centers, 4 initial respondents were selected. Those respondents were the first "flow" of participants, who recruited the second. The number of surfs was five in order to reduce selection bias and to reach deeper into the population of drug addicts and provide generalizability of the results. Respondents were allowed to enroll a maximum of three new participants. This technique allowed the recruitment of active addicts and was not similar to other studies drawing the data from institutionalized settings where the HRQOL is definitely affected and the recruits are not actually addicts but rather being affected by withdrawal symptoms.

The data was recorded through face-to-face interviews using a self-prepared questionnaire which included questions regarding socio-demographic factors, oral hygiene practices (brushing material; mode; frequency), history of

alcohol use, smoking, and detailed history of drug (heroin, cocaine, and amphetamines) consumption. The questionnaire was piloted on a group of 15 addicts, and few adjustments were made in the instrument before its application. The clinical examination was done by a single calibrated examiner for whom kappa statistic was determined 0.8, 2 days prior to study.

A standard instrument was needed in order to evaluate the impact of oral health problems on OHRQOL among drug addicts. The Indian version of the Oral Health Impact Profile (OHIP-14)<sup>6</sup> proposed by Deshpande and Nawathe was the best among the questionnaires to evaluate OHRQOL among the adult populations as it represented both an individual as well as a group of individuals, while measuring the extent with which poor oral health could affect daily life. The period of interview and examination lasted for 20 minutes.

The community periodontal index (CPI) and decayed, missing, filled surface (DMFS) indexes were recorded to evaluate the periodontal status and caries prevalence among the drug addicts respectively according to the criteria proposed by the World Health Organization (WHO).<sup>7</sup> WHO type III examination was carried using the WHO probe natural light, mouth mirror, and explorer

whereas patients were seated on ordinary chairs.

The SPSS software (version 20, IBM Corporation, Armonk, NY, USA) was used for the statistical analysis. The statistical significance was determined by the chi-square test, unpaired t-test, and Kruskal-Wallis test with level of significance set at  $P < 0.05$ .

### Results

In the present study, most of the drug addicts were in 25-34 year age group. The main drugs of misuse were heroin (n = 161), cocaine (n = 110), and amphetamines (n = 42), and the duration of addiction was more than five years in almost half of the drug addicts. Most of the drug addicts were employed (n = 258). Almost half of the drug addicts had undergone primary education (n = 145) and oral hygiene practices were seen in more than half (n = 176) of the drug addicts (Table 1).

The most affected domain of OHRQOL was social disability followed by psychological disability and the least affected domain was physical disability reported among addicted population. People consuming drugs in inhalation form reported higher impact towards social disability domain of OHRQOL (Table 2).

**Table 1.** Characteristics of addicts

Variable	Heroin (n = 161)		Cocaine (n = 110)		Amphetamines (n = 42)		P*
	Injected	Inhaled	Injected	Inhaled	Injected	Inhaled	
Age (year)							0.02
18-24	14	27	11	21	2	8	
25-34	22	41	10	29	5	9	
35-44	7	32	5	23	1	3	
45-54	4	14	3	8	2	12	
Education status							0.01
No education	3	13	0	3	0	3	
Primary	13	55	4	56	1	16	
Secondary	20	19	13	17	1	2	
College/Faculty	11	27	12	5	8	11	
Employment status							0.07
Employed	39	85	28	68	10	28	
Unemployed	8	29	1	13	0	4	
Duration of addiction							0.01
< 5 years	14	54	13	49	4	21	
≥ 5 years	33	60	16	32	6	11	
Oral hygiene practices							0.06
Yes	11	78	6	62	1	18	
No	36	36	23	19	9	14	

\*P value based on chi-square test

**Table 2.** Oral health-related quality of life (OHRQOL) of drug addicts according to type and mode of consumption

Questions	Heroin		Cocaine		Amphetamines							
	Injected	Inhaled	Injected	Inhaled	Injected	Inhaled						
Possible outcomes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Functional limitations												
1. Trouble pronouncing words	39	8	93	21	23	6	70	11	6	4	29	3
2. Worse taste	44	3	88	26	27	2	60	21	9	1	24	8
OHRQOL ≥ 2	n = 52		n = 33		n = 15							
P			0.79									
Physical pain												
3. Painful aches	22	25	82	32	18	11	59	22	4	6	26	6
4. Uncomfortable eating food	43	4	65	49	25	4	40	41	9	1	23	9
OHRQOL ≥ 2	n = 79		n = 64		n = 16							
P			< 0.01									
Psychological discomfort												
5. Self-conscious	38	9	76	38	24	5	40	41	9	1	21	11
6. Tense feeling	41	6	61	53	24	5	33	48	8	2	24	8
OHRQOL ≥ 2	n = 101		n = 88		n = 19							
P			< 0.01									
Physical disability												
7. Unsatisfactory diet	45	2	89	25	26	3	63	18	8	2	23	9
8. Interruption of meals	46	1	95	19	28	1	69	12	9	1	25	7
OHRQOL ≥ 2	n = 44		n = 28		n = 14							
P			0.62									
Psychological disability												
9. Difficult to relax	23	24	63	51	16	13	43	38	6	4	20	12
10. Feeling embarrassed	28	19	58	56	22	7	35	46	8	2	19	13
OHRQOL ≥ 2	n = 128		n = 82		n = 15							
P			< 0.01									
Social disability												
11. Been a bit irritable	30	17	51	63	18	11	29	52	7	3	15	17
12. Difficulty doing usual jobs	19	28	65	49	17	12	38	43	4	6	19	13
OHRQOL ≥ 2	n = 131		n = 99		n = 32							
P			0.06									
Handicap												
13. Life, less satisfying	39	8	80	34	24	5	54	27	8	2	25	7
14. Totally unable to function	20	27	70	44	14	15	50	31	5	5	23	9
OHRQOL ≥ 2	n = 87		n = 60		n = 18							
P			0.39									

OHRQOL: Oral health-related quality of life

Table 3 shows the OHRQOL of drug addicts according to type and duration of addiction. As the duration of addiction of these drugs increased, the OHRQOL also deteriorated.

Table 4 shows oral health status of drug addicts according to type, mode of administration, and duration of addiction of drugs. The highest and lowest mean CPI scores were obtained for cocaine and amphetamine drug addicts, respectively. In addition, the highest and lowest mean decayed surfaces were obtained respectively among amphetamines and cocaine drug addicts. The remarkable outcome of the study was that those who consumed drugs and

advocated oral hygiene practices had better oral health status in comparison to those who consumed drugs and were not advocating oral hygiene practices. Comparatively, mean score for CPI and decayed surfaces was more in individuals who injected these drugs than those who inhaled them. Mean difference score for CPI was found more in individuals who brushed and those who didn't brush among the subjects in the inhalation category when compared with injection category subjects. There was significant relationship between the type of drug, mode of administration, and duration of addiction with CPI and mean decayed surfaces.

**Table 3.** Oral health-related quality of life (OHRQOL) of drug addicts according to type and duration of addiction

Questions	Heroin				Cocaine				Amphetamines			
	< 5 years		≥ 5 years		< 5 years		≥ 5 years		< 5 years		≥ 5 years	
Possible outcomes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Functional limitations												
1. Trouble pronouncing words	57	11	75	18	55	7	38	10	23	2	12	5
2. Worse taste	61	7	71	22	54	8	33	15	22	3	11	6
Physical pain												
3. Severe pains	56	12	67	26	56	6	29	19	22	3	12	5
4. Uncomfortable eating food	52	16	56	37	48	14	17	31	23	2	9	8
Psychological discomfort												
5. Self-conscious	60	8	54	39	49	13	15	33	21	4	9	8
6. Tense feeling	50	18	52	41	48	14	9	39	22	3	10	7
Physical disability												
7. Unsatisfactory diet	62	6	72	21	57	5	32	16	22	3	9	8
8. Interruption of meals	66	2	75	18	56	6	42	6	23	2	11	6
Psychological disability												
9. Difficult to relax	44	24	45	48	50	12	13	35	20	5	6	11
10. Feeling embarrassed	37	31	49	44	45	17	12	36	19	6	8	9
Social disability												
11. Been a bit irritable	46	22	35	58	44	18	3	45	19	6	3	14
12. Difficulty doing usual jobs	57	11	43	50	58	10	7	41	17	8	8	9
Handicap												
13. Life, less satisfying	57	11	62	31	60	8	24	24	24	1	9	8
14. Totally unable to function	49	19	59	34	61	7	20	28	24	1	8	9

**Discussion**

This study was an attempt to evaluate the impact of mode of consumption of drugs on the oral health related QOL among drug addicts. Most of the participants (37%) were in 25-34 year age group, which was similar to various studies including the studies performed by Shekarchizadeh et al.<sup>8</sup> and Ray and Chopra.<sup>9</sup> Other studies were also concerned with the similar age group for drug dependency.<sup>10,11</sup>

According to the studies, the cause for this age pattern could be due to the fact that at this age, individuals are perceived as adults and become monetarily liberated.

Most of the participants had undergone primary education (46.3%) and were employed (82.4%), which was in contrast with the study by Supic et al.<sup>12</sup> This variation in results could be due the fact that the participants were less educated and belonged to labor class; working on daily wages hence can be considered as employed.

**Table 4.** Oral health status according to drug, mode, and duration of addiction

Variables	CPI (mean ± SD)		Decayed surfaces (mean ± SD)	
	Without brushing	With brushing	Without brushing	With brushing
Drug				
Heroin	2.37 ± 0.84*	1.92 ± 0.76*	4.32 ± 5.71*	3.12 ± 1.86*
Cocaine	3.11 ± 0.98**	2.69 ± 0.79**	4.03 ± 5.06*	2.82 ± 1.36
Amphetamines	1.97 ± 0.71#	1.22 ± 0.62#	6.69 ± 8.52**	4.24 ± 2.41**
P (Kruskal -Wallis test)	< 0.01	< 0.01	< 0.01	< 0.01
Mode of administration				
Injected	2.94 ± 0.91	2.48 ± 0.81	5.69 ± 5.23	3.94 ± 2.13
Inhaled	2.02 ± 0.73	1.40 ± 0.64	4.33 ± 4.71	2.74 ± 1.96
P (t-test)	0.02	< 0.01	< 0.01	< 0.01
Duration of addiction				
< 5 years	1.81 ± 0.68	1.11 ± 0.58	3.97 ± 4.06	4.87 ± 3.12
≥ 5 years	3.15 ± 1.21	2.77 ± 1.14	7.05 ± 8.89	1.91 ± 1.28
P (t-test)	< 0.01	< 0.01	< 0.01	< 0.01

SD: Standard deviation; CPI: Community periodontal index  
Different symbols indicate statistical significance.

This kind of employment pattern was pretty common in this part of the country where people were working more as laborers to meet their daily needs. This physically tedious work drives them to consume alcohol, tobacco, and various illicit drugs relieving their stress and deteriorating their oral health.<sup>13-15</sup>

The outcome of the current study reveals that the subjects practicing oral hygiene were more in number as compared to the addicts practicing irregular/no oral hygiene practices; this was similar to the previous studies.<sup>8,12</sup> This distribution could be due to easy availability of oral hygiene aids nowadays.

The OHRQOL was worsened more among those drug addicts who consumed drugs for more than five years in the present study. Similarly, Shekarchizadeh et al.<sup>8</sup> reported that the drug addicts' OHRQOL was worsened as the duration of practicing illicit drugs increased.

The findings of the study reports that the most exaggerated domain was social disability which was dissimilar with the study carried out on general population in which the most commonly reported impacts was seen within the domains of physical disability<sup>16</sup> and physical pain.<sup>17</sup> The least affected domain in the present study was physical disability whereas in other studies, the it was handicap<sup>16</sup> and functional limitation.<sup>17</sup> The high reporting of social disability domain among the study population could be due to the fact that the drug addict population is usually isolated from the general population, especially their family and tendency to report irritable episodes. Drug use is a response to social breakdown which offers users a mirage of escape from adversity and stress, but only makes their problems worse. People turn to drugs to numb the pain of harsh economic and social conditions, which in turn leads to downward social mobility.

The overall oral health status of the drug addicts seems to be in poor state as it can be clearly appreciated from the results of the mean CPI and DMFS scores among drug addicts who brushed and those who did not brush were 1.94, 3.39 and 2.48, 5.01, respectively. It had been well documented in the studies by Brand et al.<sup>18</sup> and Van Zyl<sup>19</sup> that among cocaine addicts, the gingivae are being coated with white slough, which when removed show sign of inflammation and erythema. The outcomes of the present study

are in accordance with above mentioned studies and present high CPI scores among cocaine users. These complications on periodontal health were related to strong vasoconstriction properties of cocaine. In addition, gingival laceration may be aggravated among drug users due to excessively vigorous tooth brushing during high period. This reason was being supported by Saini et al.<sup>1</sup> and Brand et al.<sup>18</sup> Moreover, inflammation at the site of repeated injections may also lead to limited motor activity leading to poor oral hygiene skills among injection drug users.

Studies done by Saini et al.<sup>1</sup> and Robinson et al.<sup>20</sup> reported high caries experience among heroin drug addicts, whereas results of the present study indicated predominance of caries experience among amphetamines drug users. This high caries experience must be due to the Xerostomia caused by the use of opiates<sup>1,20</sup> and amphetamines.<sup>1,19,21</sup>

The present study was a pioneer attempt to check the OHRQOL in relation to mode of administration and its effect on oral health status among drug addicts who had not been tested before; hence the comparison with other studies could not be made. According to authors, the results could have been appreciated better in a longitudinal design. Hence, new study with longitudinal design must be conducted to test the effect of mode of consumption on oral health and its QOL.

## Conclusion

This study brings new information from a public health perspective. Predictably, the periodontal and dental caries status of this population was measured to be significantly higher than the general population and the OHRQOL was deprived. Moreover, this type of study is relevant to planning of public health programs, and may contribute to the definition of groups with higher levels of need. Rather than cutting access to care among this vulnerable population, more effective public health policy would be instigated to increase preventive and treatment services.

## Conflict of Interests

The Authors have no conflict of interest.

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## مسیر سوء مصرف مواد و تأثیر آن بر کیفیت زندگی مرتبط با سلامت دهان در معتادان به مواد مخدر

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### مقاله پژوهشی

### چکیده

**مقدمه:** مطالعات مختلف، کیفیت زندگی (Quality of life یا QOL) را در معتادان مواد مخدر مورد بررسی قرار دادند، اما تعداد کمی از آنها هرگونه ارتباط بین کیفیت زندگی مرتبط با سلامت دهان (Oral health-related quality of life یا OHRQOL) و نحوه مصرف دارو را در معتادان مواد مخدر گزارش کرده‌اند. بنابراین، پژوهش حاضر با هدف ارزیابی تأثیر روش مصرف دارو بر میزان OHRQOL در بین بیماران مبتلا به دیابت انجام شد.

**روش‌ها:** داده‌ها با استفاده از روش نمونه‌گیری پاسخگو محور از ۳۱۳ مرد معتاد مواد مخدر در شهر سرگنگانگار راجستان با استفاده از پرسش‌نامه‌های خودایفا در مورد مراقبت‌های دهان و دندان و اعتیاد جمع‌آوری گردید. OHRQOL با استفاده از پرسش‌نامه Oral Health Impact Profile (OHIP-14) ثبت شد. داده‌ها با استفاده از آزمون‌های  $\chi^2$ ، t و Kruskal-Wallis مورد تجزیه و تحلیل قرار گرفت.

**یافته‌ها:** ۵۶/۲ درصد از معتادان به مواد مخدر انجام مراقبت‌های دهان و دندان را گزارش کردند. مواد مخدر اصلی مورد مصرف شامل هروئین (۵۱/۴ درصد)، کوکائین (۳۵/۱ درصد) و آمفتامین (۱۳/۴ درصد) بود. بیشتر معتادان به مواد مخدر (۸۲/۴ درصد) شاغل بودند و تحصیلات ابتدایی (۴۶/۳ درصد) داشتند. میانگین شاخص پرپودنتال جامعه (Community periodontal index یا CPI) و Decayed, missing, filled surface (DMFS) در گروه معتادان به کوکائین ( $0.98 \pm 0.31$ ) و سوء مصرف‌کنندگان آمفتامین ( $8.52 \pm 6.69$ ) بیشترین مقدار را داشت. سطح پایین OHRQOL در میان معتادانی مشاهده شد که به مدت طولانی مواد را به صورت استنشاقی مصرف کرده بودند و در میان آن‌ها افراد معتاد به هروئین دارای ضعیف‌ترین OHRQOL بودند.

**نتیجه‌گیری:** OHRQOL در معتادان به مواد مخدر در مقایسه با مردم عادی از سطح پایینی برخوردار است. استراتژی‌های پیشگیرانه در زمینه بهداشت دهان و دندان و دیگر برنامه‌های ترفیع سلامت در این گروه آسیب‌پذیر می‌تواند تجمیع شود.

**واژگان کلیدی:** سوء مصرف‌کنندگان مواد، مسیر دارو، سلامت دهان، کیفیت زندگی

**ارجاع:** شارما آدیتی، سینگ سیمارپریت، ماتور آنمول، آگاروال ویکرام پال، گوپتا نها، ماکار دیلجوت کور، باترا مانو، گیجوانی دیکشا. **مسیر سوء مصرف مواد و تأثیر آن بر کیفیت زندگی مرتبط با سلامت دهان در معتادان به مواد مخدر.** مجله اعتیاد و سلامت ۱۳۹۷؛ ۱۰ (۳): ۱۴۸-۱۵۵.

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