ORIGINAL ARTICLE

# Descriptive epidemiology and high risk behavior of male prescription opioid abusers: Cross-sectional study from Sikkim, North East India

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## ABSTRACT

**Background:** Sikkim is emerging as an important area for prescription opioid abuse with frequent news of seizures and arrests due to possession of prescription opioids. However, till date there is a little information on descriptive epidemiology and high risk behavior of prescription opioid abusers from Sikkim.

**Aims:** The aim was to describe demographic (age, sex, religion, marital status, community, occupation, etc.); socioeconomic (income, education, family information etc.); and high risk behavior (e.g., injection sharing, visit to commercial sex workers [CSWs], homosexuality etc.) among treatment-seeking prescription opioid abusers in Sikkim.

**Materials and Methods:** Epidemiological data were collected by administering predevised questionnaires from $n = 223$ prescription opioid abusers (main problem prescription opioids) reporting for treatment at five different drug abuse treatment centers across Sikkim.

**Results:** The mean age of prescription opioid abusers in Sikkim was 27 years; all were male, of Nepalese ethnicity and single/never married, school dropout and/or illiterate, earning <Rs. 10,000/month with most spending almost Rs. 5000 a month on prescription opioids. Most (57.4%) prescription opioid abusers belonged to the urban community. Commonly abused prescription opioids were dextropropoxyphene and codeine. Injection sharing was more in urban areas whereas syringe exchange was observed equally among rural and urban prescription opioid abusers. Among urban injectors visits to CSWs, and multiple sex partners were also common in spite of knowledge about AIDS. Limited condom use was observed among rural respondents. Incidences of arrests, public intoxication, and violence under the influence of prescription opioids were also reported.

**Conclusion:** Both the rural and urban areas of Sikkim show increasing rates of prescription opioid abuse among males. It is more prevalent among school dropouts and unemployed youth. Trends of injection drug use, unsafe injection, high risk behavior have also been observed.

**Key words:** High risk behavior, injection drug use, prescription opioid, Sikkim, substance abuse

## INTRODUCTION

Sikkim, a small mountainous state in the Eastern Himalayas, observed great changes in its political and social structure; economic life; and cultural values during the past 100 years. The state borders Nepal to the West, China's Tibet Autonomous Region to the North and East, and Bhutan to the Southeast. The Indian state of West Bengal lies to the south. Sikkim with a population of 6.11 lakh[1] is a multi-ethnic state, inhabited by an ethnic population of Lepchas,

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Bhutias and Nepalis. Lepchas are traditional inhabitants of Sikkim, whereas Bhutias and Nepalis (approximately 70% of Sikkim's population) have migrated from Tibet and Nepal, respectively. Sikkim was annexed to India as its 22nd state in 1975. As a result, a lot of migration took place from other parts of India, with the introduction of new substances of abuse including prescription opioids.

Prescription opioids are drugs that are prescribed for the management of pain mainly chronic noncancer pain. Prescription opioids are believed to be safer than illicit drugs of abuse and are also more easily available than illicit opioids like heroin. This has resulted in increases in the incidence of abuse of prescription opioids. While substantial epidemiological information on prescription opioid abuse is available globally and from India, such information is still not available from the state of Sikkim. National Household Survey on Drug and Alcohol Abuse, Government of India, observed the prevalence of opioid abuse of 0.7% after alcohol (21.4%) and cannabis (3%) among adult males.[2] North Eastern India, particularly states of Manipur and Nagaland are known for problems of opioid abuse, mainly due to their proximity to the "Golden Triangle" – Myanmar, Thailand, and Cambodia.[3] A cross-sectional study among 200 injecting drug users (IDUs) in Imphal, Manipur, and Dimapur, Nagaland indicated that the primary drug of abuse was injection dextropropoxyphene (spasmo proxyvon) (65.5%), followed by heroin (30.5%).[4]

In this context, it is necessary to study the pattern of prescription opioid abuse in Sikkim, another state in North Eastern India, with no information on this emerging public health problem. Therefore, the present study was carried out to describe the characteristics of treatment-seeking prescription opioid abusers in Sikkim.

## MATERIALS AND METHODS

### Setting

A cross-sectional, target population based study was conducted during the period of 2010–2013 among prescription opioid abusers who reported for treatment at five different substance abuse treatment centers located at different parts of Sikkim. $n = 224$ subjects with clinically diagnosed prescription opioid abuse as the main problem participated in the study. Subjects were recruited from Sikkim Rehabilitation and Detoxification Society (SRDS), located at Nimtar, East Sikkim; Integrated Rehabilitation Centre for Addicts (Jagriti), Sichey, Gangtok, East Sikkim; Hope Rehabilitation Centre; and Sanjeevani Rehabilitation Centre, both located at Namchi, West Sikkim; and Serenity Home, Burtuk, East Sikkim. All treatment centers are nonprofit organizations and registered under Government of Sikkim. These are residential treatment centers and affiliated with private and government hospitals for providing ancillary treatment to their patients. Duration of residential treatment varies from center to center (120–144 days). Among these treatment centers, SRDS, Nimtar provides the longest residential treatment. Detoxification schedule also varies among the treatment centers (25–30 days). Treatment-seeking drug abusers take admission to treatment centers through various drop-in centers located in rural, as well as in urban areas of Sikkim.

### Selection of subjects

Subjects of either sex and of any age who were admitted for treatment of clinically diagnosed prescription opioid abuse as the main problem at treatment centers in Sikkim were included in this study. Those who had a history of abuse of only alcohol and/or only illicit opioids and/or any other drug were excluded.

### Study design

Before enrolling for this study, informed consent was explained and signed from each participant from all the five treatment centers of Sikkim. Participation for this study was voluntary. At any time, the participant has complete freedom to withdraw from this study if desired. Full confidentiality of personal details of each participant was maintained. Predevised questionnaires were then administered to prescription opioid abusers of respective treatment centers. All instruments were administered to a participant in a single session following completion of informed consent procedure. All participants were interviewed by the same interviewer; thus excluding the possibility of inter-rater error.

### Instruments

- Generic questionnaire on the sociodemographic profile recorded information on religion, ethnicity, age, gender, marital status, average monthly income, average monthly expenditure on drugs, the level of education, occupation, etc., from each participant. Job-related information was collected according to Hollingshead categories, which divides occupation into nine different levels
- Risk Behavior Survey[5] collected information on high risk behavior profile, that is, IDU pattern, injection sharing, frequency of sexual activity, condom use characteristics, visit to commercial sex workers (CSWs), history of homosexuality etc
- Addiction Severity Index Lite (ASI-Lite), a shortened version of ASI, 5th edition,[6,7] was administered to gather information on seven domains of a patient's life: Medical, employment/support, drug and alcohol use, legal, family, social relationship, and psychiatric problems
- Abbreviated Brief Pain Inventory[8] collected information on pain status at this current time period and how much relief has pain treatments or medication provided
- The CAGE, a four-item questionnaire developed to detect alcohol problems, deliverable at the primary care level with a score of 2 or more signifying alcohol problems.[9] CAGE is a self-report tool with whose acronym is formed by the four questions relating to

alcohol use on the scale: Cutting down ("Have you ever felt you needed to cut down on your drinking?"), Annoyance at criticism ("Have people annoyed you by criticizing your drinking?"), Guilt ("Have you ever felt guilty about drinking?") and need for an Eye-opener ("Have you ever felt you needed a drink first thing in the morning to steady your nerves to get rid of a hangover?"). Fagerstrom Test for Nicotine Dependence, a six-item questionnaire assessed the[10] pattern and severity of tobacco use among prescription opioid abusers

- Short Form 36 (SF-36), quality of life questionnaire, an 11-item standardized instrument for assessment of the quality of life in physical and psychological domains. The SF-36 is easy to administer, is able to detect low levels of ill health; and is suitable for use in a general population and fulfils stringent criteria of reliability and validity[11]
- Pain and Opioid Analgesic Use History[12] collected information on types of pain treatment taken and source of treatment taken for opiate problems, routes of prescription opiate use, source of prescription opioids for addiction, reason for addiction, and their view on using prescription opiates at this time once rehabilitation gets over.

### Ethical issues

The study involved only interviewing the subjects and did not involve any intervention. The study protocol, instruments, and informed consent were approved by Institutional Ethics Committee and Research Protocol Evaluation Committee of Sikkim Manipal Institute of Medical Sciences, Gangtok, Sikkim, India.

### Statistical analysis

Descriptive statistics of variables of interest are presented. The mean and standard deviation (SD) are presented for continuous variables. The number and percent of study participants practicing a particular behavior are presented for categorical variables. The Chi-squared ($\chi^2$) test was used to test hypotheses between categorical variables. Significance level was set at $P < 0.05$. Odds ratio (OR), relative risk (RR), and 95% confidence interval (CI) were calculated to estimate associated risk. Data were analyzed by PASW 18.0 (Statistical Package for the Social Sciences, SPSS Inc., Chicago, IL, USA).

## RESULTS

### Demographics and socioeconomic profile

Of the 224 study participants [Tables 1 and 2], only one was female; therefore, she was excluded from final analysis and $n = 223$ male participants were included. The mean age of prescription opioid abusers in Sikkim was 27 years, 61% ($n = 136$) of respondents were of Nepalese ethnicity, only 6.3% ($n = 14$) of respondents were Lepchas, the traditional inhabitants of Sikkim. The majority of them were of Buddhist religion (43.5%), followed by Hindu (42.6%). Respondents' mean age of initiation of prescription opioid use was 20 years. Most of the prescription opioid abusers lived with their parents and with other family members (82.1%, 183 of 224). About 9.4% ($n = 21$) lived alone, and a small percentage (4.9%) lived with their friends.

**Table 1: Demographic profile of prescription opioid abusers ($n$=223)**

| Variable | *n* (%) |
|---|---|
| Age (median) (years) | 27 |
| Ethnicity | |
| Nepali | 136 (61) |
| Bhutia | 43 (19.3) |
| Lepcha | 14 (6.3) |
| Religion | |
| Hinduism | 95 (42.6) |
| Buddhism | 97 (43.5) |
| Christianity | 31 (13.9) |
| Marital status | |
| Single | 140 (62.8) |
| Married | 62 (27.8) |
| Community | |
| Urban | 128 (57.4) |
| Rural | 95 (42.6) |
| Type of accommodation | |
| Own house | 160 (71.7) |
| Rented house | 63 (28.3) |
| Usual living arrangement in past 3 years | |
| Family | 145 (64.7) |
| Parents | 45 (20.2) |
| Alone | 21 (9.4) |
| Friends | 11 (4.9) |
| History of prison/jail stay, lifetime | |
| Mean years of incarceration | 5.52 (5.2) |
| Arrested/charged due to possession of/dealing with prescription opioids | 78 (34.8) |
| Charged for public intoxication, driving while intoxicated | 39 (17.3) |
| History of drug treatment: Lifetime | |
| Money spent on last treatment in Rs., mean (SD) | 21,746 (5183) |
| First treatment initiator by | |
| Family | 127 (57) |
| Relatives | 42 (18.8) |
| Self | 23 (10.3) |
| Neighbors | 9 (4) |
| Law enforcement | 9 (4) |
| Friends | 4 (1.8) |
| Workplace | 2 (0.9) |
| Types of drug treatment program | |
| Outpatient counseling | 67 (29.9) |
| Inpatient/residential treatment | 16 (7.1) |
| AA/NA | 41 (18.3) |
| Detoxification | 223 (100) |
| Source of treatment expenses | |
| Parents | 95 (42.6) |
| Family | 68 (30.4) |
| Self | 27 (12.1) |
| Relatives | 16 (7.1) |
| Treatment provider | |
| NGO | 218 (97.8) |
| Private and government hospital | 5 (2.2) |

SD – Standard deviation; NGO – Nongovernmental organizations; AA – Alcoholics anonymous; NA – Narcotics anonymous

Among those who were married, 4.8% lived alone ($\chi^2 = 63.0$, $P < 0.001$). About 97.8% had lived in the same area since birth. Most (57.4%, $n = 128$) prescription opioid abusers belong to urban community, whereas 42.6% ($n = 95$) belong to rural community. The average monthly expenditure on prescription opioids was Rs. 5651 (3226) (mean, SD). 38.6% ($n = 86$) of prescription opioid abusers reported concurrent alcohol intake to intoxication (more than 5 drinks per day) in last month. Only 4.9% of respondents had never attended school while 88 respondents (39.5%) had dropped out of school even before completing eight standards. Only 69 respondents (30.9%) had completed 12th standard of education. Nearly one-fourth of respondents were unemployed. Among 137 subjects who were employed in different types of jobs, only 42 of 137 (31%) were engaged in part-time work. About 34.8% ($n = 78$) prescription opioid abusers were either arrested or charged one or more times due to possession of/dealing with prescription opioids. There were also reports of fine or legal action for public intoxication (8%), driving while intoxicated (8%) and a major driving violation (1.3%) under the influence of prescription opioids. All of them had undergone detoxification treatment in their lifetime either at a private or government hospital or both. The majority of admissions to detoxification centers were initiated by their family members (57%) and relatives (18.8%). Mean expenses in the last treatment were reported Rs. 21,746 which was paid mainly by their parents (42.6%) and family members (30.5%). Only 7.1% of them had a history of inpatient or residential treatment in a lifetime.

**Table 2: Socioeconomic profile of prescription opioid abusers (*n*=223)**

| Variable | *n* (%) |
|---|---|
| Highest level of education | |
| Illiterate | 11 (4.9) |
| School dropout | 88 (39.5) |
| Class 10 pass | 21 (9.4) |
| Class 12 pass | 69 (30.8) |
| Graduate | 33 (14.7) |
| Postgraduate | 1 (0.4) |
| Type of employment, past 3 years | |
| Employed | 137 (61.2) |
| Full time | 95 (42.4) |
| Part time-regular hours | 28 (12.5) |
| Part time-irregular day work | 14 (6.3) |
| Not employed | 87 (38.8) |
| Student | 28 (12.5) |
| Unemployed | 59 (26.3) |
| Monthly income in Rs. | |
| Mean (SD) income | 9107 (7886) |
| Up to 10,000 | 162 (72.6) |
| 10,001-20,000 | 43 (19.3) |
| Above 20,001 | 18 (8.1) |
| Monthly expenditure on prescription opioid in Rs. | |
| Mean (SD) expenditure | 5651 (3226) |
| Up to 5000 | 124 (55.6) |
| 5001-10,000 | 77 (34.5) |
| Above 10,000 | 22 (9.9) |

SD – Standard deviation

**Table 3: Age distribution of prescription opioid abusers in the community (*n*=223)**

| Age group | Urban *n* (%) | Rural *n* (%) |
|---|---|---|
| 16-19 | 17 (13.3) | 2 (2.1) |
| 20-25 | 49 (38.0) | 34 (35.8) |
| 26-30 | 32 (24.8) | 21 (22.1) |
| >30 | 30 (23.3) | 38 (40.0) |

$\chi^2$=13.9, df=3, *P*=0.003

## Rural versus urban

Prescription opioid abuse was more common among different age groups in urban compared to rural [Table 3], except in the age group of 30 and above ($\chi^2 = 13.9, P < 0.05$). The commonly abused prescription opioids were dextropropoxyphene and codeine. There was a significant difference in age of first use of prescription opioid between rural and urban respondents. The age at which subjects first used substance was earlier among rural group compared to the urban group ($\chi^2 = 7.9, P < 0.05$). Injection sharing was more in urban ($n = 31$, 24%) whereas syringe exchange was observed equally among rural ($n = 06$) and urban ($n = 07$) prescription opioid abusers ($P > 0.05$). Among IDUs, CSW, multiple sex partner (MSP) behavior, knowledge about AIDS and its transmission were present in urban respondents whereas limited condom use was practiced by rural respondents.

## High risk behavior

The mean age of precocious sexual activity [Tables 4 and 5] of prescription opioid abusers was 16 years, whereas that of prescription opioid abusers who had sexual practices with CSW was 19.5 years and 20 years for those who had MSPs. A significant 47.1% ($n = 105$) had MSPs, 37.7% ($n = 84$) had reported any visit to CSW whereas only one participant had reported involvement in MSM (male having sex with male) behavior in lifetime. Frequency of sexual activity with CSW reported mostly was once a month or less (27.4%, $n = 61$), whereas frequency of sexual activity for those having MSPs was 1–3 times a month (18.8%). About 36.8% did not use a condom during sexual intercourse with a nonprimary partner in a lifetime.

Among 223 prescription opioid abusers, 48.2% ($n = 108$) had a history of sexual intercourse in the past month. Vaginal sex was mostly practised. Frequency of vaginal sex with female partners reported mostly was "once a week" ($n = 45$, 20.1%), and that of oral sex was mainly "once or irregular" ($n = 09$, 4%) in the last month. About 13.8% ($n = 31$) respondents used a condom more than half the time in last month during vaginal sex with a female. Our study also found that 2.7% ($n = 06$) respondents injected prescription opioids for a period of 5–15 days in the past month, whereas 3.6% ($n = 08$) shared 1–10 number of injections.

Prescription opioid abusers who were living with family members, showed a higher risk of developing sexual

**Table 4: Sexual behavior among prescription opioid abusers (*n*=223)**

| Variable | *n* (%) |
|---|---|
| History of precocious sexual activity, lifetime | |
| Yes | 94 (42.2) |
| Mean age of first activity in years | 16 |
| Frequency, past year | |
| Monthly | 67 (29.9) |
| Weekly | 26 (11.6) |
| Daily | 2 (0.9) |
| CSW behavior in lifetime | |
| Yes | 84 (37.5) |
| Mean age of first activity in years | 19.55 |
| Frequency, past year | |
| Less than once a month | 36 (16.1) |
| 1-3 times a month | 25 (11.2) |
| About once a week | 4 (1.8) |
| 2-3 times a week | 2 (0.9) |
| MSP behavior in lifetime | |
| Yes | 105 (47.1) |
| Mean age of first activity in years | 20.13 |
| Frequency, past year | |
| Less than once a month | 11 (4.9) |
| 1-3 times a month | 42 (18.8) |
| About once a week | 16 (7.1) |
| 2-3 times a week | 23 (10.3) |
| 4-6 times a week | 6 (2.7) |
| MSM behavior in lifetime | |
| Yes | 1 (0.4) |
| Mean age of first activity in years | 26 |
| Frequency, past year | |
| Less than once a month | 1 (0.4) |
| Frequency condom use with sexual partner (nonprimary partner) | |
| Never | 82 (36.8) |
| Less than once a week | 19 (8.5) |
| About half the time | 28 (12.5) |
| More than half the time | 41 (18.3) |
| Always | 41 (18.3) |
| Don't know/unsure | 09 (4.0) |

CSW – Commercial sex workers; MSP – Multiple sex partners

**Table 5: Risk behavior pattern of prescription opioid abusers, past month (*n*=223)**

| Variable | *n* (%) |
|---|---|
| Prescription opioid injection (days) | |
| 1-4 | 07 (3.1) |
| 5-15 | 06 (2.7) |
| Number of injection shared | |
| 1-10 | 08 (3.6) |
| >10 | 05 (2.2) |
| Times cleaned injection with bleach after someone used | 02 (0.9) |
| Times fixed prescription opioids with another person, then split, 30 days | 10 (4.3) |
| Vaginal/anal/oral sex with number of people | |
| 1-2 | 71 (31.7) |
| 3-4 | 32 (14.3) |
| ≥5 | 05 (2.2) |
| Vaginal/anal/oral sex with number of female partner | |
| 1-2 | 70 (31.3) |
| 3-4 | 32 (14.3) |
| ≥5 | 05 (2.2) |
| Vaginal/anal/oral sex with number of male partner | 01 (0.4) |
| Condom use frequency of male clients, vaginal sex with female | |
| Less than half the time | 12 (5.4) |
| Half the time | 16 (7.1) |
| Greater than half the time | 31 (13.8) |
| Always | 19 (8.5) |
| Frequency of oral sex on you by partner | |
| Once/irregular | 09 (4) |
| <1-1 per week | 07 (3.1) |
| Vaginal sex frequency, male clients | |
| Less than once a week | 25 (11.2) |
| Once a week | 45 (20.1) |
| 2-6 times a week | 31 (13.8) |

practices with CSWs than those who were staying with their friends (OR = 5.8, RR = 4.1, $P = 0.03$). On the other hand, a significant difference in sexual practices with CSW was observed between those who were staying alone and those who were living with family ($\chi^2 = 4.7$, df = 1, $P < 0.05$) and also between those who were staying with friends and those who were living alone ($\chi^2 = 8.2$, df = 1, $P < 0.05$). Risk of developing sexual practices with CSW was higher among those who did not complete 10$^{th}$ standard of education than those who completed (OR = 2.1, RR = 1.6, 95% CI = 1.2-3.7, $P < 0.05$).

## DISCUSSION

This study is an attempt to elucidate the socioeconomic and demographic profile of prescription opioid abusers from Sikkim, as well as study their high risk behavior. Our study found that the first use of prescription opioid started around the age of 20 years and most commonly abused prescription opioids were dextropropoxyphene and codeine in both rural and urban Sikkim. This is a clear indication of diversion from pharmaceutical shops. The majority of them either never attended school or dropped out of school even before completing 8$^{th}$ standards. There was no effect of migration on their prescription opioid abuse as most of them lived in and had started taking prescription opioid in the same place where they were born. It was observed that unemployed and student respondents had started first use of prescription opioid at much lower age than those who were involved in any kind of employment such as business and skilled work. It was also observed that the mean age of first use of prescription opioid was lower among school dropouts than those who had any kind of formal education. The incidence of arrest or legal charges due to possession of prescription opioids was observed more among abusers who had taken prescription opioid between 21 and 30 days during the past month. In our study, only one prescription opioid abuser was a female. This low prevalence of women abusers reported at de-addiction center is supported by the finding of Drug Abuse Monitoring Survey with the percentage of treatment seeking female substance abusers at 2.8%. Our finding indicates that women of Sikkim are less likely than men to have prescription opioid problems. The majority (61%) of prescription opioid abusers were of Nepalese ethnicity and almost equally represents Hindu (42.6%) and Buddhist (43.5%) religion. These findings

can be explained by the fact Nepalese comprise major ethnic population (70%) in Sikkim,[13] and both Hindu and Buddhist are predominant religions in Sikkim.[14]

In our study, the age of first sexual activity and age of first visit to CSW, frequency of sexual activity, and condom use by prescription opioid abusers in lifetime and correlation of their sexual practices with their living status and education were examined. Most respondents reported sexual activity in both past months and lifetime. It was found that first sexual intercourse started around the age of 16 years and first visit to CSW was reported at the age of 19.5 years. Among respondents, 47.1% had MSPs, 36.8% had unprotected sex, and only 0.4% had MSM behavior in their lifetime. This low reporting of MSM behavior by respondents may be due to response bias. Our study also reported that 14.3% had sexual intercourse with 3 or 4 female partners in the last month, whereas homosexuality was reported only in 0.4% of prescription opioid abusers. Only 8.5% ($n = 19$) practised safe intercourse with their female partners past month. This indicates unprotected sex practices with partners other than spouse were quite common, which supports the similar findings of Rapid Assessment Survey of Drug Abuse (RAS) with percentages of 4–24%. Vaginal sex was reported mostly than oral sex by respondents during the past month. The proportion of IDUs of our study (5.8%, $n = 13$), ranges between the findings of National Household Survey (0.1%) and that of RAS of Drug Abuse (43%).[15]

Report from UNODC states that, there is an increased incidence of the use of prescription opioids, syringe exchange, injection sharing, as well as nonsterile practices in Nepal, with whom Sikkim shares its border in the west. Therefore, Sikkim's border with Nepal at west and changing sociocultural values, proximity with other North Eastern states of India, increased migration of people and stringent law at border controls for illicit drugs such as cocaine, heroin makes Sikkim vulnerable for abuse of prescription opioids. The rapid increase in such drug abuse along with the presence of hidden populations of sex workers engaged in drug use and high risk behavior are risk factors for the spread of hepatitis B virus, hepatitis C virus, and HIV. Therefore, it is important to implement intervention programs for prescription opioid abuse in Sikkim.

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