



SOCIO-DEMOGRAPHIC CHARACTERISTICS OF ANALGESIC MISUSE AMONG URBAN YOUNG ADULTS OF EAST SIKKIM, NORTH EAST INDIA: A CONTROLLED, CROSS-SECTIONAL STUDY

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ABSTRACT

Introduction: Inappropriate use of prescription medications without medical supervision and most commonly prescription analgesic misuse has emerged as an important public health issue. Studies have been conducted in other countries to explore and understand various socio-demographic profile, drug use characteristics etc. among the general population. However, little information is available from India describing the magnitude of analgesic misuse.

Aim: This study was conducted to understand various socio-demographic characteristics such as age, sex, religion, marital status, ethnicity, occupation, income, education, role of migration etc. of analgesic misuse in an urban area of East Sikkim among young adults of 15–40 years of age of either sex.

Materials and Methods: A pre-devised questionnaire on socio-demographic characteristic was administered to n=700 subjects after obtaining informed consent. Data was statistically analyzed using SPSS software.

Results: Male participants (53.1%) outnumbered female (46.9%). Majority of the participants were literate (84.7%). Most of the participants were occupationally employed (66.9%), Nepali by ethnicity (58.6%), married (64.3%), and Hindu (67.0%) by religion. Significant statistical differences were reported; source of income ($\chi^2 = 7.326$, $df=1$, $P=0.026$), accommodation type ($\chi^2 = 6.733$, $df=1$, $P=0.009$), average monthly income ($\chi^2 = 9.929$, $df=3$, $P=0.019$), past 30 days incidence of smoking ($\chi^2 = 14.430$, $df=2$, $P=0.001$), pain in the past 30 days ($\chi^2 = 23.282$, $df=1$, $P<0.001$), BMI ($\chi^2 = 140.224$, $df=2$, $P<0.001$).

Conclusion: Both alcohol consumption and smoking are reported significantly in analgesic misusers as compared to non-misusers and also respondents with pain in the past month with a higher body mass index misused more analgesics.

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INTRODUCTION

Misuse of prescription medications and its medical and social consequences are likely to be an important public health problem. This is more significant in a country like India, where there is little control at the population level over procurement of medications without prescriptions. As per WHO, Drug misuse is defined as the use of a drug or substance including prescription medications for a purpose not consistent with legal or medical guidelines.¹

Prescription drug misuse is a global public health problem. Many medications with sedative, anxiolytic, analgesic or stimulant properties have the potential to be inappropriately used without medical supervision. Analgesics are one of the commonest categories of medications routinely used by the

general population and are available without prescription and over-the-counter (OTC). Regular medically unsupervised analgesic use has a likelihood of causing significant medical and consequent social harm over time. A number of studies from different countries have investigated this problem in different contexts and in different age groups. There is currently a lack of consensus about what constitutes prescription misuse and a wide range of opinions have been proposed. Inappropriate medication use is frequently defined on the basis of characteristics of users (i.e., any non-prescribed use), the reason for use (i.e., use for recreational purposes), the presence of clinically significant symptoms (i.e., meeting diagnostic criteria for abuse and dependence) or on the presence of any of these factors. In cases where multiple criteria are used to define misuse there is often a lack of

differentiation among them and various studies use more specific criteria to exclude or include certain types of misuse from consideration altogether.² In the United States of America (USA) national surveys have shown a significant increase in non-medical use of prescription drugs with a particular increase in use of analgesics. Almost 6.4 million or 2.6% Americans were using prescription-type psychotherapeutic drugs without medical supervision in the past month. Of these, 4.7 million used analgesics and the current non-medical use of prescription-type drugs among young adults aged 18 – 25 increased from 5.4% in 2002 to 6.3% in 2005.³ Apart from the USA, misuse of analgesics is an important health issue in other countries also. In a study from Australia, analgesic nephropathy or analgesic abuse-associated analgesic nephropathy (AA-AAN) has been recognized as a disease of the twentieth century. It was recorded that the emergence of AA-AAN was due to aggressive marketing of analgesics and the susceptibility of individuals with addictive personalities to analgesic abuse.⁴

Sikkim is a hilly state in North East India and is located in the foothills of the Himalayas. Sikkim shares international borders with Nepal, Bhutan and Tibet and it has observed great changes in its social & political structure, economic life and cultural values during the past few decades.⁵

Although systematic data on prescription drug misuse is not available in India one study has demonstrated a high consumption of prescription medications among children with significant consumption of analgesics. One hundred and seventy two children were prescribed, in 212 episodes of illness, antimicrobial agents (28.4%), followed by anti-diarrheals (10.9%), nutritional products (9.4%), analgesics (7.5%) and steroids (6.8%).⁶ Thus, a number of studies have been conducted in other countries to estimate the problem of analgesic misuse, however very little information is available from the Indian scenario. Therefore, the present study has an important public health implication.

This study was conducted to understand the socio-demographic characteristics of analgesic misuse in an urban area of Sikkim in a young adult population (15 – 40 years of age) of either sex. Analgesic misuse was defined in this study as any current (past 30 days) use of analgesics for indications other than everyday kind of pain (e.g., minor headache, sprain, toothache, pre-menstrual syndrome) without medical advice.^{7, 8, 9}

MATERIALS AND METHODS

Selection of study subjects: Youth is defined as men and women in the age group of 15 – 24 years;¹⁰ and young adults are considered up to the age of 40 years.¹¹ In this study only young adults (15 – 40 years of age) of either sex was enrolled as participants as this population were less likely to have comorbid age-related chronic medical conditions requiring regular analgesic use; more likely to develop adverse consequences of regular analgesic use like gastrointestinal and renal adverse events as well as dependence over their lifetime; and this population was the best group for prevention measures.

Sampling Method & Size: Current population of Gangtok is approximately 98,568;¹² i.e., approximately 1,00,000. According to current population pyramid of India approximately 35% of the total population belongs to the age group of 15 – 40 years.¹³ Therefore, in Gangtok, an

approximate 35,000 people were expected to be in the age group of 15 – 40. Prevalence of regular analgesic use in age groups above 14 years has been reported in the range of 7.2 to 34.8% in European studies. Therefore, considering a younger age group of our study population (15 – 40 years) we assume an estimated prevalence of 5% analgesic misuse with an acceptable lower limit of 2% in both rural and urban sites. To detect this prevalence at a 95% confidence interval the study enrolled n=700 subjects at the urban Gangtok site. Further stratification according to age groups and gender was carried out during recruitment and stratification was adjusted according to actual percentage of population according to gender and age groups (15 – 25 years, 26 – 35 years and 36 – 40 years).

The sampling strategy involved identification of sampling locations in each site. Sampling locations mostly included schools (age group 15 – 17 years), colleges (age group 18 – 22 years) and households where people in the age group of 15 – 40 years commonly aggregate and live. The study did not involve only a household survey, but assumed a more ethnographic approach. Any subject satisfying the age criteria for inclusion was eligible for the study.

Instruments: The source document was a validated case record form constituting the following:

- A generic socio-demographics section (e.g., age, gender, education, ethnicity etc.), which is a 21-item questionnaire including questions on alcohol use and smoking.
- A generic analgesic misuse questionnaire, comprising measures of non-steroidal and opioid analgesic use without medical advice, which is a 21-item questionnaire including information on treatment of pain and ease of availability of analgesics.¹⁴

The socio-demographic questionnaire on population survey on analgesic use was used for analgesic users and comprised of the few following questions:

- Lifetime use of Alcohol, Smoking and Drugs by the respondent.
- Past 30 days use of Alcohol, Smoking and Drugs by the respondent.
- Age of first use of Alcohol, Smoking and Drugs by the respondent.

Ethical Issues: The study consisted of only interviews and subsequent data analysis from questionnaires and did not involve any patient contact, medical, behavioral, therapeutic or instrumental intervention. The study protocol, instruments/questionnaire, informed consent was duly approved by Institutional Ethics Committee (IEC).

Design and Study Sites: The study was a cross-sectional general population survey. Proposed study site included an urban area in East Sikkim. The selected urban site was Gangtok and its surroundings, East Sikkim, the most important city in Sikkim. Identification as urban site was based on criteria provided by Urban Development and Housing Department, Government of Sikkim, Gangtok.

The study was conducted during the period of 2013 to 2015. A total of n=700 subjects were screened during this period. They were the target population of the study.

Data Collection: Data collection was based on personal interviews with the participants. Before interview, the participants were explained about the nature and objective of the study and the nature of questions involved. Confidentiality was ensured and it was also mentioned that they have the freedom of refraining from any response. The respondents were also briefed about the need of their honest answers in order to get correct information. The interview was initiated only after the participant understood, voluntarily agreed and signed (or left thumb impression) the informed consent form. Informed consent was obtained from competent person. The informed consent form was originally made in English language and then was translated to Hindi and Nepali language for a better understanding of the participants. They were given a copy of the signed informed consent. During interview local Nepali language, Hindi or English was used as per the convenience of the participant. Questionnaire on socio-demographic profile; i.e., information on religion, ethnicity, age, gender, marital status, average monthly income, status of education, occupation etc. from each of the study participants were recorded on the printed paper questionnaire form. Participants were not given any monetary or other compensation in lieu of participation in the study.

Statistical Analysis

Data was fed in Statistical Package for the Social Sciences (SPSS), version 20, IBM Corp. Before analysis all entries were checked and cleaned by ignoring or putting missing value codes for inconsistent or ambiguous values. The frequency distribution analysis was done by running descriptive analysis and Chi-square was run for nonparametric data to show the significant difference, if any. Level of significance was set at p 0.05.

RESULTS

Table 1 Socio-demographic characteristics of participants (n=700)

Variables	Category	N	Percentages
Gender	Male	372	53.1
	Female	328	46.9
Level of education	Illiterate and school dropout	318	45.4
	School completed	140	20.0
	Graduate and above	242	34.6
Source of income	Salaried	341	57.2
	Self-employed	127	21.3
	Unemployed (Non-student)	128	21.5
Current occupation	Skilled	130	18.6
	Semi-skilled	207	29.6
	Unskilled	131	18.7
	Unemployed	232	33.1
Type of accommodation	Own	170	24.3
	Rented	530	75.7
Ethnicity	Lepcha	96	13.7
	Bhutia	115	16.4
	Nepali	410	58.6
	Others	79	11.3
Marital status	Single	237	33.9
	Married	450	64.3
	Others (Divorced/Separated)	13	1.9
Religion	Hindu	469	67.0
	Buddhist	157	22.4
	Others	74	10.6
Migration	Yes	80	11.4
	No	620	88.6
Average Monthly Income	No income	232	33.1
	Less than 5,000	131	18.7
	5000 to less than 10,000	165	23.6
	10,000 to less than 20,000	102	14.6
	20,000 and above	70	10.0

[Table 1] shows the socio economic and demographic characteristics of all the participants (n = 700) of the study. The male participants (53.1%) outnumbered female (46.9%). The age range of male and female participants were between 15 and 40 years. Predominant participants (79.1%) were in the age group of 15-35years. Majority of the participants were either Illiterate or in the school dropout group (45.4%). Most of the participants were salaried (57.2%), mainly Nepali by ethnicity (58.6%), married (64.3%), and Hindu by religion (67.0%). The average monthly income of most of the participants (56.9%) was below INR 20,000/month. [Table 2] shows history and pattern of use of analgesics, alcohol and smoking. Mean age of first use of analgesics was 27.96 (SD=6.83), mean age of first use of alcohol was 23.54 (SD=4.27), mean age of first smoking was 23.22 (SD=3.06). Mean analgesic of use in the past one month was 7.20 (SD=4.77), mean alcohol use in the past one month was 1.79 (SD=1.04), mean incidence of smoking in the past one month was 7.15 (SD=4.78). Mean lifetime use of analgesic was 2.61 (SD=2.25), mean lifetime use of alcohol was 4.79 (SD=3.58), mean lifetime smoking was 3.54 (SD=3.37). [Table 3] shows the alcohol use and smoking between misusers and non-misusers of analgesics. Alcohol use past month ($\chi^2 = 5.031, df=2, P=0.081$), alcohol, lifetime use in years ($\chi^2 = 18.556, df=2, P<0.001$), Smoking past month ($\chi^2 = 14.430, df=2, P=0.001$), smoking lifetime use ($\chi^2 = 14.430, df=2, P=0.001$).

Table 2 Pattern of alcohol use along with smoking among participants

Variables	Range	Mean (SD)
Age of respondents (years)	15-40	28.58 (7.01)
Age of First Use, Alcohol (years)	16-37	23.54 (4.27)
Alcohol use, past month (drink/day/week)	01-23	1.99 (2.24)
Alcohol, lifetime use in years (exclude last 30 days)	01-15	4.79 (3.59)
Age of First Smoking (years)	17-36	23.22 (3.06)
Smoking, past month (no. of times)	01-23	7.15 (4.78)
Smoking, lifetime use (exclude last 30 days)	01-17	3.54 (3.37)

Table 3 Alcohol use and smoking between misusers and non-misusers of analgesics

Characteristics	Analgesic Misuse (%)	No Misuse (%)	P
Alcohol use, past month (drink/day/week)	No use	355 (58.29)	$\chi^2 = 5.031, df=2, P=0.081$
	Less than 3drinks/day/week	211(34.65)	
	More than or equal to 3drinks/day/week	43 (7.06)	
Alcohol, lifetime use in years (exclude last 30 days)	No use	355 (58.29)	$\chi^2 = 18.556, df=2, P<0.001$
	1 year to 10 years	203 (33.34)	
	More than 10 years	51 (8.37)	
Smoking, past month (no. of times)	None	407 (66.83)	$\chi^2 = 14.430, df=2, P=0.001$
	Less than 10 times	113 (18.56)	
	10 times and more	89 (14.61)	
Smoking, lifetime use (exclude last 30 days)	No use	394 (64.70)	$\chi^2 = 46.434, df=4, P<0.001$
	1 year to less than 3 years	105 (17.24)	
	3 years to less than 8 years	83 (13.63)	
	8 years to less than 15 years	24 (3.94)	
	15 years and more	03 (0.49)	

Table 4 Socio-demographic differences between analgesic misuse and no misuse

Characteristics	Analgesic Misuse (%)	No Misuse (%)	P
Gender			
Male	55 (60.44)	317 (52.05)	$\chi^2 = 2.236$, df=1, P=0.135
Female	36 (39.56)	292 (47.95)	
Age			
15-25 years	31 (34.07)	243 (39.90)	$\chi^2 = 2.945$, df=2, P=0.229
26-35 years	35 (38.46)	245 (40.23)	
36-40 years	25 (27.47)	121 (19.87)	
Source of Income			
Salaried	37 (40.66)	304 (49.92)	$\chi^2 = 7.326$, df=1, P=0.026
Self-employed	26 (28.57)	101 (16.58)	
Unemployed	18(19.78)	110 (18.06)	
Students	10 (10.99)	185 (30.38)	
Type of Accommodation			
Owned	32 (35.16)	138 (22.66)	$\chi^2 = 6.733$, df=1, P=0.009
Rented	59 (64.84)	471 (77.34)	
Ethnicity			
Nepali	50 (54.95)	360 (59.11)	$\chi^2 = 1.323$, df=3, P=0.724
Lepcha	15 (16.48)	81(13.30)	
Bhutia	17 (18.68)	98 (16.09)	
Others	09 (9.89)	70 (11.49)	
Religion			
Hindu	59 (64.84)	410 (67.32)	$\chi^2 = 0.320$, df=2, P=0.852
Buddhist	21(23.08)	136 (22.33)	
Others	11(12.09)	63 (10.34)	
Marital Status			
Single	28 (30.77)	209 (34.32)	$\chi^2 = 3.929$, df=2, P=0.140
Married	59 (64.84)	391 (64.20)	
Others (Divorced/Separated)	04 (4.40)	09 (1.48)	
Average Monthly income			
No income	29 (31.87)	203 (33.34)	$\chi^2 = 9.929$, df=3, P=0.019
Less than 5000	08 (8.79)	123 (20.20)	
5000 to less than 20000	46 (50.55)	221 (36.29)	
20000 and above	08 (8.79)	62 (10.18)	
Migration			
Yes	09 (9.89)	71 (11.66)	$\chi^2 = 0.245$, df=1, P=0.621
No	82 (90.11)	538 (88.34)	
Level of Education			
Illiterate and school dropout	39 (42.86)	279 (45.81)	$\chi^2 = 0.655$, df=2, P=0.721
School completed	21 (23.08)	119 (19.54)	
Graduate and above	31 (34.07)	211 (34.65)	
Past 30 days use of Alcohol			
No use	45 (49.45)	355 (58.29)	$\chi^2 = 5.031$, df=2, P=0.081
Less than 3drinks/day/week	34 (37.36)	211(34.65)	
More than or equal to 3drinks/day/week	12 (13.19)	43 (7.06)	
Past 30 days incidence of Smoking			
None	44 (48.35)	407 (66.83)	$\chi^2 = 14.430$, df=2, P=0.001
Less than 10 times	21 (23.08)	113 (18.56)	
10 times and more	26 (28.57)	89 (14.61)	
Pain in the past 30 days			
Yes	42 (46.15)	137 (22.50)	$\chi^2 = 23.282$, df=1, P<0.001
No	49 (53.85)	472 (77.50)	
BMI			
Below 18.5	15 (16.48)	89 (14.61)	$\chi^2 = 140.224$, df=2, P<0.001
18.5 – 24.9	23 (25.27)	458 (75.21)	
Above 25.0	53 (58.24)	62 (10.18)	

[Table 4] shows the socio-demographic differences between analgesic misuse and no misuse. Significant differences were reported; source of income ($\chi^2 = 7.326$, df=1, P=0.026), type of accommodation ($\chi^2 = 6.733$, df=1, P=0.009), average monthly income ($\chi^2 = 9.929$, df=3, P=0.019), past 30 days incidence of smoking ($\chi^2 = 14.430$, df=2, P=0.001), pain in the past 30 days ($\chi^2 = 23.282$, df=1, P<0.001), Body mass index ($\chi^2 = 140.224$, df=2, P<0.001).

DISCUSSION

This study is an effort to reveal the socio-demographic characteristics of analgesic misuse among the young adult population.

Female subjects reported in our study was less (46.9%) than the males (53.1%) and females subjects misusing analgesics was also reported to be less than males [Table 4]. In contrary, a study by Rahul Shrotri *et al*, on OTC (over the counter) drug use characteristics in retail pharmacies in Indore city, found that more number of females are seeking for OTC drugs than male counterparts from pharmacies, of whom OTC analgesic use was observed more.¹⁵ When compared with the study of Goel *et al.*, 2010, and study of home department, Government of Sikkim, the respondents were having lower literacy (Amit Goel *et al.*, 2009-98%), marital status (Amit Goel *et al.*, 2009-57.3%), more number of respondents were in school dropout group and majority of alcohol and/or drug abusers were Nepali (66.8%) by ethnicity¹⁶ and the present study showed lower

literacy rate (45.8%), marital status (64.84%) and majority of alcohol and/or analgesic misusers were Nepali (58.6%) by ethnicity. [Table 2] and [Table 3] shows the pattern of alcohol use and smoking between misusers and non-misusers of analgesics. Significant statistical differences was observed in lifetime alcohol use in years, smoking in the past month and lifetime smoking. A study by Dart reported that the effects of analgesic use was higher in those who consume alcohol.¹⁷ Another survey of drug/psychoactive substance use among adolescent students in a south-west province of China reported that the life-time use of at least 15 times during in any one month of tobacco 6.3%, non-steroid anti-inflammatory drugs (NSAID) 2.9%, alcohol 2.9%, which showed that drug misuse has appeared among adolescent students with lifetime consumption of alcohol and smoking.⁸ [Table 4] showed most of the subjects misusing analgesics were salaried individuals (40.66%), with an average monthly income of INR 5,000/month to less than INR 20,000/month (50.55%), living in rented accommodation (64.84%), having a higher Body Mass Index (58.24%) with past 30 days incidence of smoking (51.65%) and pain (53.85%).

CONCLUSION

Lifetime alcohol use and smoking could be correlated with the climatic and geographical location of Sikkim. However, both alcohol consumption and smoking are reported significantly in analgesic misusers as compared to non-misusers. Also respondents with pain in the past month with a higher body mass index misused more analgesics. Hence, based on the socio-demographic evidences, this study shall provide baseline information to design further studies to detect the risk factors of analgesic misuse and further help to formulate prevention measures.

References

1. World Health Organization. Lexicon of Alcohol and Drug Terms. *World Health Organization, Geneva, Switzerland*. 1994.
2. Barrett SP, JR Meisner, *et al*. What constitutes prescription drug misuse? Problems and pitfalls of current conceptualizations. *Curr Drug Abuse Rev*.2008; 1(3): 255-62.
3. Manchikanti L. National drug control policy and prescription drug abuse: facts and fallacies. *Pain Physician*. 2007; 10(3): 399-424.
4. Nanra RS. Analgesic nephropathy in the 1990s-an Australian perspective. *Kidney Int Suppl*. 1993; 42: S86-92.
5. Bhalla A, Dutta S, Chakrabarti A. A profile of substance abusers using the emergency services in a tertiary care hospital in Sikkim. *Indian J Psychiatry* 2006; 48:243-7.
6. Prakash O, Mathur GP. *et al*. Prescription audit of under six children living in periurban areas. *Indian Pediatr*. 1989; 26(9): 900-4.
7. Plantinga L, Grubbs V, Sarkar U, Hsu CY, Hedgeman E, Robinson B, Saran R, Geiss L, Burrows NR, Eberhardt M, Powe N. Nonsteroidal anti-inflammatory drug use among persons with chronic kidney disease in the United States. *Ann Fam Med*. 2011; 9(5): 423-30.
8. Liu Z, Zhou W. *et al*. The use of psychoactive substances among adolescent students in an area in the south-west of China. *Addiction*. 2001; 96(2): 247-50.
9. Ferraz MB, Pereira RB, Paiva JG, Atra E, DosSantos JQ. Availability of over-the-counter drugs for arthritis in Sao Paulo, Brazil. *Soc Sci Med*. 1996; 42(8):1129-31.
10. Parasuraman S, Kishor S, Singh SK, Vaidehi Y. A Profile of Youth in India. National Family Health Survey (NFHS-3), India, 2005-06. International Institute for Population Sciences, Mumbai; ICF Macro, Calverton, Maryland, USA. 2006.
11. Erikson E. Youth and the Evolution of Identity. *Childhood and Society*, Norton, New York, USA. 1998; 278-374.
12. Office of the Registrar General and Census Commissioner. Census of India 2011, Provisional Population Totals. Registrar General and Census Commissioner, New Delhi, India. 2011.
13. Technical Group on Population Projections - Registrar General of India (RGI). Changes in Population Pyramid - India (1971-2016) National Commission on Population, Government of India 1996. Available from <http://populationcommission.nic.in/facts1.htm>. Accessed on August 28, 2011.
14. Atkinson TM, Mendoza TR, Sit L, Passik S, Scher HI, Cleeland C, *et al*. The Brief Pain Inventory and its Pain at its worst in the last 24 hours item: Clinical Trial Endpoint Considerations. *Pain Med*. 2009.
15. Rahul S, Neelesh N, Mithun Singh R. Der Pharmacia Lettre [Internet]. 2011; 3(3): 135. Available from: <http://scholarsresearchlibrary.com/archive.htm>
16. Goel A, Chakrabarti A. Prevalence and sociodemographic correlates of substance use in a rural community in Sikkim, North East India: Results from a pilot population survey. *J Subst Use*. 2010; 15:13-23.
17. Dart RC. The use and effect of analgesics in patients who regularly drink alcohol. *Am J Manag Care*. 2001; 19 Suppl: S597-601.

