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Epidemiology of substance use and dependence in the state of Punjab, India: Results of a household survey on a statewide representative sample

Ajit Avasthi[a], Debasish Basu[f,*], B.N. Subodh[a], Pramod Kumar Gupta[b], B.S. Sidhu[c], P.D. Gargi[d], Arvind Sharma[e], Abhishek Ghosh[f], Poonam Rani[g]

[a] Department of Psychiatry, Postgraduate Institute of Medical Education & Research (PGIMER), Chandigarh, India
[b] Department of Biostatistics, Postgraduate Institute of Medical Education & Research (PGIMER), Chandigarh, India
[c] Department of Psychiatry, Government Medical College, Patiala, India
[d] Department of Psychiatry, Government Medical College, Amritsar, India
[e] Department of Psychiatry, Guru Gobind Singh Medical College (GGSMC), Baba Farid University of Heath Sciences, Faridkot, India
[f] Drug De-addiction & Treatment Centre (DDTC), Department of Psychiatry, Postgraduate Institute of Medical Education & Research (PGIMER), Chandigarh, India
[g] Department of Radiotherapy and Oncology, Government Medical College & Hospital, Sector 32, Chandigarh, India

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ABSTRACT

Background: Despite its political sensitivity, little scientifically valid evidence on the prevalence, pattern and treatment need of substance use in the northern border state of Punjab, India is available till date.
Methodology: The 'universe' for the survey was the entire house-dwelling population of Punjab, of both genders, aged 11–60 years. Stratified multistage sampling technique was used. Following a pilot study, data were collected by trained research workers by face-to-face interview using pre-tested survey instruments.
Results: From 6398 households, 13,925 respondents were interviewed. Prevalence of lifetime and current (12 month) dependence on any substance were 15.8% (95% confidence interval [CI] 15.1–16.4%) and 14.7% (95% CI 14.1–15.3%) respectively. Of the specific substances, current dependence was the highest on alcohol (10.9%; 95% CI 10.3–11.4%), followed by tobacco (8.1%; 95% CI 7.7–8.6%). Regarding opioids, lifetime use was 1.9% (95% CI 1.6–2.1%) and current dependence 0.8% (95%CI 0.7–1.0%). Use of and dependence on natural opioids was the highest. After projecting these figures to the entire source population of the state, number of currently dependent alcohol, tobacco and opioid users were 2.2, 1.6, and 0.17 million, respectively. Overall, substance use was predominant in men and significantly more common in rural areas. Majority (81%) of the tobacco users, and 51% each of alcohol and opioid users needed intervention. However, merely one in six subjects sought any professional help.
Conclusion: Punjab has a substantive problem related to substance use. Though alcohol and tobacco are by far the major substances of use and dependence, the large number of opioid users also raises concern. Treatment services need scaling-up.

1. Introduction

Substance use is a multifaceted and dynamic problem. Hence understanding the epidemiology of substance use is also a multipronged and ongoing process. India reported its first national level survey on the extent, pattern, and trends of substance use in 2004, based on data collected in 2000–2001 (Ray, 2004). It was a multi-component survey, and one of the components was the National Household Survey (NHS). Population based surveys act as an indispensible component for health planning. It helps in developing policy and in program monitoring and evaluation. The NHS, with its acknowledged limitation for the estimation of illicit drugs, reported current use of alcohol, cannabis, and any opioids as 21 percent, 3 percent, and 0.7 percent respectively. Injection drug use was observed to have frequency of 0.1 percent. The national household survey did not provide state wise data for substance use, nor did it provide substance use data in women, whereas the latter has emerged as an important issue (Murthy, 2002; Benegal et al., 2005; Murthy, 2008).

Excessive use of alcohol, tobacco and other drugs in the state of Punjab in India has been highlighted in several studies dating back to

* Corresponding author.
E-mail addresses: drajitavasthi@yahoo.co.in (A. Avasthi), db_sm2002@yahoo.com (D. Basu), drsubodhbn2002@gmail.com (B.N. Subodh), guptapkg@gmail.com (P.K. Gupta), drbssidhumd@yahoo.com (B.S. Sidhu), gargpdass@gmail.com (P.D. Gargi), arvindsharma7557@gmail.com (A. Sharma), ghoshabhishek12@gmail.com (A. Ghosh), poonambajaj.pu@gmail.com (P. Rani).

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the 1970s. Recently the phenomenon of substance use in Punjab has been claimed to have reached epidemic proportions, which is said to be ruining the socioeconomic fabric of the entire state, with consequences of national importance. Over the past several years, several reports of rampant drug abuse appearing in the media have rocked the state of Punjab and understandably created a socio-political furor. Punjab, one of the 29 states in India, is situated in the northern part of the country. It shares international border with Pakistan on its west (which further shares its own western border with Afghanistan, one of the highest opium and heroin producing countries in the world), and national borders with the states of Jammu & Kashmir in the north, Himachal Pradesh in the east, and Haryana and Rajasthan in the south, each with its own substance production and use characteristic. Its geopolitical location perhaps makes it vulnerable for substance use either as a trafficking route or as a consuming state or both. Despite this widely perceived drug use problem and vulnerable status, not much scientific evidence is available till date. Some published data are very old now (Lal and Singh, 1979; Varma et al., 1980). Punjab Opioid Dependence Survey (PODS) was conducted recently, but it had an exclusive focus on opioid dependence (Punjab Opioid Dependence Survey, 2016). Other relatively recent studies are not representative of the entire state or general population, and with varying methodology (Sachdev et al., 2002; Chavan et al., 2007; Mahi et al., 2011; Basu et al., 2008).

Against this backdrop of geopolitical, socioeconomic and public health urgency and sensitivity, the study titled 'Epidemiology of Substance Use and Dependence in the State of Punjab' (ESUDSP) was planned to understand the epidemiology of substance use and dependence in Punjab, with aims to estimate the substance use scenario (both licit and illicit) of the entire state, and to understand treatment needs, all pertaining to both the genders. It was funded by the Department of Health Research (DHR), Government of India and conducted under the supervision of Indian Council of Medical Research (ICMR).

There were three arms in this survey, namely, the State of Punjab Household Survey (SPHS), rapid assessment survey, and data from treatment seeking population. This paper highlights the key findings of the SPHS.

2. Aim and objectives

Although the overall aim of the ESUDSP was to study the epidemiology of psychoactive substance use and dependence in the State of Punjab in all its aspects, the specific objectives of SPHS were to generate general population based state-level data on the prevalence (in terms of percentages), size (in terms of numbers) and characteristics of all categories of substance use and dependence, and on the treatment needs and treatment seeking of the substance using population.

3. Methods

The 'universe' for the survey was the entire house-dwelling population of Punjab, of both genders, aged 11–60 years. This was based on the 2011 census (http://censusindia.gov.in). Sample was collected from 27th Nov 2015 to 9th April 2016.

3.1. Calculation of sample size

Since a representative prevalence estimate for the entire state of Punjab is not available and limited recent studies were undertaken on this subject, several conservative assumptions had to be adopted in the design process. These assumptions were: at least 1% prevalence of ICD-10-defined substance dependence (not simply use or harmful use) with relative precision of 25% and the design effect of 1.5 to compensate for the complex sampling procedure (combination of stratified sampling, systematic sampling, and simple random sampling) so as to obtain a confidently large sample. Using appropriate formula, the minimum requisite sample size for the SPHS was calculated to be 9128. After adjusting for 30% anticipated non-response the number came out to be 13040. This was the targeted number calculated to provide state level estimates for Punjab. The sample size estimation was performed using statistical software R.3.4.1 on 32-bits machine with Window 10 OS. The inbuilt formula for sample size is the standard formula for prevalence.

3.2. Operational structure

Postgraduate Institute of Medical Education and Research (PGIMER), Chandigarh, India was the Coordinating Centre as the overall in-charge of the entire operation. The relevant administrative departments of the State of Punjab had administrative and facilitative roles to direct the respective individual centres/agencies (Medical Colleges, Government De-addiction Centres, non-government organizations or NGOs) to ensure cooperation and smooth functioning, but played no role in the actual data collection procedure. The three Government Medical Colleges in the state of Punjab acted as local Participating Centres for individual district-level activities (each Participating Centre was responsible for 7–8 districts and coordinated and supervised district-level field activities). Each team comprised of one trained interviewer and a local facilitator conversant with local populations to assist the trained interviewers for conducting the survey. Fig. 1 depicts the overall operational structure in nutshell. Such an operational structure was important for smooth conduction and effective coordination of the study.

3.3. Sampling procedure

According to the 2011 population census of Punjab, the state of Punjab is comprised of 22 districts. All 22 districts were included in the study: one city and one village from every district were selected. Stratified multistage sampling technique was used for collection of data. The sampling frame consisted of all households listed in the 2011 population census of Punjab. All 22 district headquarter cities of Punjab were included in the sample for urban area. Each district is comprised of Blocks, whose number varies from 02 to 12. The total number of Blocks is 148. Each Block consists of villages, whose number varies from 125 to 1421. The total number of villages is 12592.

At the first stage, 3 participating centers were set up in Punjab, which geographically clustered the 22 districts of Punjab into three zones. Zone 1 and Zone 2 comprised 7 districts each whereas Zone 3 consisted of 8 districts.

It was also prerequisite of the project to maintain the male and female ratio into 2:1 in order to understand extent and pattern of substance use among female population.

Zone-1, Zone-2 and Zone-3 respectively shared 37.13%, 35.77% and 27.10% proportion in population of Punjab. We ensured that the same proportion to be adhered in the final sample using PPS approach to ensure that all units in the population have the same probability of selection irrespective of the size of the cluster by assigning weights so that larger clusters have greater probability of being sampled (Peters and Eachus, 1995). The final sample thus consisted of 4842 (37.13%), 4665 (35.77%) and 3533 (27.10%) study units at Zone-1, Zone-2 and Zone-3 respectively. Since population proportion was different in each district within each zone, therefore PPS procedure was also used to ensure the similar proportion in sample for better representation. The 2:1 ratio for male and female is also maintained to meet the prerequisite.

At the second stage, 22 district capital cities were included to cover the urban population. For rural population, one Block from each district and thereafter one village from the selected Block were identified using simple random sampling. Those villages whose population proportion was less than the number required to meet study unit in the sample were excluded from the random list.

At the third stage, households in city area were enumerated using simple random sampling whereas systematic random sampling was