Original Research Article

Evaluating substance use in an urbanizing town of mid hills of Northern India

Ajay K Singh1, Kushel Verma2*, Amit Gulera3, Shalini Puri1, Ankit Sharma2, Vaishali Sharma4

1District Programme Officer, Department Health and Family Welfare, Solan, Himachal Pradesh, India
2Medical Officer, 3Counsellor (De-addiction), Regional Hospital, Solan, Himachal Pradesh, India
3Department of Economics and Sociology, PAU Ludhiana, Punjab, India

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*Correspondence:
Dr. Kushel Verma,
E-mail: drvermakushel@rediffmail.com

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ABSTRACT

Background: Substance use is emerging as a major cause of morbidity and mortality across the world. Solan, a fast urbanizing town of India has witnessed mushrooming of industries and educational institutes. A surge in the persons booked under the Narcotic Drug and Psychoactive Substance Act 1985 led us to look into the determinants of the substance use in this region.

Methods: We undertook a cross sectional study of one year secondary data analysis of 750 substance users screened at the de-addiction centre of Solan Hospital. The data mining was done by the cluster analysis technique. SPSS 16 and STATA 13 software were employed.

Results: Mean age of users was 31 years with dominance of males (89.20 %), two third of total users were married, 75% were unemployed, 42% had upper school level education. About 60 and 38% were using cannabis and chitta (a synthetic opioid) respectively. Only 2% were consuming tobacco and alcohol. 62% of substance users had the fear of legal action and 44% had no family history of substance use. 39% had only single parent, 54% had started substance use under peer pressure and duration of use varied between 6 to 24 months. Alcohol and cannabis were used more in urban and rural areas respectively. 63 and 70% had family history and experience of peer pressure respectively.

Conclusions: Cluster analysis has generated substance specific socio-demographic determinants of substance use which would help in planning appropriate substance use alleviation strategies.

Keywords: Cannabis, Chitta, Cluster analysis, De-addiction, Secondary data, Substance use

INTRODUCTION

Globally smoking, alcohol and illicit drug use kills 11.8 million people each year which is more than the number of deaths from all cancers.1 Health target 3.5 of Sustainable Development Goals 2030 aims at monitoring the progress in advancing treatment coverage for substance use disorders. 1.5% of global disease burden is attributed to alcohol and illicit drug addiction. The substance abuse i.e. the harmful and hazardous use of psychoactive substances including alcohol and illicit drugs is emerging as a big public health challenge worldwide. Therefore, policies have been put in place which influence the levels and patterns of substance use and related harm and can significantly reduce the public health problem attributable to substance use. Substance use especially in the adolescent age group/young people is often associated with experimental substance use in the initial point of time and this is further determined by many individual personality traits such as impulsivity, sensation seeking, genetic variations like single nucleotide polymorphisms in the fatty acid amide hydrolase (FAAH) gene.2,4 Certain variables like age at inception of regular substance use, the type of substance of dependence, depression, both state and trait anxiety
affect suicidal tendency, borderline personality behaviour, anger, hostility and aggression. There may exist a relation of educational, employment and marital status with the substance abuse. Characteristics such as negative affect, impulsivity and childhood trauma determine the risk of dissociation and behaviors’ such as suicide attempt or self-mutilation. Traits such as impulsivity act as a temperamental vulnerability factor for substance abuse. Impulsivity and sensation seeking personality traits highly determine the substance abuse especially in the age group attending the universities or colleges.

In India 14.6% of population (between 10 and 75 years of age) uses alcohol whereas use of any form of cannabis was 2.8% in the population and 2.1% of the country’s population used opioids. In Himachal Pradesh, a small state in North Western Himalayas in India the total violent crime rate of 25.6%, 18.5% crime rate registered under the Narcotic Drugs and Psychotropic Substance (NDPS) Act 1985 of the country, 5.7% for the possession of drugs for personal use and consumption, 12.8% for possession of drugs for trafficking and 54% crime rate for liquor and drugs related acts present an alarming picture. Moreover, this assumes more weight in the context of the state population being only 0.57% of the whole country and with a high literacy rate of 83.78%. Solan is one of the fastest growing districts of the state of Himachal Pradesh with mushrooming of industries and educational institutes in the region. Various challenges associated with migratory population dynamics surface in this district. One of them in the recent past has been the growing menace of substance use and drug trafficking. The police recorded a large number of cases booked under the NDPS Act 1985. This led us to undertake the present study with the objectives of assessing the pattern and the determinants of substance use in Solan district, so as to plan interventions for its alleviation from the region.

METHODS

Design and study participants

It was a retrospective hospital record based descriptive epidemiological study of 750 substance users who had been screened at the District Level De-addiction center of district Hospital of Solan. Situational analysis of the secondary data of the screening conducted in the year 2019 was undertaken.

Statistical analysis

The statistical tools such as SPSS 16.0 and STATATA 13.0 were used for analyses of the results. Descriptive epidemiology was employed enumerating the demographic attributes (age, sex, socio-economic status, marital status, education, locality, single parent and occupation) and social determinants related to drug addiction (Number of drug consumption, number of relapse, fear of legal action, family history, peer pressure, duration of substance use and single substance use) using the frequencies, mean, standard deviation and the range. Chi-square test was used to test the significance of measure of association between the substance use and other attributes.

The secondary data was analyzed with Cluster analysis technique. Cluster analysis aims at the detection of natural partitioning of sample. In other words, it group observations that are similar into homogenous subsets. These subclasses may reveal patterns related to the phenomenon under study. A distance function is used to assess if the similarity between the sample respondents and a wide variety of clustering algorithms based on different concepts is available. Similarity measures are first computed between observations, and between clusters once observations begin to be grouped into clusters. Several metrics, such as Euclidean distance, correlation, or mutual information was used to compute similarity in the present study.

Hierarchical cluster analysis (HCA) was used to identify the number of cluster by hierarchical configuration-a tree called a dendrogram. After identification, K-means algorithm (or K-medoids, depending on the statistic applied) was applied for clustering which is an iterative method that starts with k cluster centers chosen by HCA. All observations were then associated to the closest cluster center and new centers were computed as the mean of the observations of a given cluster. The observations were grouped with respect to the new centers iteratively until convergence; that is, no difference occurred in the next iteration. The Chi-square test was also used to test the significance of measure of association between clusters and other attributes. p value of less than 0.05 was assumed to be significant.

RESULTS

Table 1 provides the demographic features of the drug addicts (n=750). The mean age of the drug addicts was 31 years with the range of 13 to 62 years. Males dominated the substance user’s population with 89.20 per cent and the two third of total users were married. More than 65 per cent of the respondents belonged to upper middle and lower middle class and around 63 per cent of the drug addicts were residing in the urban areas. 75 per cent of the substance users were unemployed and semi-skilled and about 42 per cent had studied between high and senior secondary school education.

The substance use determinants such as type of substance use, less than 3 types of substance use, number of relapse, fear of legal action, family history, single parent, peer pressure and the duration of substance use have been illustrated in table 2. The table inferred that about 60 per cent of the substance users had the addition of cannabis and about 38 per cent had it for chitta (a synthetic opioid of recent emergence). Only 2 per cent of the substance users were consuming tobacco and alcohol. It was also
found that around 54 per cent of the users were consuming less than 3 types of substance. It was observed that more than two episodes of relapse had been experienced by more than 80 per cent of substance users. About 62 per cent of the users had the fear of legal action. Around 44 per cent of drug addicts had no family history of the substance use. It was also evinced that 39 per cent of respondents had only single parent and about 54 per cent had started substance use under peer pressure. Duration of substance use of about 60 per cent of drug addicts varied between 6 to 24 months.

Table 1: Demographic features of drug addicts (n=750).

| Parameters             | Mean (SD) | Range |
|------------------------|-----------|-------|
| Age                    | 31 (9)    | 13-62 |
| Gender frequency percent |           |       |
| Female                 | 81        | 10.80 |
| Male                   | 669       | 89.20 |
| Marital status         |           |       |
| Single                 | 236       | 31.47 |
| Married                | 495       | 66.00 |
| Divorced               | 19        | 2.53  |
| Socio economic status  |           |       |
| Upper                  | 64        | 8.53  |
| Upper middle           | 191       | 25.47 |
| Lower middle           | 305       | 40.67 |
| Upper lower            | 164       | 21.87 |
| Lower                  | 26        | 3.47  |
| Locality               |           |       |
| Urban                  | 470       | 62.67 |
| Rural                  | 280       | 37.33 |
| Occupation             |           |       |
| Student                | 96        | 12.8  |
| Unemployed             | 351       | 46.8  |
| Semi-skilled           | 223       | 29.73 |
| Skilled                | 67        | 8.93  |
| Home-maker             | 13        | 1.73  |
| Educational status     |           |       |
| Illiterate             | 25        | 3.33  |
| Under matric           | 262       | 34.93 |
| 10-12th                | 317       | 42.27 |
| Graduate and post graduate | 146  | 19.47 |

Table 3A and 3B infer the substance use wise detail of demographic features and the substance use characteristics (n=750). The table illustrated that age range of the all the substance users was very wide and maximum female respondents were consuming alcohol (100%) followed by chitta (17%) which varied significantly. Statistically significant 27 per cent of chitta and 35 per cent of cannabis users were single and there was also dominance of the lower middle class in all the substance use categories except for alcohol. Most of the substance users were residing in the urban area (p<0.001). However, statistically significant 48 per cent of cannabis users were from rural background. 28 to 50 percent of the substance users of all types were the semi-skilled persons and more than half of cannabis users were unemployed (p<0.001). Educational profile wise observations inferred statistically significant 28 per cent of chitta users being the graduates of various study streams.

Table 2: Description of the pattern and the determinants of substance use in Solan (2019).

| Characteristic                  | Frequency | Percent |
|---------------------------------|-----------|---------|
| Substance use                   |           |         |
| Chitta                          | 288       | 38.40   |
| Cannabis                        | 450       | 60      |
| Tobacco                         | 10        | 1.33    |
| Alcohol                         | 2         | 0.27    |
| Less than 3 type of substance   |           |         |
| Yes                             | 403       | 53.73   |
| No                              | 347       | 46.27   |
| Number of relapse               |           |         |
| 1                               | 148       | 19.73   |
| 2                               | 302       | 40.27   |
| 3                               | 279       | 37.2    |
| 4                               | 21        | 2.80    |
| Fear of legal action            |           |         |
| Yes                             | 461       | 61.47   |
| No                              | 289       | 38.53   |
| Family history                  |           |         |
| Yes                             | 424       | 56.53   |
| No                              | 326       | 43.47   |
| Single parent                   |           |         |
| Yes                             | 291       | 38.80   |
| No                              | 459       | 61.20   |
| Peer pressure                   |           |         |
| Yes                             | 407       | 54.27   |
| No                              | 343       | 45.73   |
| Duration of substance use       |           |         |
| ≤ 6 months                      | 93        | 12.40   |
| 6 to 12 months                  | 237       | 31.60   |
| 1 to 2 years                    | 219       | 29.20   |
| 2 to 5 years                    | 146       | 19.47   |
| >5 years                        | 55        | 7.33    |

These substance users were not restricted to one or two substance use as it was clear from the table that only half of the population of chitta and cannabis addicts were consuming less than three substances which was significantly different from other as p<0.01. It was also observed that more than 50 per cent of respondents from all substance use had experienced more than one relapse and the cannabis users (about 89%) had experienced the maximum relapses significantly. Seventy four per cent of the chitta addicts significantly had the fear of legal action and around 63 per cent had family history of substance use also (p<0.05). Half of the respondent of tobacco and alcohol only had a single parent and 70 per cent of
tobacco addicts had experienced the peer pressure too. A significant proportion of substance users (36 and 100 per cent of chitta and alcohol respectively) had abused these substances for 6 to 12 months and another 29 per cent of cannabis and 50 per cent of tobacco users had abused them for about 1 to 2 years (p<0.1).

Table 3A: Substance use wise description of demographic features of the users.

| Substance use (number of respondents) | Mean age (range) | Female (%) | Marital status | Socio-economic status | Locality | Occupation | % graduate and above |
|--------------------------------------|-----------------|------------|----------------|----------------------|----------|------------|----------------------|
| Chitta (288)                         | 32 (14-56)      | 17         | 27% single     | Lower middle: 37%, upper middle: 35% | 79% urban | 39% unemployed, 33% semi-skilled | 28        |
| Cannabis (450)                       | 31 (13-62)      | 5          | 35% single     | Lower middle: 43% | 52% urban | 48% rural | 52% unemployed, 28% semi-skilled | 14        |
| Tobbacco (10)                        | 36 (21-61)      | 70         | 80% married    | Lower middle: 60%, upper middle: 40% | 90% urban | 30% unemployed, 30% semi-skilled | 20        |
| Alcohol (2)                          | 46 (32-60)      | 100        | 100% married   | Upper middle: 100% | 100% urban | 50% semi-skilled, 50% skilled | Nil       |
| Chi-square (p value)                 | 77.15 (0.000)   | 8.32       | 66.96 (0.000)  | 60.25 (0.000) | 47.45 (0.000) | 74.16 (0.000) |

Table 3B: Substance use wise description of demographic features of the users.

| Substance use (number of respondents) | Proportionate population consuming less than 3 substance use | % population experiencing more than one relapse | % population having fear of legal action | % population having family history | % population only have single parent | % population only having experienced any peer pressure | Proportionate population and Duration of substance use |
|--------------------------------------|-------------------------------------------------------------|-----------------------------------------------|----------------------------------------|-------------------------------------|-------------------------------------|------------------------------------------------------|------------------------------------------------------|
| Chitta (288)                         | ½                                                           | 67.71                                         | 74                                      | 63                                  | 39                                  | 52                                                   | 36%: 6-12 months                                      |
| Cannabis (450)                       | ½                                                           | 88.67                                         | 53                                      | 54                                  | 39                                  | 56                                                   | 29%: 1-2 year                                        |
| Tobacco (10)                         | 1/10                                                        | 70                                            | 60                                      | 40                                  | 50                                  | 70                                                   | 50%: 1-2 year                                        |
| Alcohol (2)                          | Nil                                                         | 50                                            | 50                                      | Nil                                 | 50                                  | Nil                                                  | 100%: 6-12 months                                    |
| Chi-square                           | 12.89 (0.005)*                                             | 89.34 (0.000)                                 | 32.73 (0.000)                          | 11.35 (0.01)                        | 0.64 (0.886)                         | 4.22 (0.238)                                         | 20.09 (0.06)                                        |

*Figures in parentheses indicates p values.

Table 4A and 4B depicted the description of cluster membership using Ward’s algorithms. Of the 4 clusters, several described groups of patients with substance use such as cannabis, chitta, alcohol and tobacco. Results revealed that cluster I and II was dominated by young population as compared to other with higher percentage of male and female respectively. In respect of marital status, cluster I, III and IV comprised of substance users who were married and cluster II had significant number of unmarried persons. It was also evinced that mostly married population was found in all the clusters with more than 80 per cent except for cluster II which was dominated by singles with 69 per cent of the population. Lower middle class was found dominated in all clusters except for cluster IV. Cluster membership was also significantly influenced by locality (p<0.05) and occupation (p<0.01) of the population. In cluster III and IV, less than 30 per cent of the users lived in the urban areas. Main occupation of the users also varied among different clusters with highest 47 per cent of student population in cluster II. Education status indicated that more than 24 per cent of the graduates were found in cluster II and III. More than 50 per cent of the population of cluster I, III and IV were consuming more than 3 substances.
Table 4A: Description of subgroups of patients through cluster analysis using Ward’s Minimum variance method.

| Cluster | Number of patients | Mean age (Range) | Proportionate male (M) and female (F) between clusters | Dominance of marital status within cluster | Socio-economic status with-in cluster | % urban population with-in cluster |
|---------|--------------------|-----------------|------------------------------------------------------|-------------------------------------------|---------------------------------------|----------------------------------|
| I       | 311                | 31 (27,35)      | 42.45M, 33.33F                                      | 80% married                               | Lower middle (40%) and upper lower (25%) | 40%                              |
| II      | 246                | 22 (13, 26)     | 32.59M, 34.57F                                      | 69% single                                | Lower middle (41%) and upper middle (26%) | 40%                              |
| III     | 40                 | 53 (47, 62)     | 5.08M, 7.41F                                       | 90% married                               | Lower middle (48%) and upper middle (23%) | 28%                              |
| IV      | 153                | 40 (36, 46)     | 19.88M, 24.69F                                     | 88% married and most divorced            | Upper middle (25%) and lower middle (20%) | 29%                              |

Chi-square (p value) 3.09 (0.378) 268.25 (0.000) 8.93 (0.709) 9.5 (0.034)

Table 4B: Description of subgroups of patients through cluster analysis using Ward’s Minimum variance method.

| Cluster | Occupation between cluster | % graduate and above | Proportionate population consume less than 3 substance use | % population more than one relapse | % population only have single parent | Substance use |
|---------|----------------------------|----------------------|----------------------------------------------------------|-----------------------------------|-------------------------------------|---------------|
| I       | 44 % Semi-skilled          | 17%                  | ½                                                       | 81                                | 40                                  | 63 % Cannabis |
| II      | 47 % Students              | 24%                  | 3/5                                                     | 85                                | 37                                  | 64 % Cannabis |
| III     | 10% Skilled                | 28%                  | 2/5                                                     | 73                                | 55                                  | 50 % Chitta   |
| IV      | 46 % Home makers           | 16%                  | ½                                                       | 74                                | 34                                  | 52 % Cannabis and 46 % Chitta |

Chi-square (0.004)* 13.48 (0.142) 4.57 (0.206) 17.47 (0.004) 6.37 (0.095) 18.67 (0.028)

*Figure under parentheses indicates p values

Number of relapse was one the key characteristics of the cluster membership which indicated that more than 80 per cent of the users had experienced more than one relapse in their lifetime. In the cluster III, more than 50 per cent of the users were having a single parent. Among different clusters, consumption of the substance use was also found significant (p<0.05) with maximum 50 per cent of chitta users in the cluster III. Cannabis use was dominant in the cluster I and II with 63 and 64 per cent, respectively. In cluster IV, both cannabis and chitta were being consumed by 52 and 46 per cent of the users, respectively.

**DISCUSSION**

The present study inferred the young age, primarily the males and those who were unemployed were the ones abusing one or the other type of substance. Abuse of cannabis and chitta was observed more in the substance users as compared to the consumption of tobacco and alcohol. The youth getting involved in these practices and high cost of opioids is an area of concern in Indian context as the young population forms the major chunk of total population and that the poverty is already prevalent in the country. The present study also evinced that in the context of alcohol usage, all the females were consuming it. Again keeping in view the prevalent poor reproductive and child health status in India, the women folk getting into alcohol abuse is alarming. Similar high usage of alcohol has also been documented in studies by Erol et al and Hoggatt et al.12,13

Cannabis and chitta was being used more by unmarried persons and those belonging to lower middle class. Bhat et al. also has reported the higher abuse of the opioids in the unmarried persons and persons belonging to lower socio economic strata.14 Similar findings have been reported by Warrington et al.15 Strangely chitha was also being abused by persons who were well educated. Bonyani et al. also documented in their study the higher
use of opioids amongst the persons who were highly educated.16

Abusers of alcohol were predominantly residing in urban areas whereas the cannabis was being consumed more in rural areas. The rural economy is a major contributor in India’s development. But with the growing menace of cannabis, it may gradually be getting weaker. Williams et al.17 also reported the higher use of such substance in the rural background. The present study had inferred that almost half of the substance users were having no family history of substance use and had the fear of legal consequences of this malpractice but still were abusing more than 3 types of substance at a time. Single parenting and peer pressure also determined the substance use. Majority of the substance users had experience for than two relapses in their lifetime. Similar social determinants of health affecting substance use has been studied by Bessie et al, Siddike et al.18,19 The cluster analysis employed in the present study has elaborated the substance specific social determinants leading to its misuse. This can in future provide us the pinpoint approach for planning interventions for taking care of these determinants.

CONCLUSION

Cluster analysis is data mining technique which was used to identify discrete group of substance users with specific combinations of type of substance being used. These clusters help to develop the specific strategy for each cluster by de-addiction centres aiming at improving health of the drug users.

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REFERENCES

1. Roth GA, Abate D, Abate KH, Abay SM, Abbafati C, Abha N, Abdollahpour I. Global, regional and national age–sex-specific mortality for 282 causes of death in 195 countries and territories, 1980-2017: a systematic analysis for the Global Burden of Disease Study 2017. The Lancet 2018;392:1736-88.
2. Huertas E, Lopez-Moreno JA, F Vanessa, Echeverry-Alzate V, Buhler K-M. Association between experimental substance use, FAAH-gene variations, impulsivity and sensation seeking. Psychotem 2019;31:239-45.
3. Bidwell LC, Metrik J, McGearly J, Palmer RH, Francazio S, Knopik VS. Impulsivity, variation in the cannabinoid receptor (CNR 1) and fatty acid amide hydrolase (FAAH) genes, and marijuana related problems. Journal of studies on alcohol and drugs 2013;74:867-78.
4. Palmer RH, McGearly J, Knopik VS, Bidwell LC, Metrik JM. CNR1 and FAAH variation and affective states induced by marijuana smoking. The American Journal of Alcohol and Drug Abuse 2019;45:514-26.
5. Evren C, Cinar O, Evren B, Celik S. History of suicide attempt in male substance-dependant inpatients and relationship to borderline personality features, anger, hostility and aggression. Psychiatry Research 2011;190(1):126-31.
6. Evren C, Cinar O, Evren B, Ulku M, Karabulut V, Umut G. The mediator roles of trait anxiety, hostility and impulsivity in the association between childhood trauma and dissociation in male substance-dependant inpatients. Comprehensive Psychiatry 2013;54(2):158-66.
7. Acton GS. Measurement of impulsivity in a hierarchical model of personality traits: implications for substance use. Substance use and misuse 2003;38(1):67-83.
8. Hamdan-Mansour AM, Mahmoud KF, Al Shibi AN, Arabiat DH. Impulsivity and sensation-seeking personality traits as predictors of substance abuse among university student. Journal of psychosocial nursing and mental health services 2018;56.
9. Ambekar A, Agrawal A, Rao R, Mishra AK, Khandelwal SK, Chadda RK. National Survey on Extent and Pattern of Substance Use in India. Magnitude of Substance Use in India. New Delhi: Ministry of Social Justice and Empowerment, Government of India. Available at: https://www.socialjustice.nic.in/writereaddata/Uploa dFile/Survey%20Report%36935330086452652.pdf. Accessed on 02nd July 2020.
10. Crime in India 2018 Statistics:1: National Crime Record Bureau. New Delhi, Ministry of Home Affairs, Government of India. Available at: https://www.ncrb.gov.in/sites/default/files/Crime%2 0in%20India%202018%20-%20Volume%201.pdf. Accessed on 02nd July 2020.
11. Micro, Small & Medium Enterprises Development Institute. Brief Industrial profile of Solan District. Government of India. Ministry of MSME. 2014-15. Available at www.msmedihimachal.nic.in
12. Erol A, Karpayak VM. Sex and gender related differences in alcohol use and its consequences: contemporary knowledge and future research considerations. Drug and Alcohol Dependence 2015;156:1-13.
13. Hoggatt KJ, Jamison AL, Lehavot K, Cucciare MA, Timko C, Simpson TL. Alcohol and drug misuse, abuse, and dependence in women veterans. Epidemiological Reviews 2015;37:23-37.
14. Bhat BA, Dar SA, Hussain A. Sociodemographic profile, pattern of opioid use, and clinical profile in patients with opioid use disorders attending the deaddiction center of a tertiary care hospital in North India. Indian Journal of Social Psychiatry 2019;35:173-178.

15. Warrington JS, Lovejoy N, Brandon J, Lavoie K, Powell C. Integrating social determinants of health and laboratory data: a pilot study to evaluate co-use of opioids and benzodiazepines. Academic Pathology 2019;6:2374289519884877.

16. Bonyani A, Safaian L, Chehrazi M, Etidali A, Zaghian M, Mashhadian F. A high-school based education concerning drug abuse prevention. Journal of Education and Health Promotion 2018;7:88.

17. Williams N, Bossert N, Chen Y, Jaanimagi U, Markatou M, Talal AH. Influence of social determinants of health and substance use characteristics on persons who use drug pursuit of care for hepatitis C virus infection. Journal of Substance abuse treatment 2019;102:33-9.

18. Bessie Ng, Kaur J, Ramjoo SK. Understanding the determinants of substance misuse. Region of peel. Peel Public Health 2018;905-791-7800:1-59.

19. Siddike PAS, Soron TR, Ahmed HU, Chowdhury CA. Social and family determinants of substance abuse among the patients of two hospitals in Bangladesh. Journal of Addiction Research and Therapy 2017;8:340.

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