

ORIGINAL PAPER

Nutritional Status and its Relationship with Substance use Behavior among Adolescents Slum dwellers of Guwahati

Bardhan Tanusri¹, Saikia Anku Moni², Baruah Rupali³

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ABSTRACT

Purpose: Substance use poses a serious threat to the nutritional status of growing adolescents. Thus the study was conducted to assess the nutritional status of adolescent substance users living in the slums of Guwahati city and to evaluate the relationship between nutritional status and substance use behaviour. **Methods:** A cross-sectional study was conducted from 1st February till 31st May 2014. Using the prevalence of substance use as 43.4%, absolute precision of 7% and design effect of 2, sample size was calculated as 401. Cluster sampling method was used to select 23 slums. From each slum, 18 adolescents (9 boys and 9 girls) were interviewed to get a total of 414 study subjects. For nutritional assessment, 24-hour dietary recall, Body Mass Index, and haemoglobin estimation was done. Data was analysed using SPSS 16.0. **Results:** Overall prevalence of substance users was 37.7% and current users was 35.0%. Anaemia was found to be significantly associated with substance use status. However, relationship between BMI, calorie deficit and substance use status was not found to be statistically significant. **Conclusion:** Relationship of anaemia with substance use behaviour invites more evidence based research for effective intervention. However, a temporal association could not be established between the two.

Keywords: Nutritional Assessment, Substance User, Anaemia, Slum Dweller

INTRODUCTION

Substance use has been a menace throughout the world for many centuries. Substance is defined as 'any substance, whether natural or artificial in origin, which when taken into the body in sufficient quantities, exerts a non-negligible effect on a person's perception, cognition, emotion, and/or behavior'.¹ As per ICD-10, substances include tobacco and its products, alcohol, opioids, cannabinoids, volatile solvents, hallucinogens, sedatives, cocaine, other stimulants and psychoactive substances.² Substance use is a life-style and behavioral problem that can lead to social and public health problems, and adolescents seem to be the most vulnerable group to become an easy prey. Adolescence is a critical phase characterized by great physical, physiological, psychological and social changes. During adolescence, individuals typically experiment with a wide range of behaviours and life style patterns. They tend to develop a sense of autonomy, freedom and try to establish a personal identity. The problem of substance use is worst in the slums due to the various environmental factors.

Address for correspondence and reprint:

¹Post-graduate trainee (**Corresponding Author**)

Email: tanubrdhn@gmail.com

Mobile: 8473803522

²Associate Professor, Gauhati Medical College, Guwahati, Assam-781032

³Professor and Head of the department of Community Medicine

Gauhati Medical College, Guwahati, Assam-781032

People using substances experience a wide array of physical effects, one of them being the nutritional problems, more specifically the nutritional deficiencies. Many studies on addicts have demonstrated nutritional deficiencies, including weight loss and changes in dietary patterns though the results are variable.³⁻¹⁰ Factors that could explain the discrepancies among these studies include differences in the types, duration and frequency of substances used. Although nutrition is a multidimensional subject, the influence of abusive substances on the nutritional status during the growth spurt period of adolescence is a matter of concern.

Studies are limited in this regard that evaluates the nutritional status of substance users especially the community based ones. With this background the present study was conducted with the objectives of assessing the nutritional status of adolescent substance users living in the slums of Guwahati city and evaluating the relationship between nutritional status and substance use behaviour.

METHODS

Study Design: Community based cross-sectional study.

Study Area: Slums of Guwahati city, Assam. According to Guwahati Development Department, Government of Assam (2009), there are 90 notified slums in Guwahati city with an approximate total population of 167796, spread over 31 municipal wards encompassing 27966 households approximately.¹¹

Study Population: Adolescents (10-19 years), both males and females residing in the slums.

Inclusion Criteria: All adolescents (10-19 years), both males and females residing in the slums for last six months and consenting to the interview.

Exclusion criteria: Critically ill adolescents.

Study Period: 1st February till 31st May 2014.

Sample size and Sampling: Using the prevalence of substance use among adolescents as 43.4%,¹² absolute precision of 7% and confidence interval of 95%, sample size was calculated as 200.5, applying the formula, $n = 4pq/L^2$. Considering a design effect of 2, the sample size

came out to be 401. From the total 90 notified urban slums in Guwahati city, 1/4th, i.e., 23 slums were selected by cluster sampling method. For the selection of desired clusters PPS (Population Proportionate to Size) method was applied. From each slum, equal number of boys and girls were taken (18 adolescents, 9 boys and 9 girls) to get a total of 414 study subjects.

Data Collection Tools: Predesigned and pretested schedule, electronic weighing scale, measuring tape, hemocek kit.

Data Collection Technique: House to house visit was made. The first household in each slum was selected at random one all the adolescents fulfilling the inclusion criteria were interviewed from the house and the data were recorded using a predesigned and pretested schedule, and moved on to the next house in search of the subsequent respondents. If the required number of sample units was not met in that slum, then the adjacent slum was taken to get the remaining sample units. Beforehand an adequate rapport was built up with the community/opinion leaders and family members of the subjects by carefully briefing the purpose of the study. Nutritional assessment was done by 24-hour dietary recall, calculating Body Mass Index and hemoglobin estimation using Hemocek Kit (100 randomly selected respondents, 50 among substance users and 50 among non-users).

Data was analyzed using SPSS 16.0 (SPSS Inc. Chicago). Ethical Clearance was obtained from the Institutional Ethics Committee. Written and informed consent was obtained from the study participants/their guardians.

Operational Definition:

Never User: The respondent, who has not taken any of the substances ever in life, or who used fewer than 10 times in his/her entire lifetime.

Ever User: The respondent, who accepts having taken one or more substances in his/her lifetime for more than 10 times, may continue to take or has given up taking. This is further classified as current user and ex-user.

Current User: The respondent, who has taken substance(s) for more than 10 times in his/her lifetime and is currently using them during the past one month.

Ex-user: The respondent, who has taken substance(s) for more than 10 times in his/her lifetime, but has given up using for at least the last one month.

OBSERVATIONS AND RESULTS

The prevalence of ever users was found to be 37.68% and that of current users was 35.02% and ex-users was 2.68%. While assessing the nutritional status and evaluating the relationship between nutritional status and substance use behaviour, only the current users were considered and the ex-users were excluded. **Table 1** shows the distribution of adolescents according to their Body Mass Index.

Table 1 Distribution of Mass Index

Body Mass Index (kg/m ²)	Boys (%)	Girls (%)	Total (%)
<18.5	78 (39.00)	159 (78.33)	237 (58.81)
18.5 – 24.9	109 (54.50)	40 (19.70)	149 (36.97)
>24.9	13 (6.50)	4 (1.97)	17 (4.22)
Total	200 (100.00)	203 (100.00)	403 (100.00)

The prevalence of under-nutrition among the current users were 62.07% as compared to 56.98% among the never users. However, the relationship between BMI and substance use behavior was not found to be statistically significant ($p = 0.4663$) as shown in **Table 2**.

Table 2 Relationship between BMI and substance use status

BMI (kg/m ²)	Current user	Never user	Total
< 18.5	90 (62.07)	147 (56.98)	237 (58.81)
18.5-24.9	48 (33.10)	101(39.15)	149 (36.97)
>24.9	7 (4.83)	10 (3.87)	17 (4.22)
Total	145(100.0)	258(100.0)	403 (100.0)

$\chi^2 = 1.526$, $df = 2$, p -value = 0.4663

The mean calorie deficit among the current users was 845.34 (± 156.46) kcal/day (**Table 3**).

Out of the 100 randomly selected study subjects, majority (51%) of the adolescents had 10-12 gm/dl of hemoglobin, 28% had less than 10 gm/dl and only 21% had normal hemoglobin status (more than 12 gm/dl). The mean hemoglobin among current users was 10.46 (± 1.216) gm/dl in comparison to 11.18 (± 1.612) gm/dl among the never users (**Table 3**) and the association between the hemoglobin status and substance use behavior was found to be statistically significant ($p < 0.05$).

Table 3 Relationship between mean Hb status and mean calorie deficit with substance user status

Variables	Current user	Never user	t-value	df	p-value
Mean Hb (SD) (gm/dl)	10.46 (± 1.216)	11.18 (± 1.612)	2.521	98	0.0133
Mean Calorie deficit (SD) (kcal/day)	845.34 (± 156.46)	822.32 (± 171.23)	1.335	401	0.1825

DISCUSSION

The overall prevalence of substance users was 37.68% and that of current users was 35.02% and ex-users was 2.68%. Kokiwar PR and Jogdand GS found 32.7%,¹³ Sarangi L *et al* found 43.4%,¹² whereas Benegal V *et al* found the prevalence of substance use even higher.¹⁴ This variation could be attributed to inclusion of equal numbers of males and females in the present study.

From **Table 1**, it was seen that majority (54.50%) of the boys had BMI of 18.5-24.9 kg/m² whereas 78.33% girls had BMI of <18.5kg/m². While eliciting the relationship between BMI and substance use status (table 2), it was found that majority of the current users (62.07%) had BMI of < 18.5 kg/m², also most of the never users (56.98%) had BMI of < 18.5 kg/m². But this relationship was not statistically significant. Also, no temporal relationship could be established between the two. However, Islam NSK *et al* observed significantly low BMI ($p < 0.001$) among the drug addicts.³ Karajibani M *et al* studied the BMI of drug users in a treatment centre in Zahedan, Iran and results showed that 40.4% men and 0% women were wasting; 21.3% men and 14.3% women were at risk of wasting; 34.1% men and 57.1% women were of normal weight; and 4.2% men and 28.6% women were overweight.⁴ Ross LJ *et al*, also found a significant relationship between BMI and substance use status.⁶

Only 21.0% adolescents had more than 12 gm/dl of hemoglobin. **Table 3** reveals that the mean hemoglobin for the current users and the never users were 10.46 (± 1.216) gm/dl and 11.18 (± 1.612) gm/dl respectively. And this difference between the two groups according to their hemoglobin status was found to be statistically significant ($p < 0.05$). However, no temporal relationship could be established. Islam NSK *et al* conducted a study to assess the nutritional status of drug addicts undergoing detoxification at Central Drug Addiction Treatment

Hospital, Dhaka in 1999, which revealed the drug addicts had significantly ($p < 0.001$) lowered hemoglobin.³ Subramoney S and Gupta PC found that smokeless tobacco use during pregnancy influenced hemoglobin levels in a population-based cohort of 918 pregnant women in Mumbai, India. Mean hemoglobin levels were significantly lower in users (10.00 g/dl) compared with non users (10.46 g/dl), ($p < 0.000$).¹⁵

Also, the present study reveals no statistically significant difference in mean calorie deficit among current users and never users (**Table 3**). However, various studies found low calorie intake among the drug addicts.⁶⁻⁷ Such findings in our study could be attributed to the fact that a small sample of the adolescents was included and also the users were using different substances for varying duration and amount. Son SM *et al* found no significant difference of BMI by smoking status even though the smokers showed significantly lower carbohydrate intake and tendency of lower energy intake.¹⁶

LIMITATION

One of the important limitations of the study is the small sample size. Also, nutritional deficits as reported among the substance users could not be attributed to the substance use behaviour as the temporality could not be established between the two, and also the factors like type of the substance being used, amount, frequency and duration of the substance use could have influenced the results. Similarly, the influence of co-morbidities on the study results could not be excluded.

CONCLUSION

The significant relationship between anaemia with substance use behaviour as found in the present study invites more evidence based research for effective intervention as this is an important point in dealing with the problems of malnutrition among the adolescent age group. Prospective studies with larger sample size in this regard might further help in probing into the issue in its depth.

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Conflict of interest: No conflict of interest associated with this work.

Ethical clearance: Taken

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