Behavioural and anthropometric risk factors of non communicable diseases: Experience from secondary students of a rural school of south 24th Parganas, West Bengal

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ABSTRACT
Descriptive school based study was conducted to assess behavioural risk factors and anthropometric risk factors among the Secondary students of selected rural school of South 24th parganas, West Bengal. Total 270 students including boys and girls from class IX and class X were selected by convenient sampling technique. The data were collected through questionnaire based on WHO STEP approach. The behavioral risk factors considered under the study were tobacco use, alcohol consumption, physical inactivity, unhealthy diet. Anthropometric risk factors were measured through assessment of abdominal obesity and overweight. Study showed 12.7 boys were currently smoking tobacco and 3.46% boys consumed alcohol within past 12 months; 16.29% and 29.6% students consumed fruits and vegetables regularly, 28.8% students were skipping breakfast frequently, 35.5% students used to consume fast food 3 days or more in a week and 27% students were physical inactive. Only 16.18 boys and 18.55 girls were overweight (BMI > 25 kg/m²); Abdominal obesity was prevalent among 12.71% boys and 21.54% girls.

Keywords: Behavioural risk factors, Anthropometric risk factors, Tobacco use, Alcohol, Physical inactivity, Unhealthy diet.

INTRODUCTION:
The increasing prevalence of non-communicable disease risk factors in rural areas has important public health implications, two-thirds of India's one billion population still lives in rural areas[1] Rural populations have limited access to healthcare and can ill afford to pay the high treatment costs associated with chronic conditions. Targeting the risk factors for non-communicable diseases is recognized as an essential preventive strategy. Several surveys have examined the prevalence of risk factors for non-communicable diseases in urban India [2,3,4]
The Government of India has also included surveillance of the risk factors of non-communicable diseases (NCDs) in the Integrated Disease Surveillance Project. Monitoring these risk factors over a period of time would be useful to make an indirect assessment of the actual disease burden.
OBJECTIVES OF THE STUDY

- To identify the behavioral risk factors among the secondary students
- To identify the anthropometric risk factors among the secondary students
- To find out the association between behavioral & anthropometric risk factors

MATERIALS & METHODS

A Descriptive cross sectional design was carried out among the students studied in class IX, and X at Kheadaha High school of Sonarpur south 24th Pargnas, West Bengal. Data was collected during the month of March 2017. Prior to data collection ascent was obtained from participants and informed consent obtained from parents. The data was collected through questionnaire based on WHO STEP approach. The questionnaire was prepared in Bengali language. The behavioral risk factors considered under the study were tobacco use, alcohol consumption, physical inactivity, unhealthy diet. Anthropometric risk factors were measured through assessment of abdominal obesity and overweight.

Operational definition:

Tobacco use: smoking bidi, cigarettes or using chewable products like Guthka, Khaini, Zarda Pan
Alcohol: consuming alcohol within past one year
Physical inactivity: less than 10 mins of activity at a stretch during work, leisure or transport
Unhealthy diet: not regular intake of fruits and vegetables, skipping breakfast frequently, taking fast food 3 days or more in a week
Abdominal obesity: waist circumference is greater & equal to 90 cm in boys and greater & equal to 85 cm in girls

Sample & sampling technique

The students were selected by total enumeration technique and conveniently samples were selected. The sample size was 270 comprising both sexes.

Sampling criteria:

The students who were willing and was present in the class
Whose parents give consent
Residing at home only. Hostellers were excluded

Data collection tools

The data was collected through questionnaire based on WHO STEP approach. The behavioral risk factors considered under the study were tobacco use, alcohol consumption, physical inactivity, unhealthy diet. The questionnaire was prepared in Bengali language. Language validity established and reliability was established by test retest method. Anthropometric risk factors were measured through assessment of abdominal obesity and overweight and recorded in physical assessment proforma. Weighing machine and stadiometre were calibrated before starting the measurement and recalibrated after the 10 measurements.

RESULTS:

The present study sample comprised of 55.55% students studied in class IX, 44.45% students studied in class X. Out of total sample, 56% students were adolescent boys & 44% students were adolescent girls. Most of the students (82%) belonged to Hindu religion. Education level was higher among the fathers of the students compared to mothers. Only 37% students mother were educated secondary & above whereas 45% students father were educated secondary & above.
### Table 1 Distribution of the study population by behavioral and anthropometric risk factors

N= 270

<table>
<thead>
<tr>
<th>Sl no</th>
<th>Risk factors</th>
<th>Boys (n= 173)</th>
<th>Girls (n= 97)</th>
<th>Total</th>
<th>Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Currently smoking tobacco daily</td>
<td>12</td>
<td>Nil</td>
<td>12</td>
<td>4.4</td>
</tr>
<tr>
<td>2.</td>
<td>Ever smoking daily but now quitted</td>
<td>5</td>
<td>Nil</td>
<td>5</td>
<td>1.9</td>
</tr>
<tr>
<td>3.</td>
<td>Currently use smokeless tobacco</td>
<td>34</td>
<td>8</td>
<td>42</td>
<td>15.5</td>
</tr>
<tr>
<td>4.</td>
<td>Currently taking alcohol daily</td>
<td>Nil</td>
<td>NIL</td>
<td>NIL</td>
<td>NIL</td>
</tr>
<tr>
<td>5.</td>
<td>Everyday eating fruits</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>7 days/ week</td>
<td>12</td>
<td>32</td>
<td>44</td>
<td>16.3</td>
</tr>
<tr>
<td></td>
<td>4 – 6 days/ week</td>
<td>14</td>
<td>32</td>
<td>46</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>Less than 3 days/ week</td>
<td>147</td>
<td>33</td>
<td>180</td>
<td>66.7</td>
</tr>
<tr>
<td>5.</td>
<td>Everyday eating vegetables</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>7 days/ week</td>
<td>55</td>
<td>25</td>
<td>80</td>
<td>29.6</td>
</tr>
<tr>
<td></td>
<td>4 – 6 days/ week</td>
<td>75</td>
<td>45</td>
<td>120</td>
<td>44.5</td>
</tr>
<tr>
<td></td>
<td>Less than 3 days/ week</td>
<td>40</td>
<td>27</td>
<td>67</td>
<td>24.9</td>
</tr>
<tr>
<td>6.</td>
<td>Consumed extra salt most often with meal</td>
<td>69</td>
<td>40</td>
<td>109</td>
<td>40.3</td>
</tr>
<tr>
<td>7.</td>
<td>Skipping breakfast frequently</td>
<td>48</td>
<td>30</td>
<td>78</td>
<td>28.9</td>
</tr>
<tr>
<td>8.</td>
<td>Fast food consumption &gt; 3 days/ week</td>
<td>58</td>
<td>38</td>
<td>96</td>
<td>35.5</td>
</tr>
<tr>
<td>9.</td>
<td>Physically inactive ( not doing atleast 10 mins moderate to vigorous physical activity in leisure time )</td>
<td>30</td>
<td>42</td>
<td>72</td>
<td>26.7</td>
</tr>
</tbody>
</table>

**Behavioral risk factors**: Among the boys, 12.7% (22 students out of 173 boys) students were currently smoking tobacco among them 55% used daily (12 students out of 22). No girls were smoking tobacco. Among the non-smoker boys, only 3.31% ever smoked (5 boys out of 151) and only 2% girls ever smoked (2 girls out of 97). 19.65% boys were currently using smokeless tobacco and 8.24% girls were currently using smokeless tobacco; most commonly used smokeless tobacco was khaini followed by zarda. Among the boys 3.46% (6 boys) consumed alcohol within past 12 months whereas no girls consumed alcohol. Out of all students, 16.3% and 29.6% students consumed fruits and vegetables regularly but more girls consumed fruits and vegetables regularly than the boys. Always to often 40% students consumed extra salt with food. 28.8% students were skipping breakfast frequently. 35.5% students used to consume fast food 3 days or more in a week. Among them girls were tend to consume more fast food than boys. 27% students were physical inactive and among them girls were more physically inactive than boys.

![Figure 1](Chart.png)

**Figure 1** Anthropometric risk factors for participants
**Anthropometric risk factors**: only 16.18 boys and 18.55 girls were overweight (BMI > 25 kg/m²); Abdominal obesity was prevalent among 12.71% boys and 21.54% girls

Overweight was significantly associated with physical inactivity and less fruits & vegetables consumption ($\chi^2 = 4.2, df = 1, p < .05$ respectively) & abdominal obesity was significantly associated with physical inactivity and less fruits & vegetables consumption ($\chi^2 = 5.1, df = 1, p < .05$ respectively)

**CONCLUSION**

One of the limitations of our study was that, inclusion of trans-fat consumption, in the form of deep fried food (like pakoras etc.), local bakery biscuits, cakes, and extra saturated fat in the form of ghee, butter, and vanaspati, in the questionnaire, would have been more relevant. Overall, these observations suggest behavioural risk factors are prevalent mostly in dietary habit & physical activity aspects. Monitoring of risk factors for non-communicable diseases (NCDs) over a period of time would be useful to make an indirect assessment of the actual disease burden. Adolescence period is the crucial period when lifestyle modification can be started and health habits for the adult life could be initiated.

**REFERENCES**