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Life-style risk factors among school adolescents in a city of North East India: A cross-sectional study.

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Abstract:

Background: *The rising burden of lifestyle risk factors for non-communicable disease among adolescents is a major public health problem worldwide.* ***Objectives****: 1. To estimate the prevalence of lifestyles risk factors among school adolescents 2. To determine the role of gender on lifestyles risk factors. 3. To study the association of lifestyle risk factors with high Body Mass Index (BMI) status.* ***Methodology****: This Cross sectional study was conducted among school going adolescents of three randomly selected schools of Agartala. Multistage stratified random sampling procedure was adopted and information was collected using global school based student health survey and Physical Activity Questionnaire for Adolescents.* ***Results****: The study showed that majority of the students were involved in moderate physical activity (73.6%) followed low physical activity (25%). The physical activity level was high among males compared to females (p value-0.00). The prevalence of tobacco and alcohol use was 5.5% and 2.8% respectively. Regarding dietary habit, 42.1% adolescent students had poor dietary habit with less fruit intake and frequent intake of carbonated drink and fast foods. Poor dietary habit was having 2.34 times (95% C.I.:1.05-5.19) more chance of having overweight and obesity.* ***Conclusion****: Adoption of healthy lifestyle with increased physically activity, high intake of fruits and vegetables, and psychosocial support to tackle the issues of substance abuse is critical for better adolescent health.*

Key words: *lifestyles risk factors, adolescent health, school adolescents, physical activity, dietary habit, substance abuse.*

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I. Introduction:

'Lifestyle' is a pattern of individual practices and behavioural choices that are related to elevated or reduced riskofNon-Communicable Diseases (NCDs) like Obesity, Cardiovascular diseases, Diabetes Mellitusetc. As NCDs are primarily driven bylife style risk factors like physical inactivity, unhealthy diet, use of tobacco and alcohol, etc.that often starts during childhood and adolescence,they have the potential to impact child and adolescent health and bring about negative health outcomes in adulthood.Estimates suggest that approximately 70 per cent of the premature deaths that occur among adults stem from health-related behaviours that originate in childhood and adolescence.[1]

WHO has defined adolescence age group of 10-19 years as a period of transition between childhood and adulthood which represent over 16% of the world's population.[2]The adolescent population in India isone fifth of the total population[3]beingone of the highest in the world.Now the country has begun to experience the emerging problem of overweight and obesity among the adolescentsand the risk of subsequent chronic disease in adulthood; and there may be a role of emerging life style related changesbehind it; which needs exploration.However, there is paucity of information regarding the lifestyle practices of school adolescentsin Cities of North-East India. Hence, the study was conducted to estimate the prevalence of lifestyles risk factorsamong school adolescents andto determine therole of genderonlifestyles risk factors and thelifestyle risk factorsassociated with high Body Mass Index (BMI) status.

II. Methodology:

This was a school based Cross sectional study conducted among School going adolescents of three randomly selected schools of Agartala, a North Eastern city of India, between February to May 2017.The study included 11-19 years aged school going adolescents and excluded those who were sick or severely illor absent on the day of interview. Sample size was calculated to be 196, considering the prevalence of adverse life style factors to be 4.8%[4], at significance level of 5% with an absolute precision of 3. However, considering a non response rate of 10%,216 school going adolescents were included in the study.Multistage stratified sampling method was adopted; and in the first stage, three schools were selected by simple random samplingout of all schools of Agartala City. In the second stage, stratified random sampling was adopted consideringeach class (from class 6 to 11) as strata. Then from each stratum, 12 students were selected by simple random sampling using lottery method.Thus 72 students were selected from each of the three schools giving the study sample.A predesigned, pretested, standardized questionnaire adopted from WHO tool for global school based student health survey (GSHS)[5] and Physical Activity Questionnaire for Adolescents (PAQ-A)[6] were used for data collection. Bathroom weighing machine and stadiometer were used to record weight and height of the school students. WHO BMI for age Z-score for boys and girls were used to calculate the BMI for every participant[7].

The study was approved by the Institutional Ethics Committee of the college and permission was obtained from principal of each school before conducting the study. Beside, the selected students were explained regarding the purpose of the study and they were asked to take written consent of parents and give an informed assent for participating in the study. Subsequently, the randomly selected students were approached in their classes for data collection.

Data analysis was done by using Epi info 7.0. Descriptive data were expressed as frequency and percentages and statistical tests were done using Chi square testand fisher's exact test and p value <0.05 was deemed as significant.

Operational definition:

I] Physical Activity Level: The Physical Activity Questionnaire for Adolescents (PAQ-A)[6] is a nine-item, seven day self-report recall questionnaire.Each item from the questionnairewas scored between 1 to 5, with 1 suggestive of lowest physical activity and 5 suggestive of highest physical activity.Then the mean score was calculated by dividing the total score with no. of items of PAQ-A questionnaire, which resulted in the final activity summary score. The summary score was interpreted as follows: (a) **Low Physical Activity**: Total mean score <2; (b) **Moderate Physical Activity**:Total mean score2 to 4;(c) **High Physical Activity:**Total mean score >4.

II] Dietary habit:

(a)Fruits/ (b)Vegetables: Consumption in last 30 days:*Undesirable*- did not consume or consumed <1 time per day. *Acceptable*-consumed once per day. *Desirable* – consumed ≥2 times per day. (**c) Carbonated drinks:**Consumption in last 30 days: *Undesirable* – ≥1 time per day.*Acceptable* – less than once per day.*Desirable* – not taken carbonated drinks.**(d) Fast foods:**Consumption in last 7 days: *Undesirable* –≥3 days. *Acceptable* – 1 or 2 days *Desirable* – not taken .

Undesirable was given a score 0, acceptable 1 and desirable as 2. Thus for the 4 item of questions on their dietary habits a student could score from 0 to 8. The mean score in the present study for dietary habits was found to be 4.85. Hence, a student **scoring ≥4.85 was considered to have a *good dietary habit***and a student having **a mean score of < 4.85 was considered to have a *poor dietary habit***.

III] Tobacco user: A student who has used tobacco **ever**either in smoking/chewing form was considered as **everuser**.A student who has used tobacco **in last 30 days** either in smoking/chewing form was considered as **current user**.

IV] Alcohol consumer: A student who has consumed alcohol **ever**was considered as **ever consumer of alcohol.**A student who has consumed alcohol **in last 30 days**was considered as **current consumer of alcohol**.

V]BMI- BMI of the students was calculated as Weight in Kg/Height in m^2. The BMI categories of overweight and obesity was considered as high BMI status considering the 2007 BMI for age Z scores for boys and girls given by WHO.[7]

III. Results:

The present study was conducted among school going adolescents of Agartala city with 54.6% students being boys and Male to female ratio being 1.2: 1.The mean age of the participants was 14 ± 1.98 years and majority of the students belonged to Hindu religion (99.4%) and General caste (43.1%).

The present study revealed that 19.9% students had no physical activity at all and 21.8% students had only one to 2 times of physical activity in a week. Again, 20.37% students had physical activities almost 7 times

a week. Thestudents who were involved in physical activities, they were mostly involved in activities like bicycling, walking, jogging,or playing outdoor sports like cricket and badminton in last 1 week.
The present study revealed that majority (76.9%)of the school adolescents had desirable intake of Vegetables taking ≥2 times per day. Regarding fruit intake 42.60% students had desirable intake, whereas 27.80% students were having acceptable intake. Thus 70.40% students were taking fruits at least once daily. However, 33.3% students had undesirable dietary intake with consumption of fast foods and carbonated drinks. (Fig 1)

Table 2 shows the tobacco and alcohol consumption pattern among the study participants. The mean age of initiation for tobacco consumption among school adolescents was 13.61±3.33 years, and alcohol consumption was 16.28±1.03 years. Regarding the reason for initiation of the habit, majority of the students cited "as group habit with friends" as the reason behind starting tobacco use (41.67%) or alcohol consumption (83.33%). Both smoking form and chewing form of tobacco was popular among students and 75% of tobacco users had tried quitting tobacco.

Table 3 shows the prevalence of Lifestyle disease risk factors among school adolescents. The physical activity level was interpreted according to summaryscore calculated as per PAQ-A questionnaireand thestudyshowed that majority of the students (73.6%) were involved in moderate physical activity followed by 25% students involved in low physical activity and only 1.4% students were involved in high physical activity.The physical activity level was high among males compared to females and it was statistically significant (p value-0.00). Regarding dietary habit, 42.1% adolescent students had poor dietary habit in terms of less consumption of fruits, vegetables and intake of fast foods and carbonated drinks andthe dietaryhabits were found similar among both boys and girls. Regarding tobacco use, 5.5% students were ever consumers of tobacco and it was prevalent among both boys and girls, with girls mainly habituated to chewing form of tobacco. Regarding alcohol use, 2.8% adolescent students were habituated to alcohol use with all of them being boys and gender was significantly associated with tobacco use.

Table 4 shows the association of lifestyle risk factors with high BMI status among school adolescents. The study showed that 19.8% students who had poor dietary habit were having highBMI status, compared to 9.6% students with good dietary habit and dietary habit was showing significant association with high BMI status in bivariate analysis. Again, multiple logistic regression analysis showed that those who were having poor dietary habit was having 2.34 odds (95% C.I.:1.05-5.19) i.e., 2.34 times more chance of having High BMI status. However, the study showed that there is no significant association of physical activity level, smoking habit and alcohol consumption habit with the BMI status of the school adolescents.

IV. Discussion:

The present study was conducted among the school going adolescents to assess the lifestyle risk factors among them and to study the association of over-weight and obesity in them.

The present study showed that majority of the students (73.6%) were involved in moderate physical activity followed by low physical activity (25%) and only 1.4% students were involved in high physical activity. A similar study conducted in Mumbai by Patil SP et al showed that 51.12% were involved in regular exercise.[8] Another study conducted in the senior schools of urban Bareilly revealed that 22.4% adolescent students were involved in moderate intensity sports while 20.4% in vigorous intensity sports.[4]Thus, the present study revealed a poor physical activity status among the students of the city with majority students being involved in moderate or low physical activity.The present study also highlighted that majority of the school adolescents were involved in activities like bicycling, walking/ jogging, or playing outdoor sports like cricket, badminton, etc. Similar finding was obtained from a study conducted in Gujarat where the most common physical activity among both the sex (female-51.7%, Males-55.9%) was bicycling.[9]The study finding was also consistent with a study conducted in Mumbai by Patil SP et al which showed that 86.06% students were involved in outdoor games.[8] The present study also revealed that the physical activity level was significantly high among male adolescents. Similar finding was obtained from studies conducted in Bareily, UP[5] and Ananad, Gujarat[9] showing that male students being involved in sports have better physical activity compared to females.

Regarding dietary habit, the study showed that 42.60% and 76.90% of students had desirable consumption of fruits and vegetables respectively with 33.30% of students having undesired consumption of fast food and carbonated drinks. Whereas the study conducted in urban Bareilly showed majority students had undesirable food intake with respect to fruit and vegetable consumptionand 70.8% consumed adverse food items daily.[4]The study conducted by Singh AP et al showed that 44% and 47.4% students were consuming cold drink and fast food on a regular basis respectively.[10] Thus the present study showed better dietary practice among school adolescents in the study area compared to other parts of the country.

Regarding habituation the present study showed that 5.55% school adolescentswere ever consumers of tobacco, whereas 2.8% adolescents were ever consumers of alcohol. Similar findings were obtained from studies conducted in Mumbai[8], Bareli [4] and from the multicentric-study conducted by Singh AP et al[10] on 1500 adolescents of India.The present study also showed that tobacco use was common among both the genders with

males being consumer of bot smokeless or smoked tobacco, whereas females being users of only smokeless tobacco. The study also highlighted that alcohol consumption was only prevalent among boys and not in adolescent girls.

The present study showed that students who were having poor dietary habit had 2.34 times (95% C.I.:1.05-5.19) i.e., more chance of having overweight and obesity. Similar finding was obtained from a study conducted in Nepal which showed that less consumption of fruits had higher odds (3.13, 95% CI 1.39 to 7.01) of having overweight and obesity.[11]Another study conducted in Udupi, Karnataka highlighted the junk food consumption was associated with high BMI status.[12]Again a study conducted in rural South India by Mithra P et al where the physical activity duration was significantly lesser among those who were overweight and obese.[13] But the present study failed to establish any association of physical activity level with BMI status. Similar finding was obtained from a study conducted in Ethiopia where physical activity was not showing significant association with BMI status.[14]

The present study showed that majority of the school adolescents was involved in moderateor low physical activity and a considerable number of students were having poor dietary habit. There was evidence of emerging substance abuse among school adolescents.The physical activity level was found to be significantly high among males, and poor dietary habit was a significant determinant of high BMI status in the study area. Schools need to focus on adoption of healthy lifestyle by adolescents withincreased physically activity,proper health education forhigh intake of fruits and vegetables,and counselling and psychosocial support to tackle the issue of substance abuse among them.

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Conflict of interest: NIL

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Table No 1: Physical Activity pattern of the School Students in Past 7 Days

Physical activity	No	1-2 Times	3-4 Times	5-6 Times	7 or more times
Skipping	141(65.3%)	26(12%)	25(11.6%)	12(5.6%)	12(5.6%)
Walking for exercise	59(27.3%)	50(23.1%)	57(26.4%)	**20(9.3%)**	**30(13.9%)**
Bicycling	102(47.2%)	25(11.6%)	24(11.1%)	**22(10.2%)**	**43(19.9%)**
Jogging or running	89(41.2%)	47(21.8%)	38(17.6%)	19(8.8%)	**23(10.6%)**
Swimming	184(85.2%)	22(10.2%)	3(1.4%)	3(1.4%)	4(1.9%)
Dance	150(69.4%)	25(11.6%)	21(9.7%)	12(5.6%)	8(3.7%)
Football	138(63.9%)	31(14.4%)	22(10.2%)	14(6.5%)	11(5.1%)
Badminton	101 (46.8%)	47 (21.8%)	30 (13.9%)	**20 (9.3%)**	18 (8.3%)

Cricket	109 (50.5%)	38 (17.6%)	24 (11.1%)	**21 (9.7%)**	**24 (11.1%)**
Any of the above	***43 (19.9%)***	***47 (21.8%)***	***58 (26.85%)***	***24 (11.1%)***	***44 (20.37%)***

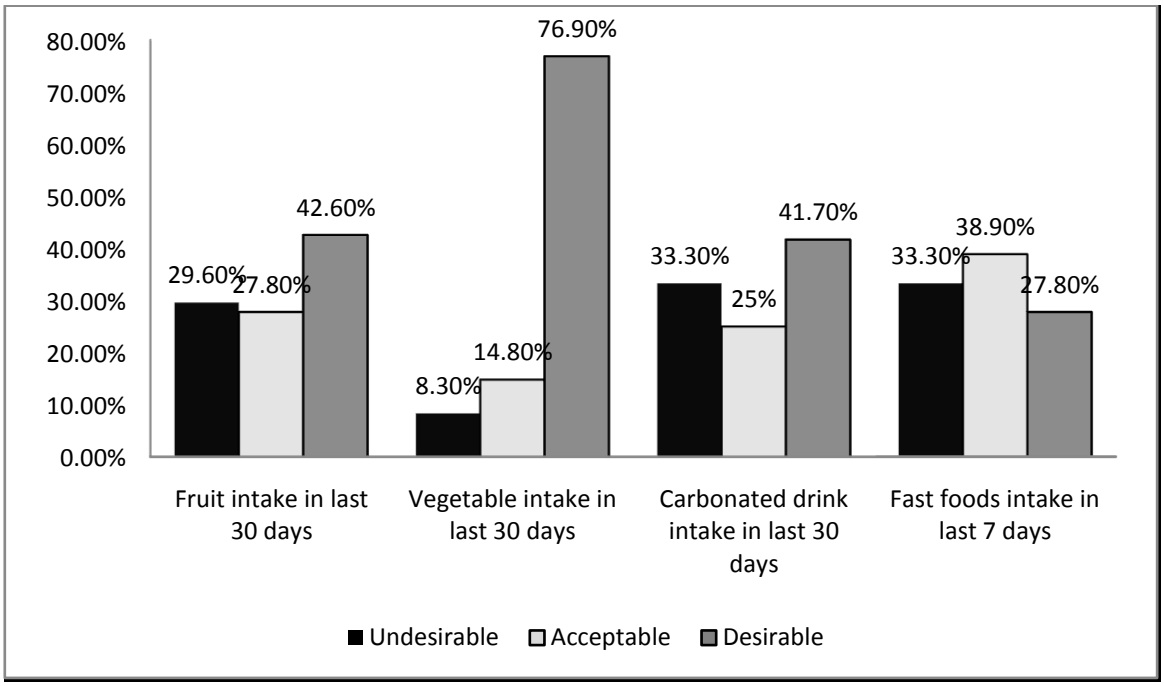

Fig 1: Bar diagram showing the dietary habits of the respondents.

Table 2. Substance abuse pattern among school adolescents.

Tobacco consumption pattern		
Age at initiation of tobacco (mean ± SD) in years		13.61± 3.33 years
Reason for initiation [n=12 (%)]	As a group habit with friends	5 (41.67%)
	For change of taste	4 (33.33%)
	Peer pressure	2 (16.66%)
	To gain confidence	1 (8.33%)
Type of tobacco use [n=12 (%)]	Smoking tobacco-Cigarette	5 (41.67%)
	Chewing tobacco- Zarda, khaini, guthka.	7 (58.33%)
Tried quitting [n=12 (%)]	Yes	9 (75%)
	No	3 (25%)
Alcohol consumption pattern		
Age at initiation of alcohol (mean ± SD) in years		16.28 ± 1.03 years
Reason for initiation [n=6 (%)]	As a group habit with friends	5 (83.33%)
	For a sense of wellbeing	1 (16.67%)
Source of Alcohol [n=6 (%)]	Self purchase	2 (33.33%)
	Purchased through someone	1 (16.67%)
	Got from friends	3 (50%)
Tried quitting [n=6 (%)]	Yes	2 (33.33%)
	No	4 (66.67%)

Table 3. Distribution of Lifestyle disease risk factors among school adolescents.

Life style disease risk factors		Frequency n=216(%)	Male n=118 (%)	Female N=98 (%)	P value
Physical activity level	High physical activity	3 (1.4%)	2 (66.7%)	1 (33.3%)	0.00**
	Moderate physical activity	159 (73.6%)	103 (64.8%)	56 (35.2%)	
	Low physical activity	54 (25%)	13 (24.1%)	41 (75.9%)	
Dietary habits	Good dietary habit	125 (57.9%)	65 (52%)	60 (48%)	0.36*
	Poor dietary habit	91 (42.1%)	53 (58.2%)	38 (41.8%)	
Tobacco use	Current user	9 (4.16%)	--		
	Ever user	12 (5.55%)	8 (66.7%)	4 (33.3%)	0.38*
	Non user	204 (94.45%)	110 (53.9%)	94 (46.1%)	
Alcohol consumption habit	Current consumer	5 (2.3%)	--		
	Ever consumer	6 (2.8%)	6 (100%)	0	0.02**
	Non consumer	210 (97.2%)	112 (53.3%)	98 (46.7%)	

*p value calculated using Chi square tests

** p value calculated using Fisher's exact test.

Table 4. Association of lifestyle risk factors with BMI status among school adolescents

Life style disease risk factors		High BMI status [n=30(13.8%)]	Normal or Low BMI status [n=186(86.2%)]	P value	Multiple logistic regression analysis	
					OR (95% C.I.)	p value#
Physical activity level	Low physical activity	8 (14.8%)	46 (85.2%)	0.82*	1.06(0.43-2.58)	0.89
	High/Moderate physical activity	22 (13.6%)	140(86.4%)		1	
Dietary habits	Poor dietary habit	18 (19.8%)	73(80.2%)	**0.03***	2.34(1.05-5.19)	**0.03**
	Good dietary habit	12 (9.6%)	113(90.4%)		1	
Smoking habit	Ever Smoker	1 (8.3%)	11 (91.7%)	1.00**	0.40(0.03-4.32)	0.45
	Non smoker	29 (14.2%)	175(85.5%)		1	
Alcohol consumption habit	Ever consumer	1 (16.7%)	6 (83.3%)	0.59**	1.44(0.11-18.08)	0.69
	Non consumer	29 (13.8%)	181(86.2%)		1	

*p value calculated using Chi square tests
** p value calculated using Fisher's exact test.
# p value calculated using Multiple logistic regression analysis
OR (95% C.I.)- Odds ratio (95% Confidence interval)

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