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# Lifestyle factors influencing medical and nursing student's health status at the rural health-care institute

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## Abstract:

**BACKGROUND:** Noncommunicable diseases (NCDs) may be influenced by lifestyle behavior, acquired during transition in student life at university. Health is a major concern globally. The developing countries are facing a double burden of disease, both communicable and NCD. This study is aimed to assess the lifestyle and its associated factors that can affect the health status of medical and nursing students.

**MATERIALS AND METHODS:** A community-based cross-sectional study was conducted among medical and nursing students of Sasaram, Bihar, by universal sampling. The study population consisted of 303 medical and 233 nursing students. The 536 students in the study, included 195 from rural areas and 341 from urban areas. Simple Lifestyle Indicator Questionnaire was used and Chi-square statistics was computed to determine the association of demographic variables with lifestyle behavior using Epi Info™ 7 analysis software.

**RESULTS:** Mean age and body mass index were  $21 \pm 2.59$  years and  $22.12 \pm 3.77$ , respectively. After statistical analysis utilizing the Chi-square test, it was shown that the difference was found to be nonsignificant ( $P > 0.05$ ) in all the following variables, such as gender, age, marital status except in designation, and alcohol and tobacco intake which showed the difference to be highly significant.

**CONCLUSIONS:** The maximum number of students in the study population showed intermediate healthy lifestyle (57.1%), despite being the upcoming health-care providers of future. Fruits were rarely present in diet in 82%, no physical activity in 21.2%, and tobacco and alcohol were consumed by 11.7% and 13%, respectively. Targeted intervention for healthy diet, physical activity, stress, tobacco, and alcohol reduction can lead to healthy lifestyle. Independence and autonomy gained in the transition phase in student life needs guided supervision to raise responsible adults. It may help to assist or to plan accordingly in future to improve lifestyle of the students.

## Keywords:

Behavior, dietary habit, healthy lifestyle, noncommunicable diseases, Simple Lifestyle Indicator Questionnaire, students

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## Introduction

Currently, India is experiencing epidemic of noncommunicable diseases (NCDs) due to increase in the prevalence of diabetes, cancer, coronary heart disease, and hypertension. During this epidemiological transition, NCDs are becoming public health concern globally.<sup>[1]</sup> It has become a challenge for which India has set a

specific target aiming at reduction of NCDs mortality by 25% by the year 2025.<sup>[2]</sup> Impact of lifestyle habits on health-related quality of life<sup>[3]</sup> has been emphasized by the World Health Organization (WHO). NCDs are associated with unhealthy diet, tobacco, alcohol, and sedentary lifestyle and mental stress.<sup>[4,5]</sup> Healthy lifestyles such as adequate nutrition, physical activity, and adoption of good habits help to maintain the balance between man and environment and avoidance of NCDs. Lifestyle is influenced

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by the social interaction with parents, sibling, teacher, and social media.<sup>[6]</sup> Literatures show that college students have negative health behavior, as they are engaged in preparation for competitive exams. Thus, the physical activity is minimal and the mental stress is at the peak.<sup>[7]</sup> The daily activity of adolescents and youth plays an important role in adopting health-related behavior. In later stages of life, it is difficult to change the behavior.<sup>[8,9]</sup> The youth represent a large proportion of the population. A part of the youth take up the challenge to dedicate themselves as health providers. They are involved in health promotion and are the role models of the society. However, in medical schools, health is taught but health promotion is not done.<sup>[10,11]</sup> It is thus necessary to enquire the habit of upcoming health-care professional involved in patient care, advising them on health and nutrition-related lifestyle education. Whether they follow their advices can be enquired by their lifestyles.

Annually, a large number of students enroll in nursing and medical college. This can lead to change in place for pursuing higher education. This newness may be welcome, but the process may demand adaptability to recent changes or acquiring coping strategies. It is seen that place of residence and cultural factors affect eating habits.<sup>[12]</sup> During 18–25 years, there is greater lifestyle freedom than ever before.<sup>[13]</sup> Independent living arrangements may influence food choices and nutrient content of food and good dietary habits tend to decline.<sup>[14]</sup> Research has shown that doctors who have a healthy lifestyle are more likely to talk to their patients about it and may be a role model for a patient, who is more likely to follow such doctors.<sup>[15]</sup> Industrialization, urbanization, financial advancement, and market strategies have led to lifestyle changes of the worldwide population. As a result, during the last few decades, dietary changes have led to increase in fat intake, commonly in the form of saturated fat and decline in cereals, fruits, legumes, and vegetables eating.<sup>[16]</sup> Changing lifestyle, in both urban and rural areas, has opened up Pandora's box of NCDs. Rural youths have different environmental factors and lower financial status than their urban counterpart, thus limiting their access to sports facility, variety of food, and active way of spending their time. Students are from both urban and rural areas. Thus, the aim of the study was to assess the lifestyle and its associated factors that affect the health status of medical and nursing students. In the study, rural students were residents of rural areas and had lived there before coming to college, whereas urban were those who were residents of urban areas.

## Materials and Methods

### Study design and setting

This research is a community-based cross-sectional study. It was performed on medical and nursing students

of phase I, II, and III studying in Narayan Medical College, Jamuhar village, Rohtas District, Bihar, India.

### Study participants and sampling

All the students who were present on the day of questionnaire distribution and those who gave consent to participate were included in the study. Students who did not give consent or those suffering from mental illness were excluded from the study. Interviews were conducted after getting permission from the principal of the college and consent from the students. Universal sampling was done, as all students enrolled constituted the sampling frame. Medical and nursing students of the college were grouped in batches according to the year of enrolment, students of all year/phase were included. The students of the same phase were called in batches in the evening and explained about the questionnaire. The questionnaire was distributed to each individual of the batch. The completely filled questionnaire was collected from each participant. Anonymity was maintained by giving alphanumeric codes to study population instead of names. The data collection was completed in a month time. This study was approved by the Ethical Committee of Narayan Medical College, Sasaram, with IEC No. IEC/2016/01.

### Data collection tool and technique

The students were interviewed using a self-administered structured and pretested questionnaire consisting of three parts. First part included sociodemographic details and anthropometric measurements, the second part contained Simple Lifestyle Indicator Questionnaire (SLIQ), and the third part had clinical examination of the students. The SLIQ has 5 components: diet (3 questions) consists of green leafy salad, fresh fruits, and high fiber cereals; activity (3 questions) component consists of light, moderate, and vigorous exercise; alcohol consumption (3 questions) included type and time of consumption of alcohol; smoking (2 questions) – yes/no, if no, ever smoked; and stress (1 question) self-assessment of stress on a Likert scale of 1–6. For each component, raw score and category score can be calculated. Each component has a category score of 0, 1, or 2, so overall SLIQ scores can range from 0 to 10. The higher the score, the healthier is the lifestyle.

Weight was measured in kilograms, after removal of shoes and height was measured in meters with help of a stadiometer without shoes in a standing position by maintaining straight body alignment and arms hanging free by the side. Body mass index (BMI) was measured by the formula weight in kilograms/height in meters.<sup>[2]</sup>

### Data analysis

The quantitative data were entered into a Microsoft Excel sheet and analyzed using Epi InfoTM 7 (available

at: <http://www.cdc.gov/epiinfo>). after data cleaning. Categorical data were presented as numbers and percentages, while continuous data were expressed as means and standard deviation. The associations between various parameters were calculated using Fisher’s exact or Chi-square test, as appropriate. Confidence interval of 95% was used and  $p < 0.05$  was considered significant.

### Operational definition

#### Rural

Students who were residents of rural areas and had lived there before coming to college.

#### Urban

Students who were residents of urban areas and had lived there before coming to college.

The designated rural and urban areas were based on the classification as used by the Census Bureau and the list obtained from the municipal corporation of the area.

## Results

A total of 544 medical and nursing students were enrolled, but during data entry, it was found that 536. Performa was complete in all respects and was finally analyzed for the study. Among 536 students enrolled, 195 from rural areas and the rest from urban areas were included. The mean age of students was found to be  $21.46 \pm 2.59$ , with a range of 17–35 years. The mean height and weight were found to be  $162.64 \pm 9.90$  and  $58.73 \pm 13.26$ , respectively. The mean BMI in our study was found to  $22.12 \pm 3.78$  with a minimum of 14.00 and maximum of 38.60 [Table 1].

In our study, more than half (57.5%) of the students received a diet category score of 1. The activity category score of 2 was assigned to 44.4% of students based on the activity raw score, 86.9% of students received the alcohol category score of 2 based on their consumption. Similarly, smoking score was also found to be 2 in majority (88.2%) of our students. More than half (56.3%) of them received a stress score of 1 [Table 2]. On calculating the combined SLIQ score, it was found that only 3.9% of the students were in unhealthy category, and one-third (39.0%) of them were healthy [Figure 1]. Table 3 shows the health and lifestyle characteristics of students based on SLIQ score and its association with demographic and social characteristics. Chi-square test of independence was calculated to find association of various sociodemographic factors with SLIQ score. More than half (58.4%) of the students were in the age group of 17–21 years and out of them, 55.6% were in intermediate healthy and 39.0% were in healthy category as per the SLIQ score. Majority of male (57.5%) and female (60.4%) were found to be intermediate healthy. Out of 440

**Table 1: Sociodemographic factors and anthropometric profile of students**

Variables	n	Mean±SD	Minimum	Maximum
Age	536	21.45±2.59	17.00	35.00
Height	536	162.63±9.90	138.00	190.00
Weight	536	58.73±13.25	35.00	111.00
BMI	536	22.12±3.77	14.00	38.60
Waist circumference	536	78.08±11.58	34.00	110.00
Hip circumference	536	90.80±9.50	40.00	125.00
WHR	536	0.85±0.08	0.47	1.20
Systolic BP	536	119.14±11.59	87.00	160.00
Diastolic BP	536	76.35±9.56	52.00	133.00

SD=Standard deviation, BMI=Body mass index, BP=Blood pressure

**Table 2: Simple Lifestyle Indicator Questionnaire category score**

Category	Score		
	0, n (%)	1, n (%)	2, n (%)
Diet score	68 (12.7)	308 (57.5)	160 (29.9)
Activity score	114 (21.3)	184 (34.3)	238 (44.4)
Alcohol score	0	70 (13.1)	466 (86.9)
Smoking score	0	63 (11.8)	473 (88.2)
Stress score	149 (27.8)	302 (56.3)	85 (15.9)

unmarried students, 57.9% were in intermediate category and 37.9% in the healthy lifestyle category. Based on the residence, 4.1% and 3.6% of urban and rural, respectively, were found to be following unhealthy lifestyle. In our study, 62.0% of medical and 50.6% of nursing students were in the intermediate healthy category. All the students following vegetarian diet were either healthy (38.2%) or intermediate healthy (61.8%). Majority of students (63.4%) were skipping breakfast and only 11.7% and 13.1% were using tobacco and alcohol in our study [Table 4].

After statistical analysis using the Chi-square test, it was found that the difference was found to be nonsignificant ( $P > 0.05$ ) for gender, marital status, and residence and was significant for college ( $P = 0.030$ ), tobacco use ( $P < 0.001$ ), and alcohol use ( $P < 0.001$ ).

In the study, we have tried to compare lifestyle factors among nursing and medical students. The raw diet score of 2 was found to be 37.8% and 23.8% for nursing and medical students, respectively, and this was statistically significant between the two groups. Almost three-fourth (71.0%) of medical students and half (53.6%) of nursing students were skipping breakfast. Three-fourth of both medical and nursing students preferred homemade food over outside food. About 31.7% of medical students were consuming junk food  $\geq 3$  times/week. Daily consumption of salad was found in 44.2% and 32.3% of nursing and medical students. Less than one-fifth of students were consuming fruits daily. The stress score was found to be 2 in 20.6% of nursing students

**Table 3: Demographic factors and its association with Simple Lifestyle Indicator Questionnaire score**

Variables	SLIQ score			$\chi^2$	df	Significance
	Unhealthy (n=21)	Intermediate (n=306)	Healthy (n=209)			
Age group (years)						
≤21	17	174	122	4.694	2	0.096
>21	4	132	87			
Gender						
Male	13	138	107	3.510	2	0.173
Female	8	168	102			
Marital status						
Married	3	51	42	1.188	2	0.552
Unmarried	18	255	167			
Residence						
Urban	14	201	126	1.652	2	0.438
Rural	7	105	83			
Designation						
Nursing	10	118	105	7.044	2	0.030
Medical	11	188	104			
Diet type						
Vegetarian	0	68	42	5.988a	2	0.050
Mixed	21	238	167			
Tobacco use						
Yes	12	45	6	60.182	2	<0.001
No	9	261	203			
Alcohol use						
Yes	11	49	10	43.552	2	<0.001
No	10	257	199			

\*1 cells (16.7%) have expected count<5. The minimum expected count is 4.31. SLIQ=Simple Lifestyle Indicator Questionnaire

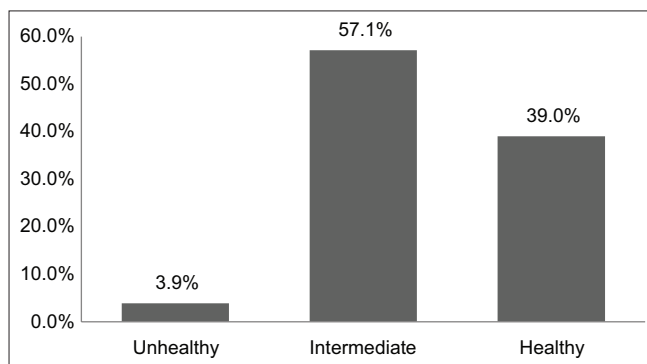


Figure 1: Simple Lifestyle Indicator Questionnaire score distribution

and 12.2% of medical students, indicating more stress in medical students. After applying Chi-square test, the difference in nursing and medical students was found to be significant for diet score, stress score, skipping breakfast, junk food, and salad frequency. Majority of our students had smoking and alcohol score of 2 indicating a healthy lifestyle [Table 4].

## Discussion

The present study was undertaken to assess the lifestyle among medical and nursing students of Sasaram, Bihar, India. The study population consisted of 536 medical and nursing students, which comprised 258 males and

278 females. Majority of the students were of normal range, according to the recommended WHO BMI cutoff points for Asians.<sup>[17]</sup> Mean age also corresponds to that of university students. Anthropometric parameters were within the normal limit. Among them, 303 (56.5%) were medical and 233 (43.4%) nursing students. In this study, based on the SLIQ score, it was found that only 3.9% of the students were in unhealthy category, and one-third (39.0%) of them were healthy, 57.1% were in the intermediate category, which is almost comparable to a study where 8.7%, 28.0%, and 63.3% of practitioners had unhealthy, healthy, and intermediate healthy lifestyle, respectively.<sup>[18]</sup> Unhealthy lifestyle was 12.7%, 21.3%, and 27.8% for diet, physical activities, and stress level, respectively, as compared to another study that shows unhealthy lifestyle for diet, physical activity, and stress as 36.9%, 50.1%, and 20.2%, respectively.<sup>[19]</sup> Various studies done previously on health-care professionals have proven that many had unhealthy lifestyles.<sup>[20,21]</sup>

Our study showed that there were no significant findings found among variables, such as gender, designation, marital status, residence, and diet type. However, there was a statistically significant difference between the two groups contradictory to other studies which did not show any statistically significant difference among medical and nursing students.<sup>[21]</sup> This difference is significant for diet,

**Table 4: Comparison of lifestyle factors among nursing and medical students**

Variables	College		$\chi^2$	Df	Significance
	Nursing (n=233), n (%)	Medical (n=303), n (%)			
Diet score					
0	37 (15.8)	31 (10.2)	20.823	2	<0.001
1	108 (46.4)	200 (66.1)			
2	88 (37.8)	72 (23.7)			
Diet type					
Vegetarian	50 (21.5)	60 (19.8)	0.222	1	0.638
Mixed	183 (78.5)	243 (80.2)			
Skipping breakfast					
Yes	125 (53.6)	215 (70.9)	17.013	1	<0.001
No	108 (46.4)	88 (29.1)			
Food preference					
Homemade	178 (76.3)	218 (71.9)	1.350	1	0.245
Outside	55 (23.7)	85 (28.1)			
Junk food frequency					
<3/week	191 (81.9)	207 (68.3)	12.851	1	<0.001
≥3/week	42 (18.1)	96 (31.7)			
Salad frequency					
<1/day	130 (55.7)	205 (67.6)	7.909	1	0.005
≥1/day	103 (44.3)	98 (32.4)			
Fruit frequency					
<1/day	188 (80.6)	252 (83.1)	0.410	1	0.522
≥1/day	44 (18.4)	51 (16.9)			
High fiber diet frequency					
<1/day	38 (16.3)	35 (11.5)	2.534	1	0.111
≥1/day	195 (83.7)	268 (88.5)			
Activity score					
0	46 (19.7)	68 (22.4)	2.248	2	0.325
1	75 (32.1)	109 (35.9)			
2	112 (58.2)	126 (41.7)			
Stress score					
0	73 (31.3)	76 (25)	12.705	2	0.002
1	112 (48)	190 (62.7)			
2	48 (20.7)	37 (12.3)			
Tobacco score					
1	26 (11.1)	37 (12.2)	0.141	1	0.708
2	207 (88.9)	266 (87.8)			
Alcohol score					
1	28 (12)	42 (13.8)	0.395	1	0.530
2	205 (88)	261 (86.2)			

skipping breakfast, junk food consumption, frequency of salad intake, and stress score. The difference in dietary pattern may be due to fact that many nursing students lived at home as most were native of that area. but medical students stayed in the hostel as they came from far off places and stay was mandatory for them. As well, the canteen dietary chart was prepared as per the availability of economical raw vegetables in the rural market.

Students living at home often follow a healthy lifestyle due to more time and support and also had a variety in diet. Conversely, students living away from home tend to manage by themselves leading to increase workload and

a major shift in habit, one of which may be modification in dietary habits, consumption of packaged, junk, ready to eat, and processed food. Fruits are not easily available in canteen has to be fetched from outside.<sup>[22]</sup> Short time between the class schedule lead to skipping of breakfast, little choice for preferred food, and snacking between the meals. Skipping of meal is more in medical students due to late hours of self-study, classes in the early morning, and the habit of waking up late. Students head back to accommodation after long hour of exhaustive class do not find any time for leisure. Students sought alternatives of leisure time pursuit such as watching TV, mobile, or laptop. Sport facility is also absent in the

campus, hampering physical activity. Sedentary lifestyle can lead to harmful health outcomes. Stress may also influence lifestyle, as they may be involved in substance use. Any exposure to tobacco can be due to multiple reasons, but in the particular group, we could not find any predominant use. In transition from adolescence to adulthood, students make independent decisions about their diet, activity, and strategies to cope with stress. These findings were consistent with the study done on Mosul university students of Iraq, which highlighted the presence of unhealthy eating behaviors and inadequate nutrient intake among university students.<sup>[20]</sup> They lack knowledge of healthy food choices that may affect nutritional status negatively. Studies among university students have reported problems such as they skip breakfast and eat snacks, physical inactivity, and smoking.<sup>[23]</sup> Poor eating habit is a major public health concern among young adults who experienced transition into university life, during which they are exposed to stress and lack of time.<sup>[21,24]</sup> These factors pose a barrier against adoption of healthy lifestyles, such as poor eating habits and physical inactivity. These behaviors should not be seen as temporary as they can persist in later phases also.<sup>[25]</sup> Junk food frequency is higher in medical students, due to ease of availability, experimenting with new flavors available, to enjoy company of new friends and partying together, these social interactions also can also lead to smoking and alcohol consumption. Definitely, this can be initiating factor and can lead to regular use later. Increase in tobacco, alcohol, and illicit drug use between 18 and 25 years has been reported.<sup>[26]</sup> Combination of stressors has a significant impact on lifestyle choices.<sup>[27]</sup> Junk foods are making place in student's diet due to their ease of availability, taking less time to prepare, quench the taste preferences and feeling of gratification after consumption. Stress is present in almost both the groups. Students spend more time for receiving theory and practical courses so fast-food conserve their time, another believe that unhealthier foods such as fast food are less expensive and easy to cook. As well as, lack of students' knowledge about the importance of eating healthy food and its content. It is stated that students often select fast food due to its palatability, availability, and convenience, and studies have reported higher levels of fast-food consumption among the university students.<sup>[28,29]</sup> Higher fiber intake seen is associated with positive outcomes, but lower fruit and salad consumption can lead to harm that can be associated with development of cardiovascular diseases in long run. Skipping breakfast can lead to obesity but consumption of homemade food reflects healthy dietary habits. Consistent finding from previous studies shows new environmental and social factors might be responsible for adoption of unhealthy eating habits among students.<sup>[30]</sup>

Among these groups, the health habits are a special concern, as lifestyle modifications take place,<sup>[3,31]</sup> and if these changes become fixed routines, they are likely to determine the person's future health<sup>[32,33]</sup> and also of society as they are role model and upcoming health care professionals.

Urbanization and industrialization has led to transition in nutrition across rural and urban areas and hardly, there is any difference in eating habit among them. A paradox is seen as poverty and lack of purchasing capacity lead to unhealthy dietary, but in the study, it is seen that medical students from well to do family tend to consume more of fast food as they have high purchasing capacity and poor quality of foods served at canteens. Independent living may lead to acquiring easy-going or rather unhealthy lifestyle. Other factors are equally responsible for the changes. We cannot assume that merely the syllabus can cater to these problems. Guided and focussed or rather dedicated approaches in nutrition and health education can solve these problems.

### Limitations

The survey was designed to focus on the lifestyle behavior influencing health of medical and nursing students, so this may a small representation of students between the age of 18 and 25 years. The study gives an insight into evolution of students throughout the graduation. In general, the healthy habits tend to improve in transition period, but sometimes, it may damage by socioeconomic factors as well as academic overload. Outcome measures based on self-report and may be subject to biases. Substance use may also be underreported. Information related to diet and physical activity may be subjected to recall bias.

### Conclusions

The maximum participants of the examined population showed an intermediate healthy lifestyle which may be a warning sign and can lead to further increase in NCD burden. Hence, there is a great scope of organizing health-promoting programs for healthy lifestyles to increase awareness and to give knowledge about healthy diet, exercises, to reduce stress, smoking, and alcohol intake.

Unhealthy lifestyles are the predictors of NCDs. These findings are extremely useful for guiding future curricular changes into medical schools. Despite lot of attention is given to the promotion of a healthy lifestyle based on balanced and varied diet and adequate exercise, no intervention is targeted directly at young adults. Poster, pamphlet, or diet chart can be displayed in lecture hall or canteen and regular campaign onto raise awareness on NCDs and promotion of healthy lifestyle,

i.e. provision of healthy meal by college at affordable prices. Day scholars are under the direct supervision of parents, thus protecting them from adoption of risk behavior, but we assume that emerging adults require health education and supervision by the hostel warden or the professor at college for the right guidance. Lack of adequate supervision can lead to development of adverse health-risk behaviors which could impact their entire lives. Targeted intervention for nutrition and physical activity should be provided for effective primary prevention of NCDs. These findings can further guide us in implementation of foundation course, introduced recently where all these issues are taken care of.

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### Conflicts of interest

There are no conflicts of interest.

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