



ASSOCIATION OF PHYSICAL ACTIVITY, BODY MASS INDEX AND DIETARY PATTERN AMONG MEDICAL UNDERGRADUATE STUDENTS OF RAIPUR CHHATTISGARH: A CROSS-SECTIONAL STUDY

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ABSTRACT

Introduction: Consumption of high calorie food and lack of sufficient physical activity in college going students in future may cause several non communicable diseases. So this study was undertaken to know the pattern of physical activity, Body mass index (BMI) and dietary pattern of undergraduate medical students of Raipur city.

Material and methods: This Cross-sectional study was done on 150 medical students of second MBBS batch in Pt JNM medical college, Raipur in month of August 2015. For assessing physical activity, Global Status Report 2014 was used. Appropriate statistical analysis was used in this study.

Results: In Students with sufficient physical activity, 83.1% were normal in weight and only 16.9% were overweight. 70.6% students were overweight due to high calorie food intake.

Conclusion: This study observes an inverse relationship between physical activity and BMI and a positive relationship between diet and BMI.

KEYWORDS : BMI, Medical undergraduate students, Physical activity.

INTRODUCTION:

Physical inactivity acts as one of the leading risk factor for development of non communicable diseases like ischemic heart disease, stroke, diabetes, breast and colon cancer.⁽¹⁻¹¹⁾ The rate of inactivity is high in the all developed and developing countries and this issue is considered a major health problem in large cities and industrialized communities.⁽¹²⁾

Physical activity is defined as "The bodily movement produced by skeletal muscles that result in energy expenditure."⁽¹³⁾ A regular physical activity (moderate/ vigorous) as recommended by WHO, result in balance in energy expenditure and high calorie diet intake. Most of the studies⁽¹²⁻¹⁷⁾ suggest that physical inactivity in young age may lead to many health problems later in life. According to WHO Report, there is a correlation between physical activity, improper diet, excessive weight and obesity.⁽⁴⁾

According to Global status report on NCDs 2014, physical inactivity causes 32 million deaths each year. In 2010, 23% of adults aged 18 years and above were found with insufficient physical activity, women were less active than men with 27% of women and 20% of men not reaching the recommended level of physical activity.⁽¹⁾

The purpose of our study was to determine level of physical activity and body mass index along with high calorie diet in student of medical college with following objectives:

1. To know the pattern of physical activity among undergraduate medical students of Raipur city.
2. To know their Body mass index (BMI) and dietary pattern.
3. To know the association of BMI with Physical activity and dietary pattern.

Medical college students are less engaged in the physical activities due to their academically oriented environment though they have a substantial knowledge about physical activity and its benefits.⁽¹²⁾ It is necessary for them to engage sufficiently in physical activity, because in future when they become health professional, they would act as counselor for the community or the patients.

METHODOLOGY:

This study was a cross-sectional study done in the Department of community medicine, Pt. JNM medical college, Raipur in month of

August 2015, in which the study participants were all undergraduate second year MBBS students who were present in the class room and willing to participate. A total of 173 students were enrolled, but during day of interview 163 students were present and they gave their consent for participation in this study.

The proforma contain pretested, semi-structure questionnaire related to:

1. Demographic details e.g. name, age, gender, address, type of family
2. BMI in kg divided by meter²
3. Dietary habits in which frequency and preference of type of food like junk food, sweet, chocolate were taken
4. Physical activity of study subjects like their involvement in physical activity (moderate and vigorous) in days and duration since last 7 days were taken.

After pilot survey in different professional year's students' necessary modification were done in the proforma.

On the day of data collection, explanation of our study purpose was done. The proforma was distributed for collecting the necessary information after getting informed consent individually. Twenty minutes were given for filling the proforma.

During the time of data collection, proforma were checked for any missing information and requested to participant to fill it completely. Later appropriately filled 150 proformas were included in the study, then weight (in kilogram) and height (in meter) of each students were taken for calculation of body mass index, weight was measured by using weight machine and height was measured by using non-stretchable measuring tape. In the proforma for physical activity monitoring we adopted global monitoring framework 2014 guidelines. After data collection a short lecture on benefit of sufficient physical activity and balance diet were taken in a hope that they will in future follow good healthy life style.

For monitoring the sufficient physical activity, three criteria were given for Persons who were aged 18 years and over-150 minutes of moderate-intensity physical activity per week; 75 minutes of vigorous-intensity physical activity per week; An equivalent

combination of moderate and vigorous intensity physical activity, accumulating at least 600 MET-minutes per week.

Person who did not follow any of the criteria were considered to have insufficient physical activity.

Where MET refers to metabolic equivalent. It is the ratio of a person's working metabolic rate relative to the resting metabolic rate. One MET is defined as the energy cost of sitting quietly, and is equivalent to a calorie consumption of 1 kcal per kg per hour.

For measuring obesity Body mass index is considered as simplest, most widely acceptable methods of measurements. (19) For BMI WHO definitions were used to categorize students as normal weight (BMI: 18.5-24.9), Overweight (BMI: 25-29.9) and obese (BMI: ≥30).

After data collection analysis was done by using MS excel, for statistical analysis Chi-square test was used, Difference were regarded as statistically significant at p<0.05.

RESULTS:

In this study, a total of 150 medical students were included. The percentage of boys and girls was 55.3% and 44.8% respectively. 55.3% students followed the recommended level of physical activity. Majority (62.7%) of the boys were indulged in sufficient physical activity then girls (37.3%).

Forty four percent students were insufficiently physically active, among them 46.3% were boys and 53.7% were girls.

Among the study subjects, 22.8% had BMI >25. Prevalence of being overweight was higher among boys 28.9% than girls 14.9%. No participants were found to be obese (BMI ≥30). 47.3% study subjects were frequently taking high calorie food. 40(48.2%) boys consumed high calorie food slightly higher than girls (46.3%). (Table-1)

Table: 01 Physical activity level, Body mass index and high calorie food intake status among study subjects (n=150)

Physical activity level	Girls (n=67) N(%)	Boys(n=83) N(%)	Total
Sufficient	31(46.3)	52(62.7)	83(55.3)
Insufficient	36(55.6)	31(37.3)	67(44.8)
Body mass index			
≤ 24.9	57(87.1)	59(71.1)	116(77.3)
> 25	10(14.9)	24(28.9)	34(22.8)
High calorie food intake			
Frequent*	31(46.3)	40(48.2)	71(47.3)
Less frequent**	36(53.7)	43(51.8)	79(52.7)

*Frequent- Daily eater ** Less Frequent-weekly/fortnightly/monthly eater.

In our study, when physical activity level was compared with body mass index it was found that majority of the students, who were doing sufficient physical activity (83.1%) were normal in weight and only 16.9% were overweight .70.1% students who were doing insufficient physical activity were normal in weight and 24.1% were overweight and obese. but no significant association was found between them. (Table-2)

Table: 02 Association of physical activity level with body mass index (n=150)

Physical activity level	Body mass index		Chi-square	P value	OR(95% CI)
	>25 No. (%)	≤24.9 No. (%)			
Insufficient	20(24.1)	47(70.1)	X ² =3.55	P>0.05	2.09(0.96-4.56)
Sufficient	14(16.9)	69(83.1)			

BMI were compared with frequency of high calorie food intake, in which frequently high calorie food intake were significantly

associated with BMI. (P-.004) .Among the students who were overweight 70.6% frequently consumed high calorie food. Similarly, of the students with normal BMI, 56.9% students less frequently consumed high calorie food. (Table- 3), this implies positive relation between high calorie food intake and BMI.

Table: 03 Association between body mass index and frequency of high calorie food intake (n=150)

*Frequent- Daily eater ** Less Frequent- weekly/fortnightly/monthly eater.

Body mass index	Frequency of high calorie food intake		Chi-square	P value	OR(95% CI)
	Frequent No.(%)	Less frequent No.(%)			
>25	24(70.6)	10(29.4)	X ² =7.94	P<0.05	3.16(1.38-7.22)
≤24.9	50(43.1)	66(59.9)			

DISCUSSION:

This cross-sectional study is done to find out the prevalence of physical activity among medical students and also to assess the relationship between BMI and high calorie intake. This study showed that more than half of the medical student followed the recommended level of physical activity and this study also showed positive relationship between high calorie food intake and BMI. This study also showed an inverse relationship of recommended level of Physical activity with body mass index. Several other studies have found similar relationship.

In our study, more boys participated (55.3%) when compared to girls (44.8%). Kumar *et al*⁽¹²⁾ showed more girls 52.4% compared to boys 47.6%. While Tanu *et al*⁽¹³⁾ showed more participation of males (60.9%) when compared to females(39.1%).

In this study, Overall, 55.3% students followed the recommended level of physical activity using global monitoring framework 2014, whereas study done in medical students of central Delhi, India by Tanu *et al*⁽¹³⁾ showed 32.3% students following the CDC recommended level of physical activity, which was lower than our study,

In this study, as pointed out earlier, students who followed the recommended level of physical activity, majority of them, i.e.62.7% boys were indulged significantly in sufficient physical activity as compared to girls (46.8%). Similar finding were found in study done in central Delhi, India⁽¹³⁾ but contrast result were seen in a previous study done by kumar *et al*⁽¹²⁾ in which more girls were involved in sufficient physical activity (55.1%) compared to boys(44.9%).In our study, physical activity was insufficient in 44.8% students. Among them 46.3% were boys and 53.7% were girls. In Global status report 2014⁽¹⁾, in 2010, physical activity was insufficient in 23% of adults 18 years and over, among them 27% of women and 20% of men were not reaching the recommended level of activity. In our study, Prevalence of being overweight was higher among boys 28.9% than girls 14.9%. Similar finding were observed in a study done by tanu *et al*⁽¹³⁾ and L.labban⁽¹¹⁾.but contrast result were observed in study doen by Majeed.⁽¹⁰⁾

In this study, 47.33% had taken high calorie food frequently. 40(48.2%) boys had taken slightly more frequent high calorie food then girls (46.3%). In a study done in university student of bangladesh by shatabdi goon *et al*⁽¹⁷⁾.prevalence of fast food consumption was 55.9% in males and 44.1% in females.

In this study, physical activity is inversely associated with body mass index. Similar finding were found in a study done by labban *et al* at damacus university⁽¹¹⁾.

In our study, Consumption of high calorie food was positively associated with BMI. Similar finding were found in a previous study by Shatabdi goon *et al*⁽¹⁷⁾ at university of Bangladesh, among Bangladeshi university students.

Limitations:

Limitations of our study are not to take the various factors of not doing physical activity and reason for consumption of high calorie food intake. We did not include the patients with habits like alcohol, cigarette consumption etc. furthermore, bias may be occur because of self-reporting dietary intake by subjects.

Conclusion:

This study throws light on physical activity, BMI and frequency of high calorie food intake among medical students and observes that sufficient physical activity is associated with normal BMI and insufficient physical activity is associated with overweight and obesity . It shows an inverse relationship between physical activity and BMI. So doing sufficient physical activity may reduce risk of being obese and its consequences. Similarly high calorie food consumption act as a risk factor for being overweight and obese shows positive relationship between diet and BMI.

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