

Review Article on Prevalence of Malnutrition in Medical Students

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ABSTRACT

Hunger issues are contributing to very disturbing factors of the recent trending issues of severe illness and early deaths such as severe heart problems, random sugar related problems and cysts leading for carcinomas. Identification of this illness at a very primitive stage can thereby reduce the load of medication costing and thus improve the chances at living a fit lifestyle in mere future. A result, the corresponding paper is focused on medical students from metropolitan cities as well as small towns. This review focuses on the study that aimed to assess the prevalence of nutritional status grades in medical students such as underweight, normal weight, overweight, and obesity, in first year medical students as well as other measurable anthropometric factors of body mass index (BMI) in students based on gender, lifestyle habits and living area. Nutrition is very important aspect which controls our health. Materials and methods: This research were directed in between 2020-2021 academic year, which consisted of undergraduates from all the academic years, by conducting an online question based form paper.

Result and Conclusion: Overweight/ obesity is more prominent in metropolitan students than in their counterparts living in non-metropolitan cities while prevalence of underweight was found more in non-metropolitan city students. Males were observed more prone to overweight than females when interpopulation comparison was done.

Key words: Hunger issues, Metropolitan cities, Body Mass Index (BMI)

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INTRODUCTION

Malnutrition is a serious condition which happens when your diet does not contain the correct amount of required nutrients to stay healthy. It means "poor nutrition" and can include under nutrition and over nutrition. Under nutrition means not getting enough nutrients and over nutrition means getting more nutrients than required for maintaining healthy body. Under nutrition occurs when not enough essential nutrients are consumed or when they are excreted more rapidly than they can be replaced. Overweight/over nutrition is a form of malnutrition results from energy intakes from food and beverages that exceed children's daily energy requirements. Overweight increases the risk of diet-related noncommunicable diseases later in life. Malnutrition is a major public health problem throughout the developing world

particularly in Southern Asia and Sub Saharan Africa [1-3]. In many of the developing countries, stunting, underweight, and micronutrient deficiencies among adolescents frequently result from inadequate nutrition and infections during early childhood combined with a diet insufficient to meet the intense nutritional demands of rapid growth during adolescence [4]. Malnutrition, with its 2 constituents of protein-energy malnutrition and micronutrient deficiencies, continues to be a major health burden in developing countries. Malnutrition in all its forms contains, under nutrition insufficient micro nutrients, being obese, and developing diet related diseases.

Adolescents are nutritionally very vulnerable due to their increased nutritional requirements for growth, eating patterns and their susceptibility to behavioural and environmental influences. Imbalance in nutrition in the adolescent age group can potentially affect the growth pattern and sexual maturation. Inadequate nutrition also subjected the adolescent age group at high risk of chronic disease although the detrimental effects might appear after a long time in adulthood. Among nutritional disorders, overweight and obesity are associated with the most frequent lifestyle diseases nowadays such as cardiovascular diseases, malignancies and diabetes and hypertension. This pattern of morbidity is common

in developed countries and it is expanding to other developing countries like India too.

One of the major causes for malnutrition in India is economic inequality in rural and urban areas. Due to the low economic social status of majority of the population, their diet often lacks in both quality and quantity. In general, those who are having poor economic status are at risk for under-nutrition, in India while those who are having high socio-economic status are relatively more likely to be over-nourished leading to overweight and its related complications in adulthood.

The Global burden of malnutrition has serious and long term developmental, economic, social, and medical consequences for individuals. In most developing countries, most of the studies are concerned with the nutritional status of under-five children and mother thus neglecting adolescents and adult population. Also it is observed that many of the nutrition initiatives have been focusing on children and women, thus neglecting adolescents and adult age groups. Addressing the nutrition needs of adolescents could be a very important step towards breaking the vicious cycle of intergenerational malnutrition, chronic diseases, diet related diseases mortality and morbidity associated with chronic diseases. Comparative to the general population, students are the most vulnerable and susceptible group to acquire a disordered lifestyle and bad health habits. For most students, this phase of lifetime period is the most challenging because of sudden change of the geographical and social environment in the context of the need to make efforts for preparing for the future and own profession. Out of all students' categories, the medical students are the most overloaded and stressed because of many exams along with the amount of knowledge needed to be acquired for medical training and the high level of stress. Hence the proposed study was to focus on the young medical students that aimed to assess the prevalence of nutritional status in first year medical students to create awareness not only underweight but also of overweight and obesity as young medical doctors who will be our future caretakers should be healthy. Additionally, study was designed to investigate the co-relation of residence and exercise on status of malnourishment (underweight/normal/overweight) in medical students.

Objectives

To investigate prevalence of malnutrition such as underweight, normal weight, overweight, and obesity, in first year medical students.

To establish if any relationship between malnutrition and residence (metropolitan Vs non-metropolitan city comparison).

Additionally, to check the status of exercise or physical activity habits in order to impart and assess the awareness level in medical students.

METHODS AND MATERIALS

The medical students were randomly selected who were willing to participate voluntarily and give consent to fill online questionnaire. The invitation was made during the teaching activities. After a brief presentation of the study, the link for the online questionnaire was provided to each responsible of the student's group and then disseminated to everyone.

Inclusion criteria was that the student were selected between age group of 18-19years to make the population comparable among the different groups. For the analysis, only the fully completed questionnaire forms were kept. The validation of the record of the data correctness was designed for the all included parameter in the structured format of the online form. The final validation and the rejection of incomplete forms was done in Microsoft Excel sheet software. After completion of data collection, data were thoroughly screened, reviewed, compiled and checked for its completeness, consistency and accuracy and data analysis was done as per the objectives of the study.

The total 150 students participated and data was analysed which included 84 male students and 66 female students. The questionnaire included items regarding the anthropometric measures (weight, height), personal characteristics (age, gender, marital status, type of residence, family history, diabetes etc), dietary history and exercise history, the academic year and performance, any habits like the alcohol intake, smoking etc. For maintaining the consistency of anthropometric measurements like height and weight, the participant students were informed and requested to use the same measuring tape and weighing machine available in the department of physiology to measure height and weight respectively throughout data collection period. The weighing machine and the measuring tape were calibrated on a regular basis against standard weighing machine and height measurement instrument. Body Mass Index (BMI) was calculated using standard Quetelet index as weight/height², with weight being in kilograms and height being in meters. Below is the table representing the standard classification according to Body Mass Index (BMI) for checking the nutritional or malnutrition status of the students (Table 1).

RESULTS

In this study, a total of 150 medical students fully completed online questionnaires. Those were analysed in Microsoft excel database representing below

Table 1: standard classification according to Body Mass Index (BMI).

| Classification | BMI (kilogram/m ²) |
|-------------------------|--------------------------------|
| Underweight | <18.5 |
| Normal weight | 18.5-24.9 |
| Overweight | 25-29.9 |
| Obesity Class 1 | 30-34.9 |
| Obesity Class 2 | 35-39.9 |
| Extreme Obesity Class 3 | >40 |

information (Table 2).

The medical students were selected between age group of 18-19years to make the population comparable among the different internal groups like gender distribution or residential distribution etc. However, the unequal distribution observed in participants was due to voluntary participation.

Among the total 150 medical students, 84 males and 66 females were participants while 80 students were resident of metro cities and 70 students were resident of non-metro cities.

Out of 80 metropolitan students, 46 were males and 34 were females. Out of those 80 metro city residents, 56 (70%) students were normal Body mass index, whereas 9 (11.25%) students were underweighting and 15 (18.75%) students were overweight. Out of 70 Non-metropolitan city students, 38 were males and 32 were females. Out of those 70 Non-metro city residents, 55 (78.57%) students were having normal BMI, 11 (15.71%) students were underweighting and 4 (5.72%) students were found overweight. The percentage of underweight students was more in non-metropolitan area (Figure 1). Below is the further analysis of Metropolitan Vs Non-metropolitan population with interpopulation comparison with respect to gender difference (Table 3).

Out of total 150 participants, 111 students were having

normal body mass Index (BMI), 20 students were found to be underweight and 19 students were found to be overweight as per BMI calculation mentioned in material and method. Thus, the overall prevalence observed for under nutrition is 20 (13.33%), overweight is 19 (12.66%) and normal healthy students were 111 (74%).

The prevalence of underweight was observed to be on higher side in Non-metro resident students with total of 11 students (including 5 males and 6 females). The percentage contribution of underweight non- metro city resident males was 13.15% as compared to metro city resident males with 10.86%. Moreover, the percentage contribution of non- metro city resident females was 18.75% as compared to metro city resident females with 11.76%.

The prevalence of Overweight was observed to be on higher side in metro resident students with total of 15 students (including 9 males and 6 females). The percentage contribution of Overweight metro city resident males was 19.56% as compared to non-metro city resident males with 5.26%. Moreover, the percentage contribution of metro city resident females was 17.64% as compared to non- metro city resident females with 6.25%.

The intergroup gender comparison showed that prevalence of underweight was more in females than males. The percentage contribution in non- metro city resident females was 18.75% in than males with 13.15% while in metro city resident females contribution was 11.76% than 10.86% males. However, for overweight comparison males were found more prone in metro cities with percentage contribution of 19.56% than females with 17.64%. Therefore, overall males were

Table 2: Distribution of study population.

| | Males | Females | Total |
|----------------|-------|---------|-------|
| Metro city | 46 | 34 | 80 |
| Non-metro City | 38 | 32 | 70 |
| Total | 84 | 66 | 150 |

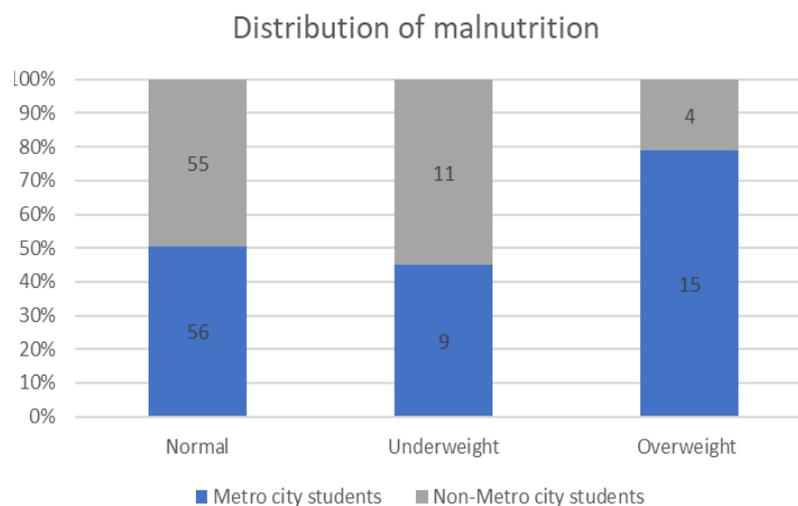


Figure 1: Distribution of malnutrition.

Table 3: Metropolitan Vs. Non-metropolitan population with interpopulation comparison with respect to gender difference.

| | Metro city Males | Metro city females | Non-metro City males | Non-metro City Females |
|-------------|------------------|--------------------|----------------------|------------------------|
| Normal | 32 (69.56%) | 24 (70.58%) | 31 (81.57%) | 24 (75.0%) |
| Underweight | 5 (10.86%) | 4 (11.76%) | 5 (13.15%) | 6 (18.75%) |
| Overweight | 9 (19.56%) | 6 (17.64%) | 2 (5.26%) | 2 (6.25%) |
| Total | 46 | 34 | 38 | 32 |

observed to be more prone for obesity/ overweight than females while underweight was observed to be more prone in females than males.

We could not establish the relevant association of exercise or daily physical activity with weight and obesity of students as only 22 students out of 150 were doing exercises which were also irregular. Therefore, considering the incomplete data, significant co-relation and relevant analysis could not be done. It was also observed the level of awareness about exercise or physical activity and its impact on health was very low although being medical students.

DISCUSSION

Malnutrition and under nutrition in children, in addition to obesity ailments, have imposed a double burden of nutritional disorders in parts of the developing world of emerging epidemiologic and demographic transitions. Malnutrition is more than just being underweight. It encompasses both nutrition and overeating. Under nutrition has been extensively researched, and extreme precautions have been taken to prevent undernutrition across the age groups.

The present study revealed that 13.33% of medical school going adolescents between the age of 18–19 years were underweight. The findings were similar to analysis of Demographic and Health survey 2008 in Ghana 2015 documented the lower prevalence of underweight 15.3% and 13.8% respectively among adolescent's years in Dang district Nepal [5,6].

However, the overweight students contributed to 12.66% in current observation which is found similar to cross sectional study [7] on prevalence of malnutrition in first year students.

The prevalence of obesity was found more in students of metro cities than non-metro cities in current study with increased tendency in males than females. Similar observation was found in study [8] which was focused to determine the prevalence of generalized, abdominal, and combined obesity in urban and rural India.

Rapid urbanization, use of mechanized transportation, increased availability of packaged foods, increased television viewing, adoption of less healthy and active lifestyles, and consumption of more "energy-dense, nutritionally poor" diets may all be significantly contributing to the rise in obesity prevalence in countries such as India. Overweight in urban centers is chiefly attributed by junk and high-calorie food consumption, as well as sedentary lifestyle and stress, whereas underweight can be induced by flawed food patterns.

Another study [9] noticed that the overweight and obesity in first degree manifested in almost one-third of male students, far exceeding the prevalence in women. While another study analysis between genders, the prevalence was higher for female adolescents in the region Lazio, Italy (24% females, 18% males), Oporto

(the reference population), USA (23.2% females, 16.5% males), while in Lisbon, Portugal 419 Original Research Clujul Medical Vol. 91, No.4, 2018: 414-421 (18.4% males, 15.8% females) and in the Turin area, Italy (24.2% males, 19.2% females) the prevalence was higher in male teenagers [10].

Obesity is a multifaceted, multifunctional chronic disease. Obesity is the most common form of malnutrition; it has become so common that it has supplanted the more traditional public health problem of under nutrition. According to multiple studies, the rate of obesity among youngsters ranges between 10% and 30%. Predominance varies across the country due to differences in lifestyle, particularly dietary trends and physical activity. One cultural belief that may lead to malnutrition is religion especially in India being multidivergent region. Among this influence of religions, one of the important factors especially in India are restricted from consuming any kind of meat. Additionally, other Indians are strictly vegetarian, which means, they do not even consume any sort of animal product, including dairy products and eggs. Therefore, all this led to a serious problem when inadequate protein is consumed because many of the poor Indian households especially in rural areas consume cereal to consume protein. As opposed rapid industrialization in Urban cities or metropolitan cities are the root drivers of the rise in the prevalence of childhood obesity leading to complications in adulthood [11,12].

The our study data has shown increased trend of under nutrition in non-metropolitan resident students as opposed to overweight prevalence which is observed more in metro cities which can be supported by Indian economical and urbanized status explained above.

We could not find any significant association of weight with exercise or physical activity as the contribution of students doing regular exercise was very low suggesting that level of awareness is very low in medical students.

For our youth population especially medical students, a better knowledge of the specific characteristics and the particular determinants of the nutritional status and its association with exercise are important factors to decide the necessity of an intervention program to make its nature as effective.

The important limitation of our current study was the limited sample size as it was determined by the students' reluctance to complete the online questionnaire and voluntary participation. The observed attitude, mostly represents the lack of practice in real life for filling questionnaires, or represents a lack of enthusiasm to participate for collecting data in order to investigate different aspects of community health problems. Especially for the participation rate in our study it was much lower than the expectations from the medical students considering the today's student population is known as digital generation, which usually currently use many electronic devices and systems. Another

concern which has raised is if the study's responders were significantly different from students who did not respond. However, this difference is really difficult to be established due to the online participation of filling questionnaire forms [13-15].

CONCLUSION

The nutritional disorders among participated medical students had different patterns of distribution according to living area, gender etc. Overweight/ obesity is more prominently observed in metropolitan city resident students than in their counterparts living in non-metropolitan resident students. However, the prevalence of underweight was found more evident in non-metropolitan city students. Overall males were observed to be more prone for obesity/ overweight than females while underweight was observed to be more prone in females than males when interpopulation comparison was done. The impact of exercise/ physical habits contributing towards healthy/ normal weight or obesity could not be established considering the limited data. However, the very low level of awareness was observed in the selected group of medical students.

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