Dietary habits among undergraduate medical students in Tamil Nadu; A Before and After Intervention study

Abstract:
Introduction: In a developing country like India, people suffer from poverty and hunger on one hand and other lifestyle related diseases on the other hand. Unhealthy lifestyle is especially common among affluent society. Non communicable diseases has a multifactorial causation and key modifiable risk factor for NCDs is obesity. Adolescent population tends to suffer from ill effects of obesity because of unhealthy eating habits and social factor like stress. This study aims to evaluate the life style pattern especially eating habits among undergraduate medical students and possible outcome of interventional program in the form of health education. **Methods:** A Before and After Intervention study was conducted among 100 undergraduate medical students in a private medical college of Tamil Nadu. Universal sampling method was used to select the study participants. A structured questionnaire was used to collect data from the study participants and Mc Nemar chi-square test was used for analysis. **Results:** The Percentage of students who were overweight was 23% and obese was 5%. It was estimated that 94% of the participants had habit of consuming outside food before intervention and when enquired about the frequency 13% consumed daily, 48% consumed twice or thrice per week, 28% monthly once and 11% had rare consumption of outside food. Mc Nemar test was done to compare consumption of healthy food among study participants before and after intervention and this association was found to be statistically significant. **Conclusion:** This study concluded that consumption of healthy food among study participants before and after intervention improved and association was statistically significant.

Key words*: Obesity, dietary habits*

Introduction:
India has witnessed a steady transition in health related ailments over past decades from infectious diseases to lifestyle related chronic diseases like Non-communicable Diseases (NCDs). In the year 2017, there was 61.8% mortality due Non communicable disease like diabetes, hypertension and cardiovascular diseases.[1] India being a developing country has to face, poverty, malnutrition and hunger on one hand and other lifestyle related diseases on the other hand, especially among affluent society because of urbanisation.[2] Non communicable diseases has a multifactorial causation and a key modifiable risk factor for NCDs is overweight and obesity. Obesity is defined as abnormal accumulation of body fat in a person causing negative effect on health. It is an imbalance between amount of calorie consumed and calorie expanded. According to NHFS -3 thirteen percent of women and nine percent of men between age group of 15 to 49 years are overweight or obese. WHO suggests that a person is said to be overweight when his BMI is more than or equal to 25 and obese when his BMI is more than or equal to 30.[3] It is a burning health problem more common among adolescents because of overconsumption of diet rich in fat, carbohydrates and salt1. It has been reported that the changes in body mass index (BMI) in the adolescents mainly reflect changes in muscle mass in males and fat volume in females.[4]

There has always been a consistent association between obesity in childhood and adolescence with increased risk of both premature morbidity and mortality, in particular cardio- metabolic morbidity and mental problems like mood disorder, motivational disorders, eating problems, impaired body image, interpersonal communication problems. Apart from health issues it carries an economic burden resulting in significant impact on health expenditures.[5] Adolescent population tend to suffer from ill effects of obesity because of unhealthy eating habits and social factor like stress. They are also the most vulnerable population because of an increased peer group influence. India has committed to achieve the WHO global NCD targets by 2025, and the Sustainable Development Goals by 2030, to achieve this goal it is necessary that utmost steps should be taken to reduce risk factors starting right from adolescent age group.[1] This study aims to evaluate the life style pattern especially eating habits among undergraduate medical students and possible outcome of interventional program in the form of health education.

Study Methodology:

A Before and After Intervention study was conducted among 100 first year undergraduate medical students in a private medical college situated in Chengalpet district of Tamil Nadu. Universal

sampling method was used to select the study participants and an informed consent was obtained to initiate the study. All students with no history of any health ailments like diabetes, hypertension and cardiac problems were included in the study. A structured questionnaire with four sections was used to collect data from the study participants. First section of the questionnaire was general information of the study participants, second section was about the prior behaviour of participants with regards to eating habits, third section was about affect related behaviour (After following healthy eating pattern) and fourth section was about commitment to action in following days.

There were a total of 11 questions and most of the questions were in the form of yes or no. These questions were pilot tested and reviewed by experts for validity. On the first day of data collection questions on general information and prior behaviour were obtained, following this the students were given an audio visual session on the importance of healthy lifestyle and eating habit. They were explained in detail about the health benefits associated with various food items and importance of consuming a balanced diet. The students were re-visited in their respective class rooms after a month and questionnaire containing section three and four questions were administered. The data collected was entered in excel sheet and analysis was done by using IBM SPSS Software. Chi square test was used to test association between variables and Mc Nemar test was used to compare eating habits before and after intervention.

Result:

Out of the hundred medical undergraduate students who were willing to participate in the study, 31 (31%) were males 69 (69%) were females. To estimate prevalence of overweight and obesity among the students data regarding height, weight and BMI were obtained under general information section in the questionnaire. Accordingly mean height of the participants was 162.6cm, mean weight was 60.65kg and mean BMI was 22.74. Based on the BMI, Percentage of students who were overweight was 23% and obese was 5%, this is depicted in [Figure 1].

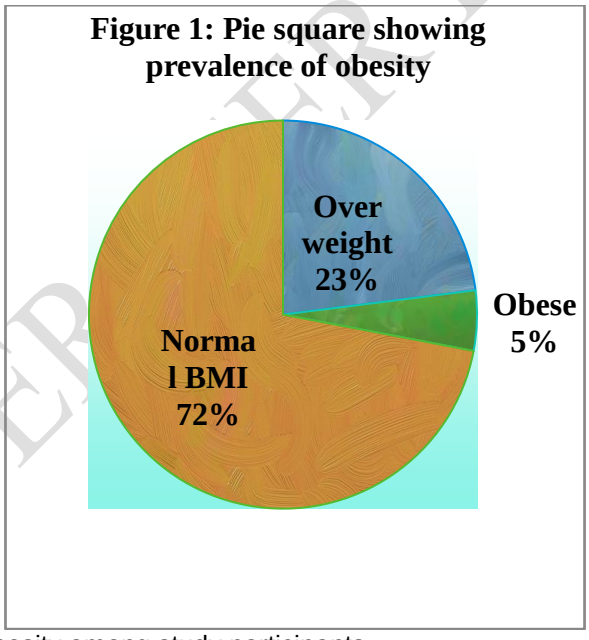

Figure 1: Prevalence of obesity among study participants

Before starting the intervention in the form of health education on healthy diet and living, prior behaviour of the participants were estimated in the form of few open ended questions. 94% of the participants had habit of consuming outside food before intervention and when enquired about the frequency 13% consumed daily, 48% consumed twice or thrice per week, 28% monthly once and 11% had rare consumption of outside food. There was a statistically significant association between obesity and eating habits (consumption of outside food) and eating habits and ability to lead healthy life on chi square analysis. McNemar test was done to compare consumption of healthy food among study participants before and after intervention and this association was found to be statistically significant. Before intervention and after intervention 79% had continued to consume healthy diet and 15% of them who consumed unhealthy diet before intervention changed their dietary habits to healthy eating after intervention. It was also noted that 96% have understood the importance of healthy food.

Nearly 94% of the participants were ready to follow healthy diet in future and 91% were willing to take measures to reduce junk food consumption. The result of this study suggested that health education on dietary habits and healthy living among study participants proved to be effective in improving their lifestyle.

Table 1: Chi square test showing Association dietary habits and classification of obesity

Variables		classification of obesity (BMI)			Total
		Normal	overweight	obese	
Dietary habit	good	68	23	3	94
	poor	4	0	2	6
Total		72	23	5	100

Association was statistically significant :P value 0.003*

Table 2: Mc Nemar test: Comparison of dietary habit before and after intervention

Variables			Dietary habit after intervention (Post test)		Total
			good	poor	
Dietary habit prior intervention (Pre test)	good	Frequency	79	2	81
		% within before	97.5%	2.5%	100.0%
		% within after	84.0%	33.3%	81.0%
	poor	Frequency	15	4	19
		% within before	78.9%	21.1%	100.0%
		% within after	16.0%	66.7%	19.0%

Association was statistically significant : P value 0.002*

Discussion:

There has been several studies on prevalence of obesity, Intervention in many studies were done to rule out associated factors of obesity, this study was done to estimate the outcome of an interventional program. Few previous studies are discussed subsequently, an interventional study done by Sharareh Haghani et al[6] on two different overweight elementary school students in Iran using a lifestyle and physical activity questionnaire suggested a significant difference in general lifestyle score and nutrition score between the two groups ($p< 0.001$) following tailored health education program. Results were similar to the present study were there was a significant association between dietary habit before and after intervention. This suggested that there has been an improvement lifestyle following an appropriate health education irrespective of age group.

Karl Peltzer et al[7] studied Prevalence of Overweight/Obesity and Its associated factors among University students from 22 Countries. It was a cross sectional study which suggested that 22% of students were either overweight or obese and on multivariate regression physical inactivity, current tobacco use, post-traumatic stress were the associated factors for overweight or obesity. In this study overall prevalence of overweight was 23% and obesity was 5%. An effective interventional program could be helpful as there is a risk that 23% of students who are overweight could become obese in future.

A study by Varsha Shah et al[8] on the impact of educational intervention regarding hazards of obesity and its preventive measures among students in Ahmedabad city showed prevalence of obesity to be 10.2%. The Baseline knowledge regarding preventive measure of obesity like avoiding junk food/ healthy diet, exercise and meditation was 23.6%, 24.4% and 25.9% respectively and this increased significantly following intervention as 95.3%, 96.9 and 97.4% respectively. In the present study 94% of the participants were ready to follow healthy diet in future and 91% were willing to take measures to reduce junk food consumption. Lakshmi Sivashunmugam and Reshma M Ansari[9] in their study on Prevalence of Obesity and Overweight among second year students in a Malaysian Medical University showed prevalence of 23 (25%) who were overweight and 21 (22%) who were obese. On Pearson correlation analysis the variables BMI and WC had strong correlation with each other. The questionnaire which they used identified gaps in the knowledge of the students and a poor perception among overweight students. In our study nearly 81% had knowledge about nutritious food and healthy living. Even though, the study participants were medical undergraduate students with better knowledge about healthy diet, only 11% rarely consumed outside food.

Germine El-Kassas and Fouad Ziade[10] studied dietary and lifestyle behaviors, weight status and their self perceptions among Health Sciences University students in North Lebanon. It was a cross-sectional survey conducted among 369 health sciences students aged 18–25 chosen from four public and private universities in North Lebanon. The overall prevalence of overweight and obesity were 32.2% and the dietary consumption patterns according to this study fell below recommended levels. Multivariate regression analysis showed that parental obesity, comfort eating, increased appetite, food cravings, and stressful eating as associated risk of obesity. This study also suggested specific intervention programs which will enable students to improve their dietary and lifestyle behaviours and control stress among students. The present study also identified few risk factors for unhealthy food and lifestyle like students staying away from home, peer pressure and stress. Ravi Shekhar et al[11] studied Lifestyle and body mass index among students of a nursing college in Bihar and found overall prevalence of 32.6% and 9.4%being overweight and obese. 54.5% of the students used to skip breakfast and 91.8% students consumed junk food. In present study, 13.9% had habit of quitting breakfast and 94% had habit of consuming outside food. Another study done by Natalija Smetanina et al[12] on prevalence of overweight/obesity in relation to dietary habits and lifestyle among 7–17 years old children and adolescents in Lithuania showed obesity was significantly more prevalent in the 7–9 years old group (6.7 and 4.8 % in boys and girls, respectively. Skipping breakfast was directly associated with overweight/obesity but however, physical inactivity was not associated with higher BMI.

Another similar study by Kirti Deshpande et al[13] on lifestyle and obesity among college students in Ujjain suggested that nearly half (44.9%) of the students were either overweight or in obese category. 68% students had central obesity and more than 90% were frequent fast food eaters, eat between meals and were not interested in regular physical activity. C Kalaivani Ashok and S Karunanidhi[14] studied Prevalence of overweight and obesity among young female college students in Chennai city. From this study assessment of BMI indicated that only half the number of female college students (54.8%) had normal weight and quite a few students were either overweight (13.2%) or obese (5.2%). Mean energy intake of the students was 1828 kcal which was lower than the Indian Council of Medical Research recommended values and average intake of fruits, leafy vegetables, and other vegetables were also found to be low.

The results of study done by Doaa M Genena et al[15] on obesity and eating habits among university students in Alexandria suggested that 28.9% of the students were overweight and 11.8 % were obese. Eating habits of the students showed that nearly 80% were taking meals irregularly, 45.7% reported eating two meals per day and 57.6% of female students reported eating breakfast daily or three to four times per week compared to 55.3% male students. Two third of the student were taking snacks daily or three to four times per week. Hence from these studies, it becomes clear that late adolescent age group is most vulnerable group to obesity because of psychological transition from influence of the society with which they tend to interact, in their stressful life they don't worry about their diet and its importance. It is essential that this group of population must be given adequate knowledge about the after effect of consuming unhealthy diet.

Conclusion:

This study concluded that consumption of healthy food among study participants before and after intervention improved and association was statistically significant. Most of the health interventional programs are being directed towards maternal and child health and there are not much programs to address problems faced by adolescent population. Adolescents must be educated that eating habits and healthy lifestyle is an essential element to lead a socially and economically productive life free of disabilities.

COMPETING INTERESTS DISCLAIMER:

Authors have declared that no competing interests exist. The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

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