# Assessment of knowledge about obesity among students in a medical college in Kancheepuram district, Tamil Nadu

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## ABSTRACT

**Introduction:** Overweight and obesity are the fifth leading risk for global deaths. It is not only the degree of excess fat that is important, but also its distribution in the body that determines the health risks associated with the condition. The aim of the study is to assess the knowledge of medical students pertaining to obesity.

**Methods:** A cross-sectional descriptive study was conducted among first-year medical students in March of 2013. A universal sampling method was employed, and all first-year students were included as subjects in the study. The total sample included 138 students. After obtaining informed consent, a pre-tested semi-structured questionnaire was administered to each of the participants. Utmost care was taken to maintain privacy and confidentiality. Statistical analysis was done using SPSS version 17. Frequency distributions and percentages were calculated for all the variables.

**Results:** A lack of physical activity and the presence of stress were identified as the most common risk factors for obesity development. Approximately, 73(52.9%) students were of the incorrect opinion that gynaecoid obesity was more dangerous than android obesity. The most common strategy cited by 107(77.5%) respondents for prevention of obesity was regular exercise.

**Conclusion:** The study revealed that although the majority of the medical students were aware of the risk factors of obesity, many gaps, which need to be bridged, were identified in their knowledge. These medical students could be actively involved in awareness campaigns for delaying the onset of lifestyle diseases.

**Keywords:** obesity, body mass index, physical activity, cancer

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## INTRODUCTION

Demographic, economic, social, and nutritional transitions that occurred in the past decades shifted public health paradigms worldwide in the form of growing prevalence of overweight and obesity in virtually all age groups [1]. Overweight and obesity are defined as abnormal or excessive fat accumulation that may impair health. It is not only the degree of excess fat that is important, but also its distribution in the body that determines the health risks associated with the condition. Overweight and obesity are the fifth leading risk for global deaths. At least 2.8 million adults die each year as a result of being overweight or obese [2]. The prevalence of obesity has nearly doubled between 1980 and 2008. 65% of the world's population lives in a country where overweight and obesity kills more people than underweight. This includes all high-income and middle-income countries. In addition, 44% of the diabetes burden, 23% of the ischemic heart disease burden and between 7% and 41% of certain cancer burdens are attributable to overweight and obesity. In 2011, more than 40 million children under the age of five were overweight [3]. Once considered a high-income country problem, overweight and obesity are now on the rise in low- and middle-income countries, particularly in urban settings.

More than 30 million overweight children are living in developing countries and 10 million in developed countries [2-4].

World Health Organization (WHO) defines overweight as a BMI equal to or more than 25, and obesity as a BMI equal to or more than 30 [2]. An increased consumption of highly calorific foods, without an equal increase in physical activity, leads to an unhealthy increase in weight. Decreased levels of physical activity will also result in an energy imbalance and lead to weight gain [2].

Despite the recognition of obesity as a public health concern, it has been observed that understanding about multiple factors influencing a person's risk is still inadequate [5]. Studies have highlighted the role of variable socio-economic factors in the process of development of obesity [6, 7]. To have an insight regarding people perceptions in relation to obesity qualitative studies also have been conducted [8 - 10].

Curbing the global obesity epidemic requires a population-based multi-sectoral, multi-disciplinary, and culturally relevant approach. Individual responsibility can be assessed collectively only where people have access to a healthy lifestyle, and are supported to make healthy choices. WHO emphasizes on the need of mobilization of stakeholders who can play a vital role in shaping healthy environments and making healthier diet options affordable and easily accessible. "WHO Action Plan for the Global Strategy for the Prevention and Control of Non-communicable Diseases" provides a roadmap to establish and strengthen initiatives for the surveillance, prevention and management of non-communicable diseases, including obesity in low- and middle -income countries and its serious implications for poverty reduction and economic development [11].

In a study to assess the nutritional and health status of medical students at a university in Northwestern Saudi Arabia, it was observed that overall, 34.5% of the students were overweight, and 10.3% were obese [12]. Similarly in a study to estimate the prevalence of overweight and obesity among medical students in Malaysia, it was revealed that out of 290 students who participated in the study 14.8%, 15.9% and 5.2% were overweight, pre-obese and obese respectively [13]. Medical students are the future health care providers for the community. They are from different educational backgrounds with a scientific base and have an inherent inclination to serve mankind. The sensitization of medical students early in their courses will not only facilitate better adoption of healthy lifestyles among themselves but will also play a significant role in influencing masses to adopt healthy lifestyles in future years. With this background, they were enrolled in the study with the objective of assessing their knowledge pertaining to obesity (viz. risk factors; diagnosis; management and prevention measures).

## MATERIALS AND METHODS

A cross-sectional descriptive study was conducted among first-year medical students of a medical college in Kancheepuram district of Tamil Nadu. The study was conducted in the month of March 2013. The study population included medical students belonging to different regions of the country with varied socio-cultural practices and/or source of influence / knowledge. The total sample included 138 students. Majority 94(68.1%) of the medical students were 18 years of age while the maximum age recorded was 20 years. From a gender perspective, 80(58%) were males and 58(42%) were females. Most of the respondents 98(71%) were belonging to different states of the country other than Tamil Nadu in which medical college was located and were from urban pockets 119(86.2%) of the country. A universal

sampling method was employed, and all first-year students were included as subjects in the study

**Inclusion criteria:** All first year medical students who were present at the time of study and were willing to participate in the study were included as the study subjects.

**Exclusion criteria:** All those who refuse to give informed consent or were absent during the study period were excluded from the study. Total sample size for the study was 138.

The questionnaire was first pilot-tested among the 32 medical students of the second year and based on the results the questionnaire was appropriately modified. After obtaining informed consent, a pre-tested semi-structured questionnaire was administered to each of the participants. The questionnaire included several domains of questions including on their socio-demographic details, knowledge about various aspects of obesity including the definition, causative factors, types of obesity, formula for calculation of BMI, various medical conditions and cancers associated with obesity and management of obesity. None of the medical students refused to participate in the study and thus all of them returned back the questionnaire after responding to all the questions.

**Ethical considerations:** Written informed consent was obtained from the study participants before obtaining any information from them. Utmost care was taken to maintain privacy and confidentiality. Students were assured that results of the study will have no impact on their academics.

**Data analysis:** Data entry and statistical analysis was done using SPSS version 17. Frequency distributions and percentages were calculated for all the variables.

## RESULTS

Out of 138 first year medical students, 80(58%) were males and 58(42%) were females. Majority 94(68.1%) of the respondents were 18 years of age. The maximum age recorded among the study participants was 20 years. Table 1 gives the details about socio-demographic information of the study participants. Almost 120(87%) subjects were Hindu by religion. Most of the respondents 98(71%) were belonging to different states of the country other than Tamil Nadu in which medical college was located. Furthermore, majority 119(86.2%) of them were from urban pockets of the country.

Table 2 shows the knowledge of the respondents with regards to obesity. It was observed that only 22(15.9%) respondents were able to define obesity correctly. Majority of the respondents 73(52.9%) were of the incorrect opinion that gynaecoid obesity was the most dangerous type of obesity. About half of the respondents correctly identified breast cancer and colon cancer as the cancers associated with obesity.

**Table 1.** Socio-demographic parameters of the respondents.

| Socio-Demographic parameters | | Male (%) | Female (%) | Total (%) |
|---|---|---|---|---|
| Religion | **Hindu** | 69(57.5%) | 51(42.5%) | 120(100%) |
| | Muslim | 2(50%) | 2(50%) | 4(100%) |
| | Christian | 9(64.3%) | 5(35.7%) | 14(100%) |
| Father education | Illiterate/Primary/Middle school | 4(80%) | 1(20%) | 5(100%) |
| | High school | 6(54.5%) | 5(45.5%) | 11(100%) |
| | Post high school | 8(47.1%) | 9(52.9%) | 17(100%) |
| | **Graduate** | 32(54.2%) | 27(45.8%) | 59(100%) |
| | Postgraduate | 30(65.2%) | 16(34.8%) | 46(100%) |
| Father occupation | Skilled | 46(52.9%) | 41(47.1%) | 87(100%) |
| | Professional | 34(66.7%) | 17(33.3%) | 51(100%) |
| Mother education | Illiterate | 4(100%) | 0 | 4(100%) |
| | Primary & Middle school | 2(100%) | 0 | 2(100%) |
| | High school | 6(46.2%) | 7(53.8%) | 13(100%) |
| | Post high school | 13(59.1%) | 9(40.9%) | 22(100%) |
| | **Graduate** | 31(50.8%) | 30(49.2%) | 61(100%) |
| | Postgraduate | 24(66.7%) | 12(33.3%) | 36(100%) |
| Mother occupation | Skilled | 8(61.5%) | 5(38.5%) | 13(100%) |
| | Professional | 20(58.8%) | 14(41.2%) | 34(100%) |
| | **Housewives** | 67(73.6%) | 24(26.4%) | 91(100%) |

**Table 2.** Knowledge of the respondents on various aspects of obesity.

| **Parameters** | | **Number (%) [n=138]** |
|---|---|---|
| Percentage of fat in daily total calorie intake | **30% or less** | **62(44.9%)** |
| | 30%–60% | 48(34.8%) |
| | 60% or more | 6(4.4%) |
| | Daily fat intake percentage does not carry much of importance if you are walking everyday | 22(15.9%) |
| Definition of obesity | A medical condition in which excess body fat has accumulated to the extent that it may have an adverse effect on health | 23(16.7%) |
| | A disease in which fat has accumulated in body to the extent that it may have an adverse effect on health | 21(15.2%) |
| | **A physiological condition in which body fat has accumulated to the extent that it causes an adverse effect on health** | **94(68.1%)** |
| Risk factors for obesity | Insufficient sleep / stress | 45(32.6%) |
| | **Lack of physical activity** | **55(39.9%)** |
| | All psychiatric illness | 18(13%) |
| | Genetic susceptibility | 20(14.5%) |
| Dangerous type of obesity | Android | 11(8%) |
| | **Gynaecoid** | **73(52.9%)** |
| | **Don't know** | **54(39.1%)** |
| Formula for body mass index | **Correct response** | **79(57.2%)** |
| | Incorrect response | 59(42.8%) |
| Conditions associated with obesity | Diabetes | 16(11.7%) |
| | Hypertension | 11(8%) |
| | Cancer | 18(13%) |
| | Diabetes + Hypertension | 71(51.4%) |
| | **Diabetes + Hypertension + Cancer** | **22(15.9%)** |
| Cancers associated with obesity | Breast cancer / Colon cancer | 66(47.8%) |
| | **Pancreatic cancer / Renal cancer** | **72(52.2%)** |

Table 3 shows the opinion of respondents pertaining to diagnosis and management of obesity. It was observed that most of the respondents 76(55.1%) and 71(51.4%) were of the opinion that obesity has to be diagnosed in laboratory and can be treated surgically.

Table 4 shows the opinion of respondents regarding prevention of obesity. The most common cited by the respondents for prevention of obesity was regular exercise by 107(77.5%) followed by dietary modifications and yoga/meditation by 74(53.6%) and 52(37.7%) of the respondents respectively.

**Table 3** Opinion of respondents about diagnosis and management of obesity.

| **Parameters [n=138]** | **Correct response (%)** | **Wrong response/ Don't know (%)** |
|---|---|---|
| Obesity must be diagnosed in a laboratory | 76(55.1%) | 62(44.9%) |
| Lifestyle modification is an important aspect in management of obesity | 102(73.9%) | 36(26.1%) |
| Obesity can be treated by surgical methods | 71(51.4%) | 67(48.6%) |

**Table 4.** Opinion of respondents regarding prevention of obesity.

| **Response*** | **Number (%)** |
|---|---|
| Dietary modifications | 74(53.6%) |
| **Regular exercise** | **107(77.5%)** |
| Yoga / meditation | 52(37.7%) |
| Regular health check-ups | 47(34.1%) |
| Management of stress | 35(25.4%) |
| Others | 19(13.8%) |

*Responses are not mutually exclusive

## DISCUSSION

The present study assessed the knowledge of the first year medical students regarding different aspects of obesity viz. risk factors; diagnosis; management and prevention measures with the help of a semi-structured questionnaire. Similarly in a study done among children in Korea obesity-related attitudes, knowledge, and eating behaviors was assessed [14].

In a study done among adolescents, it was concluded that low-income obese adolescents perceive obesity as a heritage, caused by family genes, side effects of medication use, and stressful life events [15]. In other study findings, adoption of harmful lifestyle factors was cited as the more common cause than environment / genetics factors for obesity development [16,17]. In a systematic review done with an aim to ascertain the early-life determinants of overweight and obesity, factors such as maternal diabetes/smoking, inadequate breastfeeding, obesity in infancy, less sleep, <30 min of daily physical activity, consumption of sugar-sweetened beverages were found to be associated with overweight and obesity in the later life [18]. In-fact even an ecological study has been performed to assess the relationship between social and environmental determinants of obesity [19]. However in the present study, lack of physical activity was reported as the most common risk factor cited by the respondents followed by insufficient sleep.

Majority 72(52.2%) of the students of the present study wrongly reported that pancreatic and renal cancers are associated with obesity. However in a study performed in China, obesity was the identified as one of the risk factors for development of breast cancer [20]. In a population-based prospective cohort study conducted among hospital patients in Sweden, obesity was found to be a causal factor for cancers of the small intestine, colon and gallbladder [21].

In the current study, when students were enquired about measures for prevention of obesity, 107(77.5%) respondents cited regular exercise is the best strategy followed by dietary modifications by 74(53.6%) respondents. Similar results were obtained in a systematic review [22]. However, in a study done in Germany it was reported that the intensity of physical activity played a critical role independent of age and gender in prevention of obesity [23]. Also, in a cross-sectional study conducted among the school children, physical activity (moderate / vigorous) was found to be an important determinant of obesity in children [24]. In a study conducted among Mexican women it was concluded that having poor nutritional knowledge is a direct predictor for development of obesity [25]. In a cluster randomized controlled trial conducted in school settings of France for a period of two years it was reported that the intervention group which has been exposed to prevention strategies (viz. diet education; physical activity; and screening and care) had lower increase in BMI and greater decrease in overweight/obesity prevalence than the control group [26].

The study had its limitations in the form that it was an institution-based study and thus results obtained from the study cannot be generalized to a specific community as the respondents were from varied geographical regions of the nation. In addition, involving all the students of the medical college could have given much more comprehensive results.

## CONCLUSION

The study revealed that though majority of the medical students were aware about the risk factors of obesity there were many gaps identified in their knowledge which needs to be bridged. Regular exercise was cited as the most common measure for prevention of development of obesity. Results of the study implicate that there is an immense need to promote healthy lifestyles among the medical students for avoiding the premature onset of the lifestyle disorders. These medical students could also be actively involved in awareness campaigns for delaying the onset of lifestyle diseases among the community.

**Conflicts of interest:** None to be declared.

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