PHYSICAL ACTIVITY AND BMI OF MEDICAL STUDENTS AT REHMAN MEDICAL COLLEGE, PESHAWAR

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ABSTRACT

Introduction: Individuals are predisposed to obesity and overweight by sedentary life styles and lack of physical activity. The deskbound life style is also known to track from childhood into adulthood with consequent cardiovascular and metabolic problems. This study aimed to describe the frequency of physical activity and the relationship between physical activity and body mass index of first year MBBS students at Rehman Medical College, Peshawar Pakistan.

Material & Methods: A descriptive study was conducted in 2011 to collect data of first year MBBS students regarding their body mass index and habitual physical activities. A total number of 54 students participated in the study. Data were collected on a self-reporting questionnaire regarding their physical activity while heights and weights were measured using weight machine and measuring tape. Finally correlation was obtained for students BMI and regular physical activity.

Results: Out of 54 students, 9(17%) were involved in vigorous activities on regular basis. About 50% of them were using bicycle or walking for at least 10 minutes continuously to get to and from places. Overweight and grade 1 obesity was seen in 13% (75% of male and 25% of female), and 8% (86% of male and 14% of female), respectively. Leisure time, physical activity (duration of typical working day, walking, cycling etc) were inversely associated with body mass index. A steady increase in BMI was noticed among students whose recreation, sport or leisure time involved mostly sitting, reclining, or standing, with no physical activity ($r = 0.5$, $p = 0.001$).

Conclusion: A physically active life style and regular involvement in moderate physical activities like cycling and walking maximizes the chances of having normal body weight, while sedentary life style with less physical activities may result in increased body weight of medical students.

Key Words: Body Mass Index; Physical exertion; Sedentary lifestyle; Obesity; Overweight.

INTRODUCTION

Obesity and overweight became the emerging public health problems in both developed and developing countries (1-3). Overweight or underweight status is also linked with the dietary pattern and physical activity of an individual. Underweight condition is annoying because of its association with malnutrition of individual during their childhood period (4,5). Similarly sedentary lifestyles or physical inactivity, on the other hand, are a major underlying cause of overweight and obesity (6). Obesity in turn, relates to numerous mental and health problems such as type 2 diabetes, hypertension, cardiovascular diseases, depression, low self-esteem and skin problems (4,5,7,8). On the other hand, physical fitness is strongly linked with regular participation in physical activity which in turn is associated with a reduced risk of premature mortality, coronary heart disease, hypertension, cancer, type 2 diabetes, obesity, emotional stress and depression (6,9).

Nearly 2 million deaths occur in the world every year attributable to physical inactivity (10). In developing countries due to scarce health resources and poor infrastructure the consequences of obesity are likely to be worse. In this regard, a potential emerging public health concern in developing and

developed countries is likely to be the increasing incidence of childhood and adult overweight, which in the future is likely to create an enormous public health burden (11). According to Popkin et al the prevalence of obesity in developing countries ranges from 7% to 10% (12,13). Obesity/overweight rates tend to increase among young people and middle-aged adults. Such type of shift in prevalence of obesity is linked with lack of leisure time physical activity, inactive/deskbound lifestyles, spending of time on watching television, using computers and passive modes of transport such as cars and buses (14). Apart from those factors obesity or underweight are also linked to socio-economic and socio-cultural status of an individual (15).

The health, social and economic status of a population can be well-described with the observed development of different anthropometric variables (15). From the genetic and environmental conditions (development of public health, quantity and quality of nutrition, hygiene), which determine body dimensions, regular physical activity become more and more important. Unfortunately, the quantity of physical activity is continuously decreasing and its reduced amount can be observed in the developing generation (15). The relationship between physical hypo-activity and the increase of body mass index is proved. Obesity as a risk factor for most of the non-communicable diseases is well-known, thus the importance of prevention and treating of obesity is evident (15).

Body Mass Index (BMI) is a simple indicator of weight-for-height that is a most cost effective tool and commonly used to classify underweight, overweight and obesity in adults (16). It is cost effective as compared to direct measures of body fat (e.g. skin fold measures, underwater weighing) (17,18). It is the ratio of an individual's weight to height squared (kg/m^2), and it is used to estimate risk of weight-related health problems. BMI measures excess body weight for a particular height (17). It is not a direct measure of body fat but has been shown to correlate with body fat (18-20). A BMI measurement is relatively easy, inexpensive, noninvasive, and quick (17,18). Although it does not provide the final diagnoses, it can be used as a screening tool to identify individuals who need to be inspected further by a medical care provider to obtain an informed diagnosis (21).

Rationale of study: Apart from awareness about the importance of physical activity, high burden of work compels the medical students on spending deskbound life style. Literature is also evident that physical activity level among medical students remained poor especially among the female students (24). No study has been conducted in our region in this regards, thus justifying the present research.

Aim of the study: The aim of this study was to identify medical students of RMC at risk for overweight and obesity due to lack of required physical activities.

Objectives of the study:

1. To determine the BMI and self-reported physical activities among the first year MBBS students at RMC.
2. To correlate BMI with level of habitual physical activities among the first year MBBS students at RMC.

MATERIAL & METHODS

This study was conducted on the first batch of medical students at Rehman Medical College (RMC) Peshawar during April to August 2011. The activities during the study period included proposal writing, data collection, data analysis and report writing.

It was a descriptive study meant to document the BMI and physical activity habits of first year medical students of RMC.

The universal sampling approach was adopted to invite all 100 students of first year MBBS to take part in the study. Students who did not consent to the study were not included.

Data Collection

Data were collected on a self-reporting questionnaire regarding their habitual physical activity while heights and weights were measured independently by the researchers using a standard weight machine and a measuring tape. The questionnaire was designed such that it took only 10-15 minute to be filled. The participants were requested to fill it on the spot and return it. For quality assurance the questionnaire were checked for completion. In case of any incomplete questionnaire, participants were traced and requested to answer every question honestly and to the best of their knowledge.

Categorization of Body mass index

Body weights and heights were measured from the subjects independently by research team members. The body mass index (BMI) was calculated (bodyweight in kg / height in meter squared) and classified according to World Health Organization standards into the following categories: Underweight <18.5, Normal 18.5-24.9, Overweight 25.0 – 29.9, Grade 1 Obesity 30.0 – 34.9, Grade 2 Obesity 35.0 – 39.9, Grade 3 Obesity ≥ 40.0 kg/m^2 (25).

Data Analysis: Data were analyzed using SPSS version 15.0. For continuous data, mean and standard deviation were calculated. The habitual physical activities were displayed in term of frequencies and percentages. Pearson's and Spearman's correlation were done for BMI and physical activity.

Ethical Considerations

Approval for the study was granted by the Research Ethics Committee of Rehman Medical Institute.

RESULTS

A total 54 students with ratio of 33(61.10%) males to 21(38.90%) females participated in the study. Most of them (41, 75.90%) were from urban areas. The ages of participant ranged from 18-21 years (34, 63% aged 19 years; 20, 37% aged 20-21 years) with a mean age of 19.2 ± 0.77 years. Most (38, 70%) of their parents / guardians were working in government or private sectors, while 16(30%) were self-employed.

Body Mass Index ranged from 14.6-34.1 with a mean of 22.2 ± 4.8 kg/m. Under-weight and normal-weight were 20%, (28% of males and 72% of females), and 59% (66% of male and 34% female), respectively. Overweight and grade 1 obesity was seen in 08% (75% of males and 25% of females), and 13% (86% of males and 14% of females), respectively (table 1).

Table 1: Categories of relative weight cross tabulated by gender

Categories of Relative Weight	Total (n=54) n (%)	Males (n=33) n (%)	Females (n=21) n (%)	P value
Underweight	11 (20)	03 (28)	08 (72)	
Normal	32 (59)	21 (66)	11 (34)	
Overweight	04 (08)	03 (75)	01 (25)	0.05
Grade 1 Obesity	07 (13)	06 (86)	01 (14)	

Relative body mass were compared with physical activities of students which included data of vigorous activities in a typical day and week as well as the length of their typical working day. BMI was also correlated with the way they used to travel to and from places i.e. means of traveling (walking, cycling) to work, college, shopping, the field, market, mosques, and gatherings. Furthermore, the BMI of students were compared with sitting or reclining time at work, at home, in leisure. Sitting and reclining included time spent sitting at a desk, visiting friends, reading, or watching television, but not the time spent in sleeping.

Approximately 45(83%) of the participants reported that vigorous activities were not part of their routine work at home. The frequencies of vigorous activities reported by students ranged from 1-7 days per week; however only 3% reported that they did heavy work on a daily basis. Similarly half of the students reported that they often walked or used bicycle during their daily life. About 44% students reported that for 5-7 days a week, walking or cycling remained part of their routine activities. On the other hand 30(56%) students reported that their recreation, sport or leisure time involved mostly sitting, reclining, or standing, with no physical activity lasting more than 10 minutes at a time.

Vigorous activities on weekly basis were not linked with decrease or increase in BMI. But the students who performed vigorous activities on daily basis were less likely to be obese than those students who were not involved in heavy work as regular part of their day to day life. In the same way long working day had inverse relationship with BMI. A decreased body mass index was observed among the students whose working time of typical day was long, but still it was not significant ($r = -0.130$, $p = 0.349$) (see fig 1).

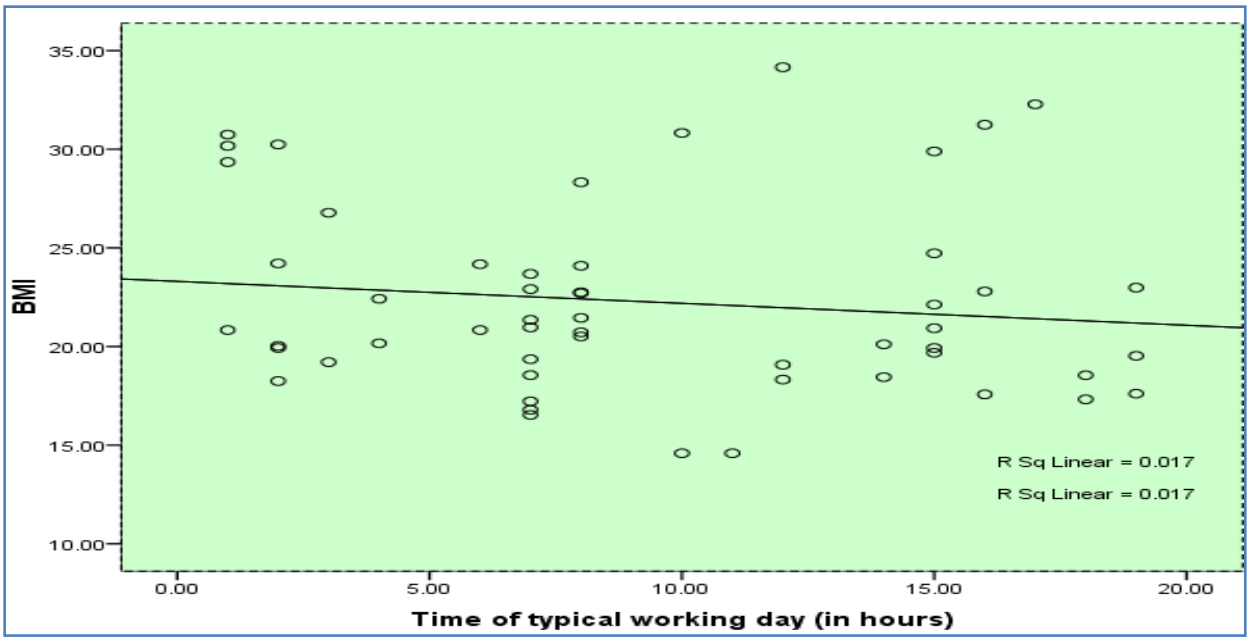

Figure 1: Correlation between BMI and typical working time/day

The association of BMI and cycling and walking were inversely related. A decreased BMI was seen among those students who were walking or cycling on regular basis. Results

reflect that the more the time they passed on cycling or walking the lower was their BMI, however statistically it was not significant (r=-0.49, p=0.72). This relationship was likely seen among groups of students who were habitual of cycling or walking. Such finding was not seen among those students who were irregular in cycling and walking. A similar association has seen between regular based moderate activities and BMI. Duration of moderate activity on regular basis has shown negative association with BMI (r = - 0.62, 0.72).

A steady increase in BMI was noticed among students whose recreation, sport or leisure times involved mostly sitting, reclining, or standing, with no physical activity. This upwards trends in body mass index was strongly related with long sitting or reclining during leisure times (r = 0.5, p = 001) (see figure 2).

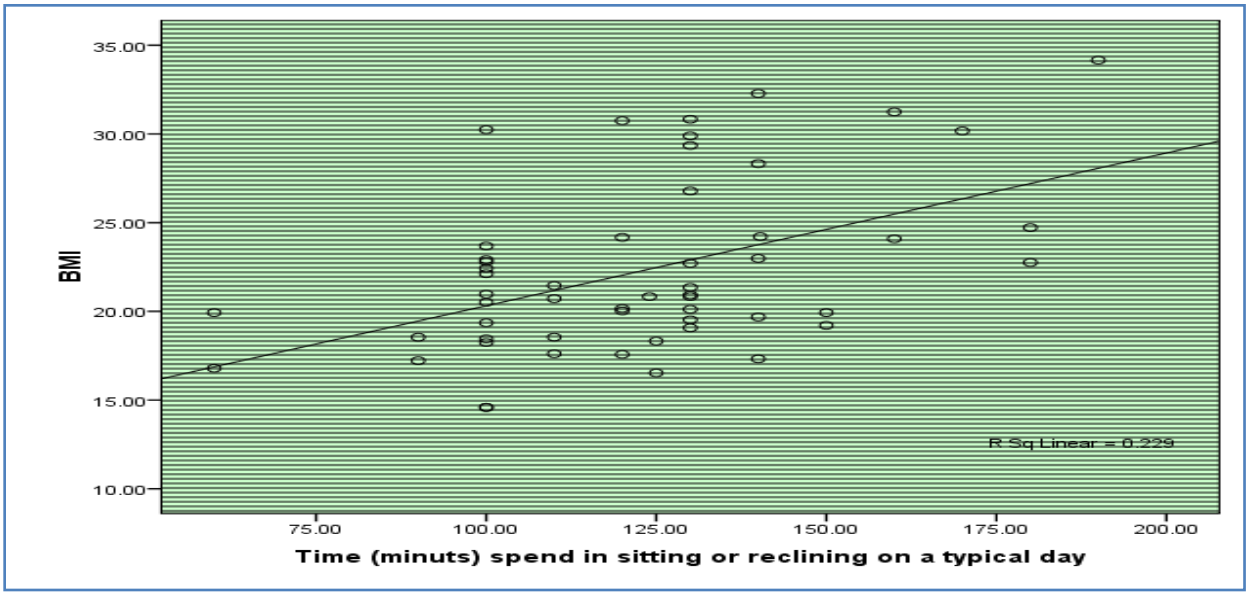

Figure 2: Correlation between BMI and time spent in setting or reclining in a typical day.

DISCUSSION

Among these 54 students, females are less likely to have normal weight while males are prone to develop obesity. The data show that occurrence of overweight and obesity was relatively low then general population of Pakistan (25%) (26). However the 20% underweight shows a unique occurrence.

The variation of BMI depends on varying factors. BMI varies with varying level and type of physical activities. Vigorous activities like heavy lifting, digging or construction work in a typical week was not associated with change in BMI which indicates that high level of physical activity are not necessarily achieved by doing heavy work irregularly in a typical week.

Similarly even moderate activities irregularly also had no impact on reduction of BMI, however once vigorous or moderate activities were carried on daily basis it likely maximized the relative body weight. The regular involvement in walking or using a bicycle (pedal cycle) was inversely related to the BMI. Duration of engagement in moderate activities and walking seemed negatively related with BMI. In the same way the longer was working day of the students the lesser was their BMI. This reflects that most of the participants with

normal BMI achieved it by walking or using bicycle for sufficient duration. Studies also reflect that being physically active does not need to be vigorous to provide health benefits but moderate intensity of physical activity on daily basis plays an important role in maintenance of normal relative body weight (27).

The reported sitting or reclining time ranged from 75 to 200 minutes. About 52% students reported that their reclining times ranged more than 120 min per day, where sitting or reclining times included the time spent at work, at home, in leisure, visiting friends, reading, or watching television, but did not include time spent sleeping and sitting at desk during class. The relationship among sitting or reclining time and BMI was seen positively correlated (r=0.49, p=0.01, figure 2). This indicates that body mass index is significant influenced by sedentary life style. These results agree with the findings that individual with longer average sitting times are less likely to have normal relative body weight (28). To investigate the sitting times with BMI, studies compared desk-bounded staff (clerks) with those whose work involves mostly walking, like teachers. The results of these surveys reported that students, clerks, administrative staff and sedentary working population are prone to gain body weight (28,29). Thus it is apparent that although sport facilities are available but still students are not taking active participation. With the ample opportunity for physical activity, students should opt selectively engagement in the exercise.

A major limitation of this study was the reliance on self-reported physical activity. Previous studies also suggested that participants tend to overestimate their height and physical activity (22,23).

Conclusion

Although overweight and obesity is not very high among the students of RMC (4% and 13%), respectively, however the correlating factors like long sitting or reclining time, low physical activity or lack of sport activities could aggravate the risk of obesity. On the other hand, vigorous activities or even moderate activities on irregular basis are not the influencing body mass; rather these must be practiced on daily basis for sufficient time. Spending sedentary life style could lead to increased BMI while regular involvement in walking, cycling and moderate activities can reduce the risk of being overweight or obese.

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