Innovare Academic Sciences

International Journal of Pharmacy and Pharmaceutical Sciences

ISSN- 0975-1491 Vol 7, Issue 10, 2015

Original Article

# PERCEPTION OF PARAMEDICAL STUDENTS IN A TEACHING INSTITUTE ON BMI, DIET AND SOCIAL HABITS–A CROSS SECTIONAL SURVEY

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*Received: 30 Jun 2015 Revised and Accepted: 08 Aug 2015*

**ABSTRACT**

**Objective**: The study focuses on young paramedical students' perception on Body Mass Index (BMI), diet, and social habits.

**Methods**: A total of 232 paramedical (pharmacy, physiotherapy, and nursing) students were enrolled in the study. Information about socio-demographic details was obtained by using a self-administered questionnaire. Body weight and height were taken and BMI was calculated. The questionnaire also assessed the students' eating habits, social habits, and exercise habits and also their perception towards their social habits like drinking alcohol and smoking cigarettes.

**Results**: The BMI of the female participants were on the upper limits of the normal Body Mass Index range levels. More female participants were found to be in the severely underweight or underweight, overweight, and obese category compared to their male counterparts. The study showed that most of the participants took either coffee or tea daily and a small percentage of students perceived smoking cigarettes and alcohol consumption to be good. Most students eat fewer amounts of fruits or vegetables than the prescribed daily intake and many do not exercise as required.

**Conclusion**: The out comes with paramedical student fraternity caution us to plan changes in practices in teaching facilities to bridge the gap in preaching and following what we preach in reality.

**Keywords**: Body mass index, Perception, Anthropometric, Obesity, Paramedical.

## INTRODUCTION

Obesity is often defined as a condition of abnormal and excessive fat deposition in the adipose tissue to the extent an individual's health is adversely affected [1]. Body mass index (BMI) is an anthropometric test that is most commonly used to assess the status of fat deposition in the adipose tissues and to determine the body fat [2]. Obesity represents a public health problem with increasing prevalence in both developed and developing countries and is estimated to be the fifth leading cause of death worldwide [3]. It is also a risk factor for many life threatening diseases like type 2 diabetes mellitus, hypertension, certain cancers, dys lipidemia, and coronary heart disease [4-8]. One of the major causes of obesity is the changes in the diet in terms of quality and quantity which has become more westernized [9]. Eating habits plays a major role in controlling or maintaining optimal weight. In 2010, a study report showed that most college student did not eat even one fruit a day and about half of the students took vegetables less than once daily[10]. This is because many people assume primary responsibility over their eating for the first time in their lifetime. Moreover, there are a lot of fast-food restaurants and other restaurants nest most of their campuses which also negatively impact on eating behavior of the students [11, 12].

In the past decade, sleep-related factors and, particularly, short sleep duration has also been proposed as a risk factor for obesity. Cross-sectional studies in the past have shown obese persons report short sleep duration than non-obese individuals [13]. Obese individuals report the much higher prevalence of sleep difficulties and emotional stress [14]. Psychological factors may also play a major role in the etiology of obesity [15]. A study has shown that lifetime diagnosis of anxiety and depression was associated with obesity in American adults [16]. Anxiety can lead to overweight which eventually leads to weight gain [17, 18].

A lot of studies have reported that obese people often involve in emotional eating, which is described as eating for reasons other than hunger and also consuming large quantities of food in response to emotional states [19-21]. Social habits like smoking and drinking alcohol may also worsen the complications of obesity. The co-occurrence of overweight and smoking has substantial consequences on health. According to Framingham study, the life expectancy of smokers who are obese was 13 y less than that of non-obese smokers [22]. Drinking alcohol is one of the popular behaviors that many college students adopt, which is adopted by almost 65% of the college students [23]. Since alcohol being the second most energy dense macronutrient (7 kcal./g), following closely behind fat (9 kcal/g), continued research is warranted in determining the role alcohol plays in the obesity within the 18-25 y age group[24, 25].

The objectives of this study were to 1) Determine the body mass index (BMI) of a sample of college students; 2) know the perception of college students towards BMI, smoking and drinking habits; 3) Assess the physical and psychological health of the students, and 4) Determine the eating pattern in college students as well as their parents. This study can be a starting point for a reassessment of the teaching and the practical training techniques in paramedical colleges where the students, the future paramedics, are to be convinced personally to bring in professional excellence that can change the way healthcare is operating today in India.

## MATERIALS AND METHODS

### Design and sample

This cross-sectional evaluation was conducted from January 2015 to May of 2015. This study was conducted at JKK Munirajah Medical Research Foundation's College of Health Sciences affiliated to The Tamil Nadu Dr. M. G. R. Medical University, Chennai. A total number of 232 students from the colleges of pharmacy, physiotherapy, and nursing were involved. Students aged above 18 were allowed to participate in the study after signing a written consent form according to Helsinki Declaration. All the participants were of Indian ethnicity and were chosen by the stratified random sampling method by department and class year. The response rate among students was 96.2%. The study was approved by Institutional Ethics Committee in JKK Munirajah Medical Research Foundation.

**Data collection**

Anthropometric measurements and self-reported questionnaire were used for data collection. The questionnaire was designed to study the eating, drinking, smoking habits; mental and physical health; socioeconomic background of the student as well as their parents. The questionnaire was standardized before its use [26-28]. Prior to filling of the questionnaire, the students were informed about the study and were given oral instructions on how to fill the questionnaire honestly and completely. Anthropometric measurements including height, weight, and BMI were conducted. The weight was measured using a calibrated electronic weighing machine. The height was measured to the nearest 0.5 cm using a portable meter rule. BMI was calculated with the values of height and weight using the formula BMI = weight/height$^2$. Based on WHO criteria, the cutoff point for being overweight was BMI≥25.0 kg/m$^2$ and for obesity was BMI≥30.0 kg/m$^2$.

**Data analysis**

Statistical analysis was done using Microsoft Excel. Descriptive statistics were used for anthropometric characteristics.

**RESULTS**

Table 1 presents general characteristics of 232 participants, which includes 103 (44.4%) male students and 129 (55.6%) female students. The age of the participants ranged from 18-31 y of age. The number of students fell in age group 18-22 was 114 (49.54%), in 23-27 was 115 (49.6), and students in age group 27-31 were 3 (0.2%). Majority of the participants fell in the age group of 18-27. Most of the students were from the state of Kerala 198 participants (85.4%) were as 32 students (13.8%) were from Tamil Nadu and 2 students (0.8%) hailed from other states. Majority of the participant's parents monthly income were in the range of Rs. 6000 to 10, 000 (27.6%) followed by>20,000 (24.6%), Rs.<5000 (13.4%), Rs. 11,000 to 15,000 (10.4%), Rs. 16,000 to 20,000 (78%), and 16.8% of the participants were not willing to disclose their parents' monthly income.

From the data obtained from the anthropometric measurements of the participants, the mean body weight of the male participants was 59.9 kg±15.6 and that of females was 48.1±9.1. The mean height of the study participants are as follows: Males 160.8±6.1 and female 148.8±4.6. The mean BMI of male participants was 20.7±4.2 and that of females was 23.7±5.3. This is shown in table 2.

It was also evident from the data obtained that majority of the participants 69.8% (162 participants; 88 females and 74 males) were in the normal BMI range followed by underweight 12.1% (28 participants; 20 females and 8 males), overweight 9.9% (23 participants; 21 females and 2 males), obese 4.7% (11 participants; 8 females and 3 males), and only 3.4% (8 participants; 6 females and 2 males) were severely underweight, which is shown in table 3.

The study explored the difference between the participants' actual weight and perceived weight. It was observed that almost all participants have a difference in perception on their body weight than what they actually weigh with a mean difference of 10.5%. This was depicted in table 4.

Table 5 shows the participants' response for eating, drinking and smoking habits. From the data obtained, it was evident that majority of participants 90.5% (210 participants) take three food servings a day followed by 6.9% (16 participants) take two meals a day, 1.73% (4 participants) take two four meals a day, 0.86% (two participants) take food only one time a day, and 0.86% (2 participants) were not willing to say anything. From the data in table 5, it was also evident that 97 participants (41.8%) take any one of the fruits at least one time a day and about 100 participants (43.1%) do not take any of the fruits even one time a day. It was also evident that 102 participants (43.97%) take at least one serving of vegetables per day and only 37 participants (15.95%) take three servings of vegetables per day. Regarding, the non-vegetarian diet, majority of the study participants (170 participants 73.28%) take non-vegetarian diet at least once a day.

**Table 1: Social demographic characteristics of the participants**

| Variables (%) | Frequency (N = 232) | Percentage (%) |
|---|---|---|
| **Age** | | |
| 18-22 | 114 | 49.54 |
| 23-27 | 115 | 49.6 |
| 27-31 | 03 | 0.2 |
| **Sex** | | |
| Male | 103 | 44.4 |
| Female | 129 | 55.6 |
| **State of origin** | | |
| Tamil Nadu | 032 | 13.8 |
| Kerala | 198 | 85.4 |
| Others | 02 | 0.8 |
| **Monthly Income of parents** | | |
| <5000 | 31 | 13.4 |
| 6000–10000 | 64 | 27.6 |
| 11000–15000 | 24 | 10.4 |
| 16000–20000 | 18 | 7.8 |
| Above 20000 | 57 | 24.6 |
| Unwilling to disclose | 39 | 16.8 |

N-sample size

**Table 2: Anthropometric measurements of the students by gender**

| Anthropometric characteristics | mean±SD | |
|---|---|---|
| | Male (N = 103) | Female (N = 129) |
| Body Weight (kg) | 59.9±15.6 | 48.1±9.1 |
| Height (m) | 160.8±6.1 | 148.8±4.6 |
| BMI (kg/m2) | 20.7±4.2 | 23.7±5.3 |

SD–Standard Deviation; Values are expressed±SD, N-sample size

Table 6 shows the perception of study participants towards social habits like drinking alcohol and smoking cigarettes. Majority of the participants (206 participants 89%) perceived smoking cigarette was bad and 195 participants (84%) perceived drinking alcohol was bad.

**Table 3: Actual body mass index showing prevalence of weight problems amongst the different sexes of students**

| BMI Values (kg/m2) | Males (N = 103) | Females (N = 129) | Total |
|---|---|---|---|
| Mean BMI | 20.7 | 23.7 | |
| Severely underweight BMI<16 | 02 | 06 | 08 |
| Underweight BMI 16.0-18.4 | 08 | 20 | 28 |
| Normal Weight BMI 18.5-24.9 | 88 | 74 | 162 |
| Overweight BMI 25.0–29.9 | 02 | 21 | 23 |
| Obese BMI>30.0 | 03 | 08 | 11 |

N-sample size

**Table 4: Difference between actual weight and perceived weight**

| BMI Categories | Actual % | Perceived % | Difference %±SD |
|---|---|---|---|
| Underweight | 5.5 | 15.5 | 10 |
| Overweight | 65.5 | 53 | 12.5 |
| Obese | 18 | 31 | 13 |
| Mean Total Difference | | | 10.5±2.3 |

SD–Standard Deviation; Values are expressed±SD; N–sample size

**Table 5: Participants response for eating, drinking, and smoking habits**

| Eating behavior | Frequency (N = 232) | Percentage (%) |
|---|---|---|
| **Food serving/Day** | | |
| One Time | 02 | 0.86 |
| Two Times | 16 | 6.9 |
| Three Times | 210 | 90.5 |
| Four Times | 04 | 1.73 |
| Cannot say | 02 | 0.86 |
| **Snacks/Day** | | |
| One Time | 140 | 60.4 |
| Two Times | 31 | 13.4 |
| Three Times | 05 | 2.2 |
| Four Times | 02 | 0.86 |
| **Fruit servings/Day** | | |
| One Fruit Serving | 97 | 41.8 |
| Two Fruit Servings | 23 | 9.9 |
| Three Fruit Servings | 08 | 3.5 |
| Four Fruit Servings | 04 | 1.73 |
| None | 100 | 43.1 |
| **Vegetable servings/Day** | | |
| Less than one serving | 12 | 5.17 |
| One serving | 102 | 43.97 |
| Two servings | 76 | 32.76 |
| Three servings | 37 | 15.95 |
| Greater than three servings | 05 | 2.16 |
| **Non-veg servings/Day** | | |
| None | 22 | 9.48 |
| One serving | 170 | 73.28 |
| Two servings | 32 | 13.79 |
| Three servings | 05 | 2.16 |
| Greater than three servings | 03 | 1.29 |

N-sample size

**Table 6: Perception on drinking and smoking**

| Social habits | Frequency (N = 232) | Percentage (%) |
|---|---|---|
| **Smoking** | | |
| Bad | 206 | 89 |
| Good | 07 | 3 |
| Good if limited | 18 | 7.8 |
| **Alcohol** | | |
| Bad | 195 | 84 |
| Good | 05 | 2 |
| Good if limited | 31 | 13.4 |

N-sample size

From the data obtained, it was evident that very few participants (less than 2%) smoke cigarettes and less than 3% of the study participants drink alcohol a week. This may be due to the participant's unwillingness to reveal their habit. This is shown in table 7. Table 7 also shows that most of the participants take either coffee or tea a day and only 41 participants (17.7%) do not take either of them.

**Table 7: Smoking, alcohol and other beverage consumption status**

| Habits | Frequency(N = 232) | Percentage (%) |
|---|---|---|
| **Smoking** | | |
| 1 cigarette per day | 02 | 0.86 |
| 2 cigarettes per day | 03 | 1.3 |
| 3 cigarettes per day | 02 | 0.86 |
| >3 cigarettes per day | 01 | 0.43 |
| **Alcohol** | | |
| 1 Glass per week | 06 | 2.6 |
| 2 Glass per week | 02 | 0.86 |
| 3 Glass per week | 02 | 0.86 |
| **Coffee/Tea** | | |
| Both | 39 | 16.8 |
| Coffee alone | 37 | 15.9 |
| Tea alone | 115 | 49.6 |
| None | 41 | 17.7 |
| **No. of coffee/Tea per day** | | |
| 1 coffee or tea/day | 65 | 28.1 |
| 2 coffee or tea/day | 99 | 42.7 |
| 3 coffee or tea/day | 13 | 5.6 |
| >3 coffee or tea/day | 9 | 3.9 |

N-sample size

Table 8 gives the information about physical and mental health status of students. About 25.5% (59 participants) fell ill at least one time in the past there months followed by 28 participants (12.1%) fell ill two times, 16 participants (6.9%) fell ill three times, 10 participants (4.3%) fell ill greater than four times, and 5 participants (2.2%) fell ill four times in the last three months. The study also showed that 187 participants (80.6%) felt active most of the time in their life compared to 22 participants (9.1%) felt not active at all mostly.

**Table 8: Physical health and mental health status of students**

| Health status | Frequency (N = 232) | Percentage (%) |
|---|---|---|
| **Physical illness in past three months** | | |
| One time | 59 | 25.5 |
| Two times | 28 | 12.1 |
| Three times | 16 | 6.9 |
| Four times | 05 | 2.2 |
| >four times | 10 | 4.3 |
| **General feeling** | | |
| Extremely energetic | 07 | 3.1 |
| Active | 187 | 80.6 |
| Not active | 21 | 9.1 |
| Not sick | 16 | 6.9 |
| Not known | 01 | 0.43 |
| **Minutes of exercise/Day** | | |
| No Exercise | 148 | 63.8 |
| <15 Min | 14 | 6.1 |
| 15-30 Min | 29 | 12.5 |
| 30-45 Min | 02 | 0.86 |
| 45-60 Min | 17 | 7.33 |
| >60 Min | 04 | 1.7 |

N-sample size

Regarding the time each participant spends each day for exercise, about 148 participants (63.8%) do no exercise a day and only 29 participants (12.5%) gets the prescribed 15-30 min of exercise a day. This is also depicted in table 8.

## DISCUSSION

Though the mean BMIs fell inside the normal range, the BMI of the female participants are on the upper limits of the normal BMI range levels. More female participants were found to be in the severely underweight or underweight, overweight, and obese category compared to their male counterparts. More men fell under the normal BMI range. All participants have a difference in perception on their body weight than what they actually weigh with a mean difference of 10.5%. The judgment about one's own weight was always low whereas the reality was contradictory to this belief. Up to 43.1% of the participants took no fruit servings in a day and up to 5% of participants do not take or take less than one serving of vegetable a day on average in spite of being paramedical professionals who are supposed to be aware of the health benefits of vegetables and fruits in everyday diet. 73% of participants took at

least one serving of non-veg diet a day and up to 14% people take two servings of non-veg diet a day, which may probably be the etiology for the high BMIs of female participants, as they are the maximum lot in this survey.

While 8% perceive smoking was good if limited, 3% perceive it was good. While 2% believe alcohol was good for health, 14.3% believe its good when limited. Such perception may harm the involvement of these professionals in de-addiction activities in future. Enough and ample number of studies has proved the harmfulness of smoking and alcohol consumption. Even 30-60 ml of alcohol may also harm the Asian ethnic groups were what various studies have documented.

60% consume at least one snack a day and 13% consume at least two snacks a day, which may be the cause of the BMI on one hand and to the non-consumption of prescribed fruit and vegetable servings on the other hand.

Up to 13% of people fell ill at least once a month and 16% in general felt that they do not feel active or at least they have a feeling that "I am ok–that I am not sick" at least. Lack of exercise, lack of balanced diet, unhealthy snacks, stress and other living conditions can be attributed to such outcomes of not feeling well or active. Up to 64% of people who participated in the study do no exercise, which was another important aspect that this study had revealed–Every counseling by the paramedical staff whether it was a pharmacist or a physiotherapist or a nurse, everyone harps on exercise as a preventive measure for various diseases and co-morbidities–but the reality was it was not practiced by the very person who advocates the same. This may lead to lower levels of conviction in advocating exercise in the counseling rooms too in future.

**Limitations of the study**

The study aims only at understanding the perceptions but not the cause. The specific cause effect relationship cannot be understood even for the variables studied and future studies narrowing down on any one of the plethora of subjects studied can be more beneficial than just observatory studies.

**CONCLUSION**

In conclusion, the female participants were vulnerable to either extremes of the BMI. The perceived weight was always lesser than the actual weight in the study population. Consumption of fruits was very low and was the same case with vegetables and the consumption of tea and snacks was high on the contrary. The belief about smoking and alcohol consumption needs a check, as the direction was seemingly alarming for a paramedical teaching facility. In general, the unhealthy feeling may be attributed to these beliefs and food habits along with the alarming sedentary lifestyle with 64% not exercising even for a minimum of 5-15 min per day. For a paramedical fraternity, these are findings that caution us to take right directions in involving students to practice what we preach to people being health professionals.

Contrary to the famous belief, Practice makes the man perfect, its time for us to understand that the right practice makes the man perfect otherwise it is not going to be true.

**CONFLICT OF INTERESTS**

All authors have none to declare

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