A Study On Current Trends in Malnutrition and Physical Activity Status Among Female Students of Technical Education

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Abstract: **The present study was conducted to understand and identify the trends in the prevalence of malnutrition, physical activity status of the female students of technical Education. This experimental study with cross sectional design recruited one hundred and seventy female B. Tech. students aged between 18-20 years from a reputed women's Engineering college in Hyderabad by adopting random sampling technique. Anthropometric measurements such as height, weight was measured using standard procedures. The body mass index (BMI) was derived using weight and height of the subjects based on which the subjects were divided into underweight, normal weight and overweight/ obese subjects as per WHO norms. The body composition was assessed by using bioelectrical impedance principle. The physical activity status was assessed by the time allocation pattern method. The results of this study had shown that out of 170 students, 19.4% were found to be underweight, 59.4% normal weight and 21.2% were in overweight/ obese category based on their BMI status. The physical activity status data had shown, 66.5% of the students were physically inactive and only 33.5% were physically active. It can be concluded from this study that current trends in prevalence of higher levels of malnutrition (both under and over nutrition) and physical inactivity which needs to be attended through required measures. It is recommended that credit based mandatory Physical Education programmes in technical Educational Institutions to motivate the female students to participate in regular physical activities. Awareness programmes on importance of proper diet and regular physical activity for health and fitness, optimum work capacity, prevention of malnutrition and related health risks must be organised as a top priority for the students of technical education.**

Keywords: **Malnutrition, physical activity, female students.**

1. Introduction

Sound nutrition lays foundation for proper physique and optimum work performance. In spite of tremendous growth in the field of health and medicine, dual burden of malnutrition (both under and over nutrition) is a major health concern in developing countries like India. The NFHS report (2015-16) shows that 23% of Indian women are underweight and 21% are overweight/obese. Indian women stand 3rd in global obesity rankings with 20 million obese women in India as per WHO (2010) report. It was well established that both under and over nutrition can cause several fatal diseases and other health risks that leads to impaired work performance. (Mastorci et al., 2017). The ICMR report (2014) on physical activity status of Indian women, 90 of the adolescent population in India had insufficient physical activity. The present study was taken up to understand the trends in malnutrition and physical activity status of young female students of technical education. The health and fines of young women is key to the economic and social growth and development of our nation as 50% of the Indian population are women.

2. Methodology

This study was a cross sectional study with one hundred and seventy female students aged between 18-20 years of age pursuing under graduation programs in different branches of Engineering were recruited from a reputed women's Engineering college in Hyderabad by adopting random sampling technique. Anthropometric measures such as height and weight were recorded by using standard procedures. The body mass index (BMI) was derived using the height and weight values of the subjects. Based on the BMI values of the subjects their nutritional status was identified and were categorised into underweight, normal weight and overweight/obese groups. The body composition was assessed by body composition analyser (Karada scan, HBF-362, Omran). The physical activity status was assessed by activity recall method. (Ravi Kumar et al 2021) The amount of time spent, type of activity, frequency, intensity of activity for various physical activities/ sports/ recreational activities were recorded. The physical activity status was identified based on American college of sports medicine (ACSM) guidelines for physical activity norms.

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Table 1
Mean ± SD Values of Anthropometry measurement

	N	Age (years)	Height (meters)	Weight (Kg)	BMI (Kg/m^2)	BSA (m^2)
Mean±SD	170	18.60±1.077	1.5±0.05	54.70± 9.31	21.60± 3.57	1.55± 0.14

BM= Body Mass Index, BSA=Body Surface Area, SD=Standard Deviation, N=Number of subjects

Table 2
Mean ± SD values of Body composition

Variable	N	Fat (Kg)	LBM (Kg)	Fat (%)	LBM %	VF (Kg)
Mean±SD	170	16.8± 4.81	37.9± 5.25	30.26± 4.38	20.90± 1.78	2.67± 2.34

LBM=Lean Body Mass, VF=Visceral Fat

3. Results

Table 1 depicts that the total number of subjects selected by adopting systematic random sampling technique was 170 for which the mean age was 18.60 ± 1.077 years. The mean height of the participants was 1.5 ± 0.05 metres. The mean weight of the young women was 54.70 ± 9.31 Kg. The mean Body Mass Index (BMI) of the subjects was 21.60 ± 3.57 Kg/m^2 that indicates they were in normal weight range. The mean Body Surface Area (BSA) of the subjects was 1.55 ± 0.14 m^2.

Table 2 provides the data on the Body Composition parameters of the 170 subjects. The mean Fat Mass for the 170n subjects was found to be 16.8 ±4.81 Kg. The mean Lean Body Mass of the subjects was 37.9 ± 5.25 Kg. The mean Fat percentage of the subjects was 30.26 ± 4.38 % and the mean Lean Body Mass percentage was found to be 20.90 ± 1.78 %. The mean Visceral Fat content of the subjects was 2.67 ± 2.34 Kg.

Out of 170 students, 19.4% were found to be underweight, 59.4% normal weight and 21.2% were in overweight/ obese category based on their BMI status. When looked into physical activity status, 66.5% of the students were physically inactive and only 33.5% were physically active based on American college of sports medicine (ACSM) Physical activity guidelines. (Table 3, 4 and Fig. 1and 2)

Table 3
Nutritional status of the participants based on their BMI

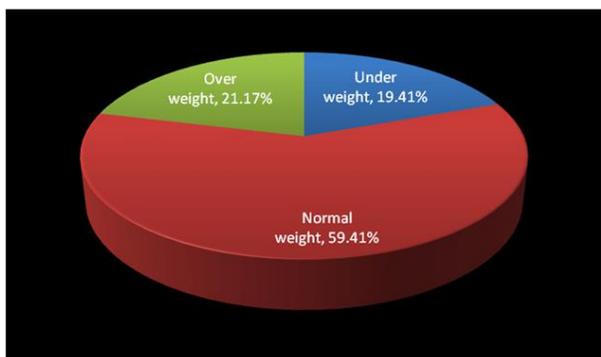| Group	Number of subjects (N)
Under weight	33
Normal weight	101
Over weight	36
Total	170

Fig. 1. Nutritional status of the participants based on their BMI as a percentage

Table 4
Classification of participants based on Physical Activity status

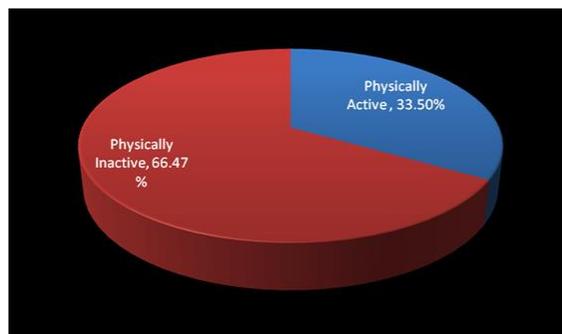| Physical activity status group	N
Physically Active	57
Physically Inactive	113
Total	170

Fig. 2. Physical Activity status of the participants as a percentage

Table 5 shows the percentage of students with below and above 30% fat. This clearly indicated that more than 50% of the female students were having more than 30% body fat which is very high when compared to the desirable body fat percentage of healthy, fit females of young women.

Table 5
Classification of participants on the basis of body fat percentage

Body fat percentage status groups.	N	%
Below 30% body fat	73	42.9
Above 30% body fat	97	57.1
Total	170	

Table 6 depicts the trends of distribution of three nutritional groups by physical activity status. Out of 113 physically inactive female students,22% were overweight, around 64% were from normal weight and remaining 14% from underweight group. Similarly, out of 57 physically active female students, around 19% were overweight mostly players from Throw ball group, Table tennis group and Throwers group (athletics) etc. and 28% underweight female group had endurance athletes and kho kho players.

Table 6
Distribution of Underweight, normal weight and overweight participants in physically active and physically inactive groups

BMI status	Physically active	Physically inactive
UNDER WEIGHT	16.. (28.1%)	16 (14.2%)
NORMAL WEIGHT	30 (52.6%)	72 (63.7%)
OVER WEIGHT	11 (19.3%)	25 (22.1%)
TOTAL	57	113

Table 7
Pearson Correlation coefficients (n=170)

		H	W	BMI	BSA	Body FAT %	FAT (KG)	VF
H	Pearson Correlation	1	.281[**]	-0.137	.463[**]	-0.135	0.096	-0.108
W	Pearson Correlation	.281[**]	1	.908[**]	.974[**]	.606[**]	.921[**]	.637[**]
BMI	Pearson Correlation	-0.137	.908[**]	1	.805[**]	.676[**]	.904[**]	.714[**]
BSA	Pearson Correlation	.463[**]	.974[**]	.805[**]	1	.525[**]	.859[**]	.560[**]

H= Height, W+ weight, BMI+ body mass index, BSA+ Body surface area, VF+ Visceral Fat

Table 7 shows the correlations between anthropometric parameters with body fat and visceral fat percentage among the female students. The body weight, body mass index and body surface area (BSA) were significantly correlated with body fat (both % and KG mass) and Visceral fat.

4. Discussion

The present study was conducted to understand the current trends in the prevalence of malnutrition (both underweight and overweight/obese) and physical activity status among female students of Technical Education from Hyderabad, Telangana state. This study had shown that ot of 170 students, 19.4% were found to be underweight, 59.4% normal weight and 21.2% were in overweight/ obese category based on their BMI status. This study is in line with the studies conducted by K S Premla et al (2016), Thakkar HK (2010), Hong SA (2018), Ashok C K et al (2018) on female college students in different parts of India and outside India.

The present study data on physical activity status of female students of technical education indicates that 66.5% students were physically inactive when compared with ACSM physical activity guidelines and only 33.5% students were involved in regular physical activity/ sports/ fitness/ recreational activities. This data is in line with the results of the study conducted by Hana A (2019)

According to the study conducted by Indian council of Medical Research on physical activity levels of Indians, had shown that, 54.4% were physically inactive), while 31.9% were active and 13.7% were highly active. The report of on global physical activity levels, by the World Health organisation (WHO) 2010, had shown 58.5% of adults, 71% of youth, and 57% of children are considered physically inactive. The WHO also observed that the increased levels of physical inactivity as the 4th major risk factor for 6% of deaths every year globally die to non-communicable diseases.

5. Conclusions and Recommendations

It can be concluded from this study that the current trends in malnutrition, both underweight and overweight/obese student percentage was 39% of the total studied population which is very high and needs to be attended through required measures and intervention programmes. More than half (63. %) of the studied female subjects were physically inactive. The poor lifestyle pattern with imbalances in energy intake and expenditure along with insufficient regular physical activity might have manifested the variations in nutritional status, body composition physical activity status among these female students.

It is recommended that awareness programmes on importance of proper diet and regular physical activity for optimum work performance, health and fitness, prevention of malnutrition and related health risks is need of the hour. The young female students are future technocrats and going to play a key role in the economic and social growth and development of our nation.

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