



## RESEARCH ARTICLE

## Evaluation of physical fitness parameters among future doctors of Belgaum – A cross sectional study

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## ARTICLE INFO ABSTRACT

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**Background:** Physical inactivity is the fourth leading risk factor for global mortality. Medical education with its vast curriculum and rigorous training is often very stressful and leads to physical inactivity and poor nutrition as a negative consequence. Medical students as future health care providers are responsible for the good health of our citizens and therefore our study is aimed to study the interrelation between physical inactivity and health of medical student.

**Methods:** This cross-sectional study was conducted among 80 undergraduate MBBS students. Quota sampling method was used to identify 40 students from first year and 20 each from second and third year. A pretested, semi structured questionnaire including information about age, sex, attitude and practice of physical activity was collected. Anthropometric parameters and Physical performance parameters were assessed. Data entry was done using Excel sheet and statistical analysis was done in SPSS 23.0

**Results:** Mean BMI of subjects in the sample is  $23.72 \pm 5.31$  (kg/m<sup>2</sup>). Majority of subjects in the sample are with normal BMI followed by obese whereas 9 (11.25%) of subjects are underweight Mean of SBP and DBP in the sample is  $115.33 \pm 16.03$  and  $76.35 \pm 10.23$  (mmHg) respectively. Out of 80 subjects, most of them 76 (95%) had poor physical fitness score whereas one subject each had good and excellent Physical fitness test score .48 (60%) of 80 subjects in the sample had intermediate agility score .53 of 80 subjects had Central obesity and 25 had truncal obesity i. e; 25 (47.17%) of 50 central obesity subjects had truncal obesity

**Conclusion:** This study reiterates the importance of physical activity as way of primary prevention to achieve healthy life and encourages implantation of comprehensive health programs in medical curriculum.

### Introduction

Physical activity and activity of youth, in the last decade are on steady decline and the most rapid declines appear to occur during late adolescence and early adulthood (1-2). Physical inactivity and associated health problems pose a current and growing threat to

public health (3). The behaviors of students are considered a temporary part of college life, however, unhealthy habits picked up at this level generally persists forever. Medical college life is also a period during which individuals are exposed to stress and lack of time posing a barrier to adoption of unhealthy

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practices (4). The medical students have a greater knowledge about healthy lifestyle and dietary habits when compared to any other college students. However, there is no evidence to indicate that this knowledge translates into practice in terms of maintaining good health. Non-communicable diseases (NCD) will account for 73% of deaths and 60% of the global disease burden by 2020. Physical activity plays a major role in the prevention of these non-communicable diseases. The stress involved in meeting the responsibilities of becoming a physician may adversely affect the exercise habits of students (5-6). Medical students have certain privileges and responsibilities different from other students, they must be aware of acting in position of qualified doctor and their fitness will impact on their fitness to practice medicine (7). Attitude of medical students towards regular physical exercise is fundamental in developing prevention oriented behavior of future physician (8).

With many studies reporting lack of physical inactivity in college students it becomes imperative to evaluate the physical fitness especially in medical students whose health often determines societal health. Very little literature is available on the physical fitness of medical students in this part of Karnataka, hence there is a need for such a study.

Therefore, this study was planned to evaluate the Physical Fitness Parameters among Medical Students of age group 18-25 years. The Physical Fitness was evaluated by anthropometric parameters and physical performance measures including, Physical Fitness Index Test, Flexibility Test, Agility Test and Reaction Time.

## Materials and Methods

A cross-sectional study was conducted among the undergraduate medical students of Jawaharlal Nehru Medical College, KLE Academy of Higher Education, Belagavi. The Ethical clearance was obtained from the Institutional Ethical Clearance Committee prior to initiation of the study. The study sample included 80 medical students. 40 students from first year and 20 each from second and third year. Medical Students who had Respiratory Problems like asthma or any Physical Disabilities were excluded.

Students not consenting to participate in the study were excluded.

A pre-tested, semi-structured questionnaire including information about age, sex, attitude and practice of physical activity was collected. Anthropometric parameters of the study population were measured by the researchers. Body Mass Index was calculated by using Quélet Index and Pearson correlation coefficient was used to assess its relation with Blood pressure, agility, flexibility, audiovisual reaction time and SpO<sub>2</sub>. Physical Fitness Index was calculated and interpreted by using Harvard Step Test. A value greater than 97 was considered excellent, 83-96 was considered good, 68-82 as average, 54-67 as low average and less than 54 as poor. The Wilcoxon signed-rank test was used to assess SpO<sub>2</sub> changes with exercise. Data entry was done using Excel sheet. Data was cleaned and scrutinized for missing values and consistency with the forms. All the hard copies are stored.

Statistical Analysis was done in SPSS 23.0. Distributions of variables and their goodness of fit was studied and tested. Chi-square test and non-parametric test were used. Multiple Regression Analysis and Logistic Regression Analysis as required were used to study the impact of individual variables and their interactions.

## Results

Table 1: Study variables among Medical Students

Variables		Results (Mean ± SD or %)
Age(years)		34.57 ± 14.61
Gender	Male	40 (50%)
	Female	40 (50%)
BMI (kg/m <sup>2</sup> )		23.72 ± 5.31
BMI category	Underweight	9 (11.25%)
	Normal	43 (53.75%)
	Obese	28 (35%)
Waist Hip Ratio		0.88 ± 0.11

Table 1 (Continued)

Variables		Results (Mean ± SD or %)
WHR category	Normal	21 (26.25%)
	Central Obese	59 (73.75%)
SBP(mm Hg)		115.33 ± 16.03
DBP(mm Hg)		76.35 ± 10.23
Test time(sec)		74.5 ± 99.2
Heartbeat between 1 to 1.5 mins (bpm)		136.18 ± 23
PFI score		27.61 ± 36.12
Flexibility		0.99 ± 6.18
Agility Score		24.36 ± 5.86
ART		0.3 ± 0.13
VRT		0.29 ± 0.12
SPO2(Before Exercise)		96.56 ± 11.81
SPO2(After Exercise)		96.4 ± 11.36

A total of 80 undergraduate medical students were studied in the age group of 18-25 years. 50% of sample population is male and rest is female. It has been observed that distribution of subjects in the sample is equal. Mean BMI of subjects in the sample is  $23.72 \pm 5.31$  (kg/m<sup>2</sup>) also, it has been observed that the majority of subjects in the sample are with normal BMI followed by obese whereas 9 (11.25%) of subjects in the sample are underweight BMI. The mean of SBP and DBP in the sample is  $115.33 \pm 16.03$  and  $76.35 \pm 10.23$  (mm Hg) respectively. Mean of test time in the sample is 74.5 sec and the mean heartbeat (between 1-1.5mins) is 136.18 beats. Mean of PFI score, Flexibility and Agility score in the sample are 27.61, 0.99 and 24.36 respectively. Using Wilcoxon sign rank test, it has been concluded there is no significant gain/reduction in SPO<sub>2</sub> from baseline to after exercise ( $p=0.3856$ ). (Table 1)

Table 2: Correlations of BMI with different study variables

Factors	R	p-value
SBP	0.2170	0.0266
DBP	0.3113	0.0049
Test time(sec)	-0.0841	0.4581
Heartbeat between 1 to 1.5 mins (bpm)	-0.0759	0.5032
PFI score	-0.0839	0.4591
Flexibility	-0.0784	0.4893
Agility Score	-0.2898	0.0091
ART	-0.0337	0.7668
VRT	0.1498	0.1848
SPO2(Before Exercise)	0.0205	0.8569

Correlation of BMI with different factors was assessed. Using Pearson correlation coefficient, it has been concluded that there is a significant positive correlation of BMI with SBP as well as DBP and there is a significant negative correlation of BMI with Agility score whereas there is no significant correlation of BMI with other factors. (Table 2 and Fig 1)

Figure 1: Correlation of BMI with Blood Pressure in mmHg and Agility Scores

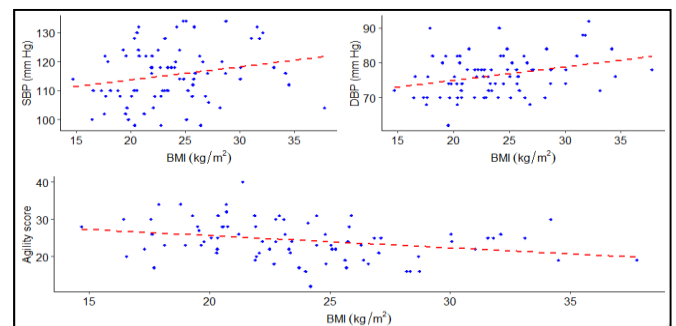


Table 3: Awareness about Physical Activity among Medical Students.

Questions	Sub-category	N (%)
Do you feel the need for regular physical activity?	Yes	76 (95)
	No	4 (5)
Are you physically active?	Yes	58 (72.5)
	No	22 (27.5)
Have you been physically active before joining medical school?	Yes	53 (66.25)
	No	27 (33.75)
Do participate in the sports events of your college?	Yes	45 (56.25)
	No	35 (43.75)

Table 3 (Continued)

Questions	Sub-category	N (%)
Do you have an opportunity to use sports facilities at the university?	Yes	67 (83.75)
	No	13 (16.25)
Is physical activity an important part of daily life for you?	Yes	62 (77.5)
	No	18 (22.5)

Although 95 % feel the need of physical activity, still only 72.5% are actually engaged in some form of physical activity and only 56.25% participate in sports events of the college. (Table 3)

Table 4: Fitness Profile of Medical Students

Variables	Classification	Scores Obtained
PFI	Poor	76 (95%)
	Low average	2 (2.5%)
	Good	1 (1.25%)
	Excellent	1 (1.25%)
Flexibility score	Negative*	29 (36.25%)
	Well below average	50 (62.5%)
	below average	1 (1.25%)
Agility	Adv. Beginner	1 (1.25%)
	Intermediate	48 (60%)
	Adv. Intermediate	15 (18.75%)
	Advanced	16 (20%)
Truncal obesity	Not	55 (68.75%)
	Obese	25 (31.25%)
Central obesity	Not	27 (33.75%)
	Obese	53 (66.25%)

\*measure that does not reach the toes is **negative**.

It has been observed that out of 80 subjects, most of them 76 (95%) had poor physical fitness score whereas one subject each had good and excellent Physical fitness test score. 48 (60%) of 80 subjects in the sample had intermediate agility score and 16 (20%) had advanced agility score. Total of 53 of 80 subjects had Central obesity and 25 had truncal obesity i. e; 25 (47.17%) of 50 central obesity subjects had truncal obesity. (Table 4).

## Discussion

The objective of our study was to evaluate physical fitness parameters by anthropometry and

physical performance measures like cardiovascular endurance, flexibility and quickness in medical students of Phase I, II and III in Jawaharlal Nehru Medical College in Belgaum. About 53% of subjects had normal BMI, 11.25% were found underweight and 35% were found obese and 73.75% having central obesity which is significantly higher than reported previously (37.3%) (9). Majority of the subjects felt the need of regular activity.

The prevalence of physical inactivity was higher (27.5%) as compared to that (15.4%) found in the students of Bangalore (10). Agility score in our study population has been found to be slightly higher than as reported in earlier studies (11) while Physical fitness index calculated by Harvard step test was found to be similar as in medical students in MNR Medical college students, Telangana. (12)

The main study limitations include its cross-sectional nature. The number of students participating in the study is relatively small and limited to a medical student in one part of Karnataka. The study cannot be generalized as the sample is from medical students and may not represent young adults in the general population.

## Conclusion

Regular physical exercise is an essential part of healthy lifestyle, therefore all medical professionals should maintain the good level of physical activity to remain healthy and look credible in the eyes of their patients. There is an urgent need for spreading awareness among students of medical college about their physical fitness status, so that as physicians of tomorrow, they are able to advise their patients regarding healthy lifestyle practices. Physical activity must be made compulsory in medical schools to utilize it as a primary prevention tool in improving overall health and reducing disease burden.

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