PHYSICAL FITNESS LEVELS IN MEDICAL STUDENTS AND ITS CORRELATION WITH ACADEMIC PERFORMANCE

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Abstract

Background: Long study hours and being cooped up cramming long prose of medical literature basically means that medical students in Pakistan have to sacrifice time which could have been spent on physical activity which equates to poor physical activity.

Objective: The objective of this research is to assess the physical fitness level in medical students and the correlation between physical fitness and the academic performance of students.

Methodology:

Two hundred and fifty medical students were included in the study. Aquestionnaire was given to the participant after briefing them regarding the research topic, objectives and what was required of them. All the data collected was entered in SPSS ver:17. The qualitative variables were presented as frequency and percentage and the quantitative variables were presented as mean and standard deviation. The independent variable was cross tabulated with the dependent variable (x) and any association was found using chi square test of significance. A p value of <or=0.05 was taken as statistically significant.

Results: The study showed that the majority of individuals were of average physical fitness amounting to 172(68.8%). 49(19.6%) individuals had good physical fitness. Of the individuals with poor physical activity 3(10.34%) had poor academic performance.19(11.04%)individuals with average cumulative physical activity had poor academic performance.

Conclusions: The physical fitness of most of the medical students in the study was of an average level. We found that those individuals having average physical fitness were academically superior to those who fell on the extremes of the physical fitness spectrum.

Key words: academic performance, cognition, exercise, medical students

According to the CDC, physical fitness is defined as 'the ability to carry out daily tasks with vigor and alertness, without undue fatigue, and with ample energy to enjoy leisure-time pursuits and respond to emergencies.' The components of fitness that we considered were as follows; cardiopulmonary endurance, muscular endurance, muscular strength, speed, number of sports and number of exercises participated in.

This is a globally pressing issue with physical fitness levels deteriorating and being in an appalling state around the world. Affluent and developed nations are not immune, only 62 % of Scottish people, 66% of English men and 56% of English women claim to meet CMO recommendations.[1] Low physical fitness leads to a myriad of problems inflic-

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ting both the individual and the nation as a whole. In developed countries, it has led to an array of illnesses and causes 22-23% of CHD,16-17% of the colon cancer, 15% of diabetes,12-13% of strokes and 11% of breast cancer. It has a great toll on the country's economy as well and costs the NHS 94 million pounds annually.[2] Pakistani individuals are even less likely to reach physical activity recommendations as compared to individuals in England. Only 21% of people in America are meeting the guidelines laid done by CDC in their 2008 physical activity guidelines. Lack of physical activity is associated with many adverse effects. Although, widely regarded as separate entities, physical fitness and levels of anxiety and depression are directly related. The physical deterioration manifests as: CVS diseases, Coronary heart disease, overweight or obesity, decrease in skeletal muscle mass, increased blood pressure and increase cholesterol. Such adverse effects prove a hindrance, and as such medical students may suffer from inadequacy both in their scholarly pursuits and other facets of life.

Long study hours and being cooped up cramming long prose of medical literature basically means that medical students in Pakistan have to sacrifice time which could have been spent on physical activity which equates to poor physical activity. No such research was present that focused primarily on this demographic and this section had been largely overlooked, as such we saw it pressing that we put together this article which provides insight to this pressing problem. The objective of this research is to assess the physical fitness level in medical students andthe correlation between physical fitness and the acade-mic performance of students.

METHODOLOGY

ACross Sectional study was conducted at Allama Iqbal Medical College, Lahore during April-May 2017. 250 medical students from Allama Iqbal Medical College, Lahore of 1st year to 5th year were included in the study. A questionnaire was given to the participants after briefing them regarding the research topic, objectives and what was required of them. All the data collected was entered in SPSS ver:17. The qualitative variables were presented as frequency and percentage and the quantitative variables were presented as mean and standard deviation. The independent variable was cross tabulated with the dependent variable (x) and any association was found using chi square test of significance. A p value of <or=0.05 was taken as statistically significant.

RESULTS

From the questions asked each option was assigned a score, with the least physically tasking assigned the lowest score (1) and the most physically tasking, the highest score (4). Accordingly the respondents on the basis of their cumulative score were classified into 3 groups which were as follows: poor (0-6), average (6-13) and good (14-24).

From the questions asked regarding academic performance, the least academic were assigned the lowest score[1] and the best academic scores assigned the highest.[5] Accordingly, the respondents on the basis of their cumulative score were classified into 3 groups which were as follows: poor (0-4), average (5-7) and good(8-10). 29(11.6%) individuals had poor physical fitness, 172(68.8%) had average physical fitness and 49(19.6%) individuals had good physical fitness. The individuals with poor cumulative physical activity had 3(10.34%) that had poor academic performance; there were 21(72.41%) with average academic performance and 5(17.24%) had good academic performance. The individuals with average cumulative physical activity had 19(11.04 %) that had poor academic performance; there were 107(62.20%)that had average academic performance and 46(26.74%) had good academic performance. The individuals with good cumulative physical activity had 7(14.29%) that had poor academic performance; there were 37(75.51%) with average academic performance and 5(10.20%) had good academic performance.

Of the 250 individuals, 80 (32%) reported that they did not partake in any form of exercise in a

typical week, 97 (38.8%) reported that they exer-cised 1-3 times a week, 41 (16.4%) reported that they exercised 3-5 times a week, and 32 (12.8%) reported that they exercised more than 5 times a week. When questioned about their cardio-respiratory endurance by virtue of their ability to jog without getting exhausted, 74 (29.6%) reported that they can do so for 1-5 minutes, 74 (29.6%) reported that they can jog for 6-10 minutes without exhaustion, 45(18%) stated that they can jog without exhaustion for 11-15 minutes, and 57 students (22.8%) stated that they perform the stated task for greater than 15 minutes. When assessing muscular endurance we asked the participants how many push-ups they could perform with ease, 124 students (49.6%) stated that they can perform 1-5 pushups with ease, 49 students (19.6%) stated that they can perform 6-10 pushups, 37 students (14.8%) stated that they can perform 11-15 pushups whilst 40 students (16%) stated that they can perform more than 15 pushups with ease. While assessing the muscle strength of the candidates, we asked them about the amount of weight they could lift, the results were as follows: 110 students (44%) could lift 5kg-10kg; 70 students (28%) could lift 11kg-30kg; 44 students (17.6%) could lift 31kg-50kg; 26 students (10.4%) could lift greater than 50kg. On the question of speed evaluation, 29 students (11.6%) stated that they run at a slow pace, 122(48.8%) at a medium pace, 78 (31.2%) at a fast pace, and 21(8.4%) could run at a very fast pace. Of the given options, when asked to identify the sports they partook in,84 individuals (33.6%) said that they had participated in one of the sports mentioned in the options, 36 individuals (14.4%) participated in 2, 24 individuals (9.6%) participated in 3, 13 individuals (5.2%) participated in 4, 6 individuals (2.4) partici-pated in 5, and 1 individual (0.4%) participated in 6, 1 individual (0.4%) reported to have participated in 8 of the mentioned sports, and 4 individuals (1.6%) had participated in all 9 mentioned sports, the remai-ning 81 individuals (32.4%) however, did not parti-cipate at all. When asked regarding their present physical fitness compared to that before medical college we

Table 1: *Socio-Demographic Profile of Medical Students*

Variables	Frequency	Percent %
Frequency of Exercise in a week		
Never	80	32.0
1-3	97	38.8
3-5	41	16.4
>5	32	12.8
Cardiorespiratory endurance		
1-5 min	74	29.6
6-10 min	74	29.6
11-15 min	45	18.0
> 15 min	57	22.8
Muscular endurance		
1-5 pushups	124	49.6
6-10 pushups	49	19.6
11-15 pushups	37	14.8
15< pushups	40	16.0
Muscle Strength		
5-10 kg	110	44.0
11-30 kg	70	28.0
31-50 kg	44	17.6
>50 kg	26	10.4
Speed		
slow pace	29	11.6
medium pace	122	48.8
fast pace	78	31.2
Very fast pace	21	8.4
Participation in sports		
Yes	169	67.6
No	81	32.4
Perceived Physical Fitness		
more fit	122	48.8
less fit	128	51.2
Determine what this change in physical fitness did to their study capabilities		
Diminished	64	25.6
Improved	68	27.2
No change	118	47.2
Percentage in last 5 tests		
<50%	22	8.8
51-60%	92	36.8
61-70%	82	32.8
71-80%	42	16.8
81<%	12	4.8
Percentage in last Professional		
<50%	1	0.4
51-60%	23	9.2
61-70%	92	36.8
71-80%	127	50.8
81<%	7	2.8

surprised to see that the frequencies were cut down the middle with 122(48.8%) considering themselves to be more fit at the time they were questioned and 128(51.2%) considered themselves to be less fit than they previously were. We attempted to determine what this change in physical fitness did to their study capabilities and found that 64(25.6%) considered that their study capabilities had dimi-nished, 68(27.2%) reported that their study capabi-lities had improved and 118(47.2%) had no change in their study capabilities. In an attempt to assess their present academic performance we inquired as to how well they did in their previous professional examination and recent class tests. We found out that 22(8.8%) individuals averaged less that 50% in their last 5 class tests, 92(36.8%) reported that they averaged 50-60% in their last 5 class tests, 82(32.8%) reported that they had an average in the range 61-70% in their last 5 class tests, 42(16.8%) individuals reported to have secured an average of 71-80% in their last 5 class tests and only 12(4.8%) individuals had a score above 80% in their last 5 class tests. When the question about the marks that they attained in their previous professional examination arose, only 1(0.4%) individual reported that he secured less than 50%, 23(9.2%) reported to obtain marks in the 50-60% range, 92(36.8%) reported that they obtained marks in 61-70% range, 127(50.8%) individuals reported that they had secured marks in the 71-80% range and only 7(2.8%) secured marks above 80%.

Table 2: *Comparsion Between Cumulative Physical Activity (CPA) And Cumulative Academic Performance (CAP)*

Cumulative Physical Activity (CPA)	CUMULATIVE ACADEMIC PERFORMANCE (CAP)			Total	
	Poor (0-4)	Average (5-7)	Good (8-10)		X^2=6.664 P=.155
Poor(0-6)	3 (10.3%)	21 (72.4%)	5 (17.2%)	29	
Average (6-13)	19 (11%)	107 (62.2%)	46 (26.7%)	172	
Good (14-24)	7 (14.2%)	37 (75.5%)	5 (10.2%)	49	
Total	29	165	56	250	

DISCUSSION

The complexity of the physical activity and fitness relationship makes it an arduous task to specify possible mechanisms. Generally, physical activity can improve physical fitness particularly when long standing attitudes target increased fitness. The results of a study conducted by The University of Cincinnati,[14] stated that no definite correlation exists between physical activity and the physical fitness of students.

Furthermore, the medical students think highly of their own physical health[14,21]. This is in contrast to what we have recorded during our course of the research, in which we observed that 122(48.8%) considered themselves to be more fit at the time they were before their admission in the medical college, while 128(51.2%) considered themselves to be less fit than they previously were.

In a study conducted by the University of British Columbia on the exercise behavior and attitudes among 4th year medical students,[22] 64% of the 4th year students met the CSEP guidelines of the minimum of exercise required to be classified as moderate to vigorous activity per week, and 73% of the students met the previous standards established in 1998. This is in contrast to what we observed among the 4th year students of AIMC, 29(11.6%) individuals had poor physical fitness, 172(68.8%) had average physical fitness and 49(19.6%) individuals had good physical fitness, from the total of 250 correspondents.

After the analysis of the data collected, we tried to create a correlation between the Cumulative Physical Activity (CPA) and the Cumulative Academic Performance (CAP) (TABLE#23), out of the individuals with poor cumulative physical activity 3(10.34 %) had poor academic performance; there were 21(72.41%) with average academic performance and 5(17.24%) had good academic performance. The individuals with average cumulative physical activity had 19(11.04%) that had poor academic performance; there were 107(62.20%) that had average academic performance and 46(26.74%) had

good academic performance. The individuals with good cumulative physical activity had 7(14.29%) that had poor academic performance; there were 37(75.51%) with average academic performance and 5(10.20%) had good academic performance. We found that those individuals having average physical fitness were academically superior to those who fell on the extremes of the physical fitness spectrum.

Individuals with poor and good physical fitness followed similar trends in relation to academic performance. This is somewhat related to a research conducted the University of Illinois,[23] according to which there was a direct and exponential relationship between academic achievements and total fitness, with results dictating that those with greater physical fitness levels scored better across the board (Total achievements, reading, mathematics).

Another article[24] further corroborates the research conducted by the University of Illinois (previously cited), by proving that there is a positive association between academic achievements in most of the academic subjects and majority of health related physical fitness components.

The discrepancy between our findings and those in the articles cited maybe due to a myriad of reason. First of all, the students who gave better thought to their physical fitness and had a good cumulative physical performance, gave no time to their studies, and hence couldn't perform well. Unfortunately, our study was not able to eliminate the possibility of the student's attitudes towards both physical fitness and academic performance. There were no questions formulated to measure a student's motivation towards their academics or physical fitness. Students who excel in school and immerse themselves in the school experience, maybe more likely to exert more effort on physical fitness and academic tests. Laboratory procedures such as VO2 max remain more valid measures of aerobic fitness. Voluntary participation and the timing at which our research was conducted might have been one of the reasons for the discrepancy in the results. A social desirability bias maybe manifested as a result of self-report surveys. All the participants were from the same medical college, so generalizing the results is not possible. Certain factors that affect physical fitness and may affect academic performance such as smoking, alcohol consumption and other such behaviors were not taken into consideration.

CONCLUSION

The conclusion of my study is:

- The physical fitness of most of the medical students in the study was of an average level.
- We found that those individuals having average physical fitness were academically superior to those who fell on the extremes of the physical fitness spectrum.
- Individuals with poor and good physical fitness followed similar trends in relation to academic performance.

RECOMMENDATIONS

- Medical students should be offered programs that provide an environment to enable them to achieve the recommended amount of PA per week.
- Curriculums should be designed in such a manner that they integrate PA into its core and further propagate the positive message of bringing PA from the Future Doctor to the patient.

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