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## The Impact of Physical Activity on the Academic Performance among Medical and Health Sciences Students: A Cross Sectional Study from RAKMHSU - Ras Alkhaimah-UAE

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### Abstract

Physical activity is a crucial component of school curricula as it is suggested to increase the students' academic performance. This may be applied in the university age group, especially when considering medical and health sciences colleges where higher stress levels are recorded. Aim: To assess the relationship between physical activity and academic performance among medical and health sciences students. Methods: an online questionnaire-based cross sectional study involved 198 students from RAK Medical and Health Sciences University was conducted to identify the level of physical activity and academic performance. Results were tabulated and analyzed using SPSS. Results: there was significant positive correlation between physical activity and academic performance ( $r = 0.208$ ). However, the correlation was higher for BDS College with no significant difference with regard to nationality, age and gender.

**Keywords:** Physical activity, academic performance, university students, sports, medical university.

### Introduction

Physical education has traditionally been considered an essential part of curricula to promote a range of benefits including general health, cognitive, development, motor skills and social behavior<sup>[1, 2]</sup>. The philosophy "Healthy Body, Healthy Mind" was the motive behind the inclusion of physical education along with the curriculum subjects. Physical education is the systematic education of physical activity to develop a man physically, mentally, emotionally and socially competent through an active medium. Physical activity is defined as any bodily movement produced by voluntary body muscles that require energy expenditure. The term "Physical activity" should not be confused with "exercise". Exercise is a subclass of physical activity that is planned, structured and repetitive for a certain purpose<sup>[3]</sup>.

Physical education can help the students to develop the knowledge, attitudes, motor and behavior skills, and confidence needed to adopt and maintain physically active lifestyle<sup>[4]</sup>. The outcomes of a quality physical Activity program are very important to adolescents. Bodily benefits of sports activities, like improved aerobic power, increased muscle strength, and fighting obesity<sup>[5]</sup> have been demonstrated clearly. Furthermore, athletic participants score higher grades in school and have higher educational aspirations than non-participants have<sup>[6]</sup>. Participation in sports has also been related to greater satisfaction with body image<sup>[7]</sup>. Moreover, sports participation has been associated with lower scores on measures of loneliness<sup>[8]</sup> and anxiety<sup>[9, 10]</sup>. Therefore, physical education may not be considered extracurricular; it is rather a vital component in students' academic success. Several studies suggested that increased physical activity during the school time could induce arousal and lessen boredom, which lead to increase classroom concentration and attention span. In addition to that, one study suggested that increased activity levels might be related to improve classroom behavior as well as academic performance<sup>[11]</sup>. Academic performance refers to "how students deal with their studies and how they cope with or accomplish different tasks given to them by their teachers. It is also the ability to study and remember facts and being Able to communicate your knowledge verbally or down on paper"<sup>[12]</sup>.

At university level, there is many elements, which affect the participation of the students in the physical activities like; university environment, extracurricular activities, family environment, parents' education, community, university spirit, schedule of physical education and classroom activities.

Medical education is inherently stressful and demanding with an overwhelming burden, which leaves minimal opportunity for the students to relax and recreate. Medical and health sciences student's life is subjected to different kinds of stressors, such as the pressure of academics with success obligation, uncertain future and difficulties predicted for system involvement. These students face social, emotional, physical and family problems, which may affect their learning ability and academic performance [13]. Direct indicators of academic achievement include grade-point averages, scores on standardized tests, and grades in specific courses. In addition to that measures of concentration, memory, and classroom behavior can provide indirect estimates [14]. Nowadays, Most of the universities have large number of students from different countries with extremely variable cultures and backgrounds. Medical and health sciences university students represent an important segment of our young population and constitute a good deal of the total population. The sports officers in medical universities in our region are finding many difficulties in encouraging students to participate in sports activities because of the highly demanding medical education, as noted earlier. This may be one of the subtle factors that affect the academic performance of these students and there is no study, in this region at least, to measure the involvement of medical students in sports and to relate that to their academic performance.

**Research Objectives**

To assess the relationship between physical activity and academic performance among medical and health sciences students.

**Research Methodology**

A questionnaire based Study was conducted in RAK Medical and Health Sciences University - Ras Alkhaimah – UAE from the period of October 2014 to December 2014 after obtaining the ethical approval from the University Research and Ethics Committee (on 29.10.2014). The study aimed to include more than 200 participants from both genders in the four constituent colleges; Medical, Dental, Pharmacy and Nursing. The questionnaire was online based including socio-demographic data about students' age, family income, family education and residency. It also included graded evaluation of their physical activities and academic performance during the academic year (2013-2014). The GPA of the participants was checked and the sports participation claimed by the students was crosschecked with the sports officer records. The questionnaire was constructed with reference to similar previous studies and according to the recommendation of World Health Organization (WHO) [3, 15] the questions were modified to fit the local conditions for our students. Finally, administrative and academic faculty validated the questionnaire. The incomplete entries were excluded then the data were collected in a worksheet and analyzed statistically using the SPSS software (IBM SPSS version 19).

**Results**

The total number of participants was 198 with 65 male students (33%) and 133 females (67%). There was equal number of participants from MBBS and BDS Colleges (57

each) while Pharmacy students were 46 and 38 students from the Nursing College. The students' age ranged from below 18 years to above 24 years with majority (56%) in the age range (18-20 years) followed by (35%) in the range (20-22 years old). The students came from different nationalities as there were 49% from the Middle East, 36% Asians, 12% Africans and 3.5% Americans. The sports, which showed more participation, were walking, jogging and running, and dancing. Table 1 and Fig1 show the frequencies of the physical activity categories and the GPA of the participants, respectively. According to the WHO recommendations, only less than 40% of our students met the recommended duration of physical activity per week (the recommended physical activity is 150 minutes or more per week)

**Table 1:** The distribution of the physical activity categories of the participants

Level of physical activity	Frequency	Percentage
< 30 minutes per week	17	8.6
31- 59 minutes per week	47	23.7
60–89 minutes per week	57	28.8
90–150 minutes per week	37	18.7
> 150 minutes per week	40	20.2
Total	198	100.0



**Fig1:** The frequency of students in the GPA ranges

The mean GPA of the total sample was (3.39 ± 1.35). However, the mean GPA was higher for females with statistically significant difference (Table 2). On the other hand, higher physical activity levels are more predominant among male students (Fig 2). The Nationality of the participants did not affect the level of physical activity and the GPA, as there were no significant differences in their means among the different nationalities.

**Table 2:** Comparison of the mean GPA between males and females

	Mean (SD) of GPA		t statistics (df)	p value*
	Males	Females		
GPA	3.03 (1.39)	3.56 (1.322)	6.859 (1)	0.01

\*Independent t-test

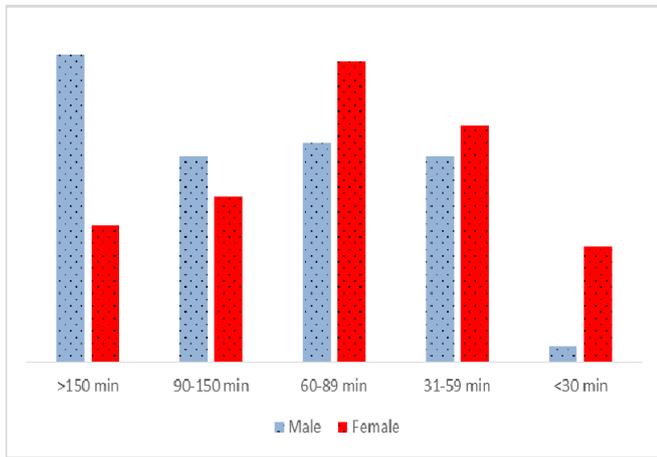


Fig 2: Percentage of physical activity levels gender-wise

When the constituent colleges were considered in the analysis, the difference in the GPA was statistically significant only between Pharmacy and Dental Colleges (Table 3). With reference to Fig3, it can be noticed clearly that most of the MBBS students fall in the high physical activity levels while most of BDS students fall in the low physical activity levels. In general, the level of physical activity and the students' performance (GPA) showed statistically significant positive correlation as shown in table (4). On the other hand, it was found that the correlation was highest for the BDS College students ( $r = 0.33$ ) while other colleges showed very weak correlation ( $r$  for MBBS = 0.02, B.Pharm= 0.08 and BSN = 0.18). Furthermore, when it was considered gender-wise, the correlation showed some difference, yet not significant.

Table 3: Comparison of the mean physical activity and GPA for the four constituent colleges

	Mean (SD)				t statistics (df)	p value*
	MBBS	BDS	B. Pharm	BSN		
GPA	3.49 (1.27)	2.84 (1.39)	3.91 (1.21)	3.42 (1.41)	5.82 (3)	0.001**

\*ANOVA test

\*\*significant difference by post-hoc test was found between B. Pharm and BDS

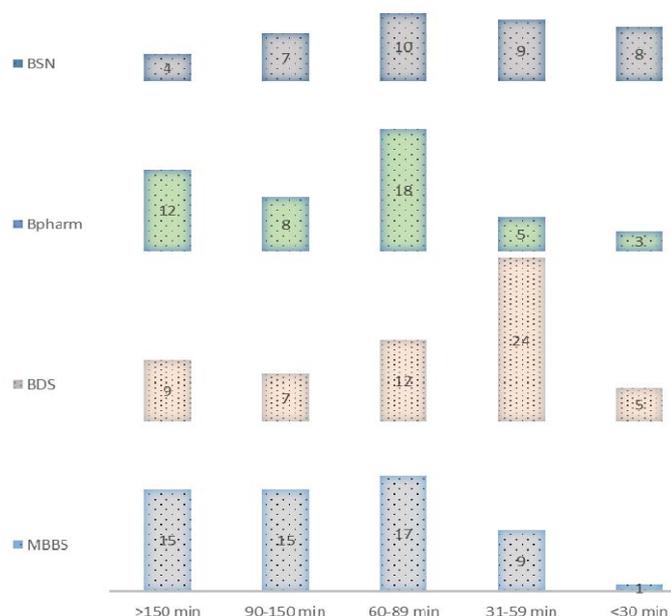


Fig 3: Frequency of Physical activity levels college-wise

Table 4: Correlation between the level of physical activity and the GPA of RAKMHSU Students

	GPA	
	r	p value*
Physical activity	0.206	0.004

\*Pearson correlation

Discussion

Several studies were conducted to assess the relationship between physical activity and academic performance. However, these studies focused on the school age students and adolescents [16, 17, 18]. In this study, the relationship between physical activity and academic performance was assessed in college students' age which represents a major difference from other studies because participation in physical activity in this age group is exclusively optional and self-driven as there are no regular sports sessions or classes. Different colleges, which in turn reflect the academic stress, and variable nationalities would increase the variability in our study population as well. Dwyer *et al.* and Pate *et al.* studies on school children and adolescents could not find difference in the correlation between sports and physical activity when gender was considered [19, 20]. On the other hand, Brandi *et al.* found inverse relationship between 1-mile run and language and mathematics scores in female school children (3<sup>rd</sup> – 5<sup>th</sup> grades) while male students did not show the same relationship [21]. Comparatively, in our study the female students showed higher GPA with lower physical activity levels and the correlation between the two scores approached zero. Inversely, male students showed lower GPA and higher physical activity level but the correlation followed the general sample findings to be positive. These findings disagree with several researches which demonstrated stronger relationship between fitness and academic achievement in females rather than males [22, 23].

Due to lack of similar studies on university age students in general and for medical colleges in specific, it was difficult to compare our results with other populations. The correlation was weak in MBBS, B. Pharm and BSN Colleges while the highest correlation was found in the BDS College. This may be explained by the fact that the Dental College students need to stand up for several hours in the dental clinics, which adds a physical burden to the academic burden and hence they benefit more from being physically fit. With regard to MBBS, B. Pharm and BSN Colleges, other factors may play more important role in controlling the academic achievement such as socioeconomic status and self-esteem. In general, the correlation was in consistency with most of the previous studies, which found significant relationship between physical activity and academic performance by using different study designs. In spite of the positive finding in this study, it is worthy to mention that Medical and Health sciences colleges' students fall under tremendous stress due to the overloaded curriculum and thus we would not expect satisfactory level of physical activity.

Research Limitations

The study was conducted in RAK Medical and Health Sciences University during the period of October 2014 to December 2014. As the questionnaire was internet-based, the students' participation was not granted and some results were unauthentic. Moreover, the physical activities inside our campus include indoor activities only such as gym, table tennis and billiards while outdoor activities are practiced after the college hours and the sports facilities are in a separate building.

### Conclusion and recommendations

Similar to school age students and adolescents, the college age students benefit from the physical activity to improve their academic performance in spite of their tight timings, overloaded curriculum and variations in their gender, nationalities and study materials. Here, we recommend that physical activities for this age group should be encouraged by the university administration by promoting sports competitions and providing more sports facilities and free timings to motivate students for more participation.

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