# Association of Sport and Exercise with Health Condition and Academic Performance: A Cross Sectional Study Among University Students in Bangladesh

## *Spor ve Egzersizin Sağlık Durumu ve Akademik Performansla İlişkisi: Bangladeş'teki Üniversite Öğrencileri Arasında Kesitsel Bir Çalışma*

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**ABSTRACT**

**Objective:** Exercise and sport offer conveniences to health and general quality of life. In this regard, this study was undertaken to evaluate the impact of sport and exercise on mental and physical health, as well as academic performance among the university students in Bangladesh.

**Material and methods:** A cross-sectional study involving 639 university students (51.2% athletes and 48.8% non-athletes) aged 18-26 years was conducted from December 2017 to March 2018. Statistical analysis was performed by using the SPSS software (version 20) and Microsoft Office Excel 2010.

**Results:** Mental health condition of athletes was significantly ($p<0.001$) better, as they suffered less anxiety (30.3% mild, 4.3% moderate, 1.2% severe anxiety) and depression (31.2% mild, 5.8% moderate, 1.5% moderately severe but no cases in severe depression) compared with non-athletes (47.4%, 21.5%, 11.2% respectively and 40.7%, 28.1%, 12.5%, 5.8% respectively). The prevalence of overweight and obesity were less frequent among athletes (5.2% and 0.9%) compared with non-athletes (13.1% and 3.9% respectively). Athletes were much more physically fit than non-athletes, as the occurrence of different physical problems, mainly GIS-related diseases were less frequently observed in them. Though performances of athletes were better, their academic result was not as good as non-athletes (over moderate GPA 31.1% vs 16.5%) ($\chi^2=21.099$; $p<0.001$). Athletes who participated in sport or exercise almost daily or 4-5 days per week, had better health condition but lower academic results than athletes who engaged in for 2-3 days.

**Conclusion:** The propensity of anxiety, depression, overweight, obesity and physical illness among university students can be reduced by inspiring them or creating chance to take part in sports and exercise.

**Keywords:** Exercise, anxiety, depression, health, academic success, university students

**ÖZ**

**Amaç:** Egzersiz ve spor sağlığı ve genel yaşam kalitesini destekler. Çalışma, bu bağlamda, Bangladeş'teki üniversite öğrencilerinde spor ve egzersizin akademik performansın yanı sıra zihinsel ve fiziksel sağlık üzerindeki etkisini değerlendirmek için yapıldı.

**Gereç ve yöntem:** Aralık 2017-Mart 2018 tarihleri aralığında 18-26 yaşları arasındaki 639 üniversite öğrencisini (%51.2 sporcu ve %48.8 sporcu olmayan) kapsayan kesitsel

bir çalışma yapıldı. İstatistiksel analizde SPSS yazılımı (sürüm 20) ve Microsoft Office Excel 2010 kullanıldı.

**Bulgular:** Sporcuların akıl sağlığı durumu, gerek kaygı (%30.3 hafif, %4.3 orta, %1.2 şiddetli kaygı) gerekse depresyon (% 31.2 hafif, % 5.8 orta,% 1.5 orta derecede şiddetli ve şiddetli depresyonda 0 vaka) skorları olarak sporcu olmayanlara kıyasla (sırasıyla %47.4, %21.5 ve %11.2 ile %40.7, %28.1, %12.5 ve %5.8) anlamlı derecede (p<0.001) daha iyi idi. Aşırı kilo ve obezite prevalansı sporcular arasında (%5.2 ve %0.9) sporcu olmayanlara göre (sırasıyla %13.1 ve %3.9) göre daha azdı. Sporcular, sporculara göre fiziksel olarak daha uygun oldukları için GİS başta olmak üzere fiziksel rahatsızlıkları daha seyrek gözlendi. Sporcuların performansları daha iyi olmasına karşın, akademik sonuçları sporcu olmayanlar kadar iyi değildi (orta üstü GPA'ları %31.1'e karşı %16.5) (χ2=21.099; p<0.001). Neredeyse her gün veya haftada 4-5 gün spor veya egzersize katılan sporcuların, 2-3 gün spor yapan sporculara kıyasla daha iyi sağlık durumları, ancak daha düşük akademik sonuçları vardı.

**Sonuç:** Üniversite öğrencilerinin kaygı, depresyon, aşırı kilo, obezite ve fiziksel hastalık eğilimleri, spor ve egzersize katılımları sağlanarak azaltılabilir.

**Anahtar sözcükler:** Egzersiz, kaygı, depresyon, sağlık, akademik başarı, üniversite öğrencileri

## INTRODUCTION

One of the most essential human functions and demands across the lifespan is physical activity (1). Exercise is a subset of physical activity that is planned, structured, repetitive, to improve and maintain physical fitness (2). Exercise and sports provide benefits to mental and physical health, functional ability, and general quality of life. Increased motor learning and social skills, and the development of creativity are also associated with sports and recreation (3).

Exercise and sport reduce stress, anxiety, depression, obesity and frequency of illness by improving immune system (4); and help building healthy bones, improve muscle mass and strength; and happiness, healthy life style and better quality of life (5-7). However, the tendency to participate in sports and exercise in about one third of student athletes decline after beginning of university education (8-10). The lack of eagerness may lead to physical inactivity among students, which is a great public health challenge in the developed world, and is recognized as a global epidemic.

Several studies were conducted among athletes in different countries to evaluate the effect of exercise and sports on students' health and performance (6,7,9,11). Association was found between physical activity and health among athletes in these studies, but there is no such investigation carried out among Bangladeshi university students, for whom the impact is not clear. Considering the aforementioned evidence, the present study was undertaken to evaluate the impact of physical exercise and sports on health and academic performance among university students in Bangladesh.

## MATERIALS AND METHODS

***Study design:*** This cross-sectional study was carried out to investigate the impact of sport and exercise on mental and physical health as well as academic performance among university students in Bangladesh from December 2017 to March 2018.

***Study area:*** Respondents were selected from six reputed public universities of Bangladesh. As there are more than 35 public universities in Bangladesh, it was not possible to cover all universities during the study period. The specific areas were selected by the field investigators based on the availability of student athletes. Time and distance were also considered to select the study areas.

***Participants:*** Participants for the investigation group were informed about the study. To reduce the risk of bias, participants were identified with the help of students' ID card. This study included only respondents who were easily available for data collection and volunteered to give information. Students involved in exercise or sports, or both at least for 20-30 min/d and 2-3 d/wk were selected as the athlete group. Students spending no time in sports or exercise

constituted the non-athlete control group. Students who involved in sports and exercise only once a week, and those who did not feel comfortable to give information were excluded from the study.

***Sample size:*** A simple random sampling technique was used for the selection of participants. Initially 750 participants of the specified areas were selected. From which, the total participants within the desired criteria were 639 students aged 18-26 years including first to fourth year undergraduates, of which 327 participants constituted the investigation group, and 312 the control group. In the investigation group 292 were males and 35 were females, and in the control group figures were 268 and 44, respectively.

***Study questionnaire:*** Anxiety (12) and depression (13) were categorized according to the GAD-7 (General Anxiety Disorder-7) and depression test questionnaire PHQ-9 (Patient Health Questionnaire-9). A physical health problem questionnaire was also adopted from formerly published study (14). Some questions were modified and developed by the research team, as for example: questionnaire for class performance and academic results. The GPA of academic achievement was measured on a scale out of 4.00. We categorized the GPA into three levels such as below moderate (GPA: below 3.00); moderate (GPA: 3.00-3.49) and over moderate (GPA: 3.50-4.00).

***Data collection:*** The questionnaires were distributed to the selected students, written consent forms that explained the purpose of the research with the assurance of their confidentiality were obtained. The students were told that their participation was anonymous and entirely voluntary, and there was no reward for taking part. Authors answered questions or clarified any possible doubts, and collected filled questionnaires.

***Statistical analysis:*** All data obtained were entered into a Microsoft Office Excel 2010 spreadsheet and exported for analyses using the SPSS software version 20.0 (SPSS Inc., Chicago, IL, USA). The p values were calculated by chi-square test to compare group data. An alpha level ≤0.05 was considered as significant at the 95% confidence level. The Microsoft Office Excel 2010 program was used for data analysis, and for chart, graph and diagram preparation. Odds-ratio was calculated to identify the association of anxiety, depression, BMI and academic result with sport and exercising days per week. OR=1 indicates the reference value, OR>1 the risk value and OR<1 an out of risk value.

**Table 1.** Characteristics of participants

| Items | Sub-group | Athletes (n=327) | Non-ath (n=312) |
|---|---|---|---|
| **Gender** | Female | 35 (10.7) | 44 (14.1) |
| | Male | 292 (89.3) | 268 (85.9) |
| **Age group** | 18-20 yrs | 61 (18.7) | 68 (21.8) |
| | 21-23 yrs | 188 (57.5) | 172 (55.1) |
| | 24-26 yrs | 78 (23.9) | 72 (23.1) |
| **Year of study** | 1st Yr | 71 (21.1) | 64 (20.5) |
| | 2nd Yr | 82 (25.1) | 69 (22.1) |
| | 3rd Yr | 98 (30.0) | 94 (30.1) |
| | Final Yr | 76 (23.2) | 85 (27.2) |
| **Exercise/sport frequency** | 2-3 d/wk | 82 (25.1) | - |
| | 4-5 d/wk | 156 (47.7) | - |
| | 6-7 d/wk | 89 (27.2) | - |

*Figures as n (%)*

**RESULTS**

***Socio-demographic profile***

Table 1 reveals that 51.2% of the respondents were athletes, while 48.8% comprised non-athletes. The highest numbers of athlete and non-athlete students were in the age range of 21-23 yrs with 57.5% and 55.1%, respectively. Age group, study year and weekly exercise or sport participation distributions are also given in the table.

***Sports and exercise***

Sports types involved in are given in Figure 1, with the highest number of students (80%) being involved in cricket. Most of the students reported that they took part in more than one type of sports or exercise.
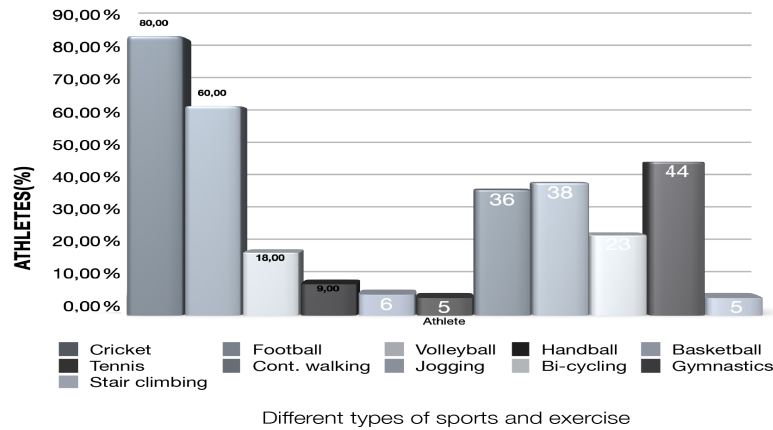


**Figure 1.** Types of sports and exercise participation of the students

***Mental health (anxiety and depression levels)***

Anxiety and depression levels are compared in Table 2, demonstrating significant differences (p<0.001) between athlete and non-athlete students, with more favorable results for athletes for mild, moderate and severe anxiety levels. The study also revealed that female athletes were more anxious than their male counterparts. Athletes were also less depressed than non-athletes, again at each depression level. Both genders rated almost equally in mild depression, but males reported higher levels in both moderate and moderately severe depression levels.

**Table 2.** Anxiety (GAD-7) and depression (PHQ-9) level comparison of subjects

| Items | Athletes | | | Non-athletes | | |
|---|---|---|---|---|---|---|
| | Males | Females | Total | Males | Females | Total |
| **No A** | 190 (65.1) | 20 (57.1) | 210 (64.2) | 46 (17.2) | 16 (36.4) | 62 (19.9) |
| **Mild A** | 86 (29.5) | 13 (37.1) | 99 (30.3) | 134 (50.0) | 14 (31.8) | 148 (47.4) |
| **Mod A** | 12 (4.1) | 2 (5.7) | 14 (4.3) | 59 (22.0) | 8 (18.2) | 67 (21.5) |
| **Sev A** | 4 (1.4) | 0 | 4 (1.2) | 29 (10.8) | 6 (13.6) | 35 (11.2) |
| $\chi^2$; $p^a$ & $p^b$ | 1.58; 0.663 | | | 10.2; **0.017*** | | 149.3; **<0.001*** |
| **No D** | 178 (61.0) | 23 (65.7) | 201 (61.5) | 27 (10.1) | 13 (29.6) | 40 (12.8) |
| **Mild D** | 91 (31.2) | 11 (31.4) | 102 (31.2) | 108 (40.3) | 19 (43.2) | 127 (40.7) |
| **Mod D** | 18 (6.2) | 1 (2.9) | 19 (5.8) | 85 (31.7) | 3 (6.8) | 88 (28.1) |
| **Mod-Sev D** | 5 (1.7) | 0 | 5 (1.5) | 33 (12.3) | 6 (13.6) | 39 (12.5) |
| **Sev D** | 0 | 0 | 0 | 15 (5.6) | 3 (6.8) | 18 (5.8) |
| $\chi^2$; $p^a$ & $p^b$ | 1.31; 0.728 | | | 19.7; **<0.005*** | | 198.8; **<0.001*** |

*A: anxiety; D: depression; Mod: moderate; Sev: severe; data as n (%); statistics by chi-sq. ($\chi^2$) test (degrees of freedom, df: 3 for anxiety, 4 for depression); *: p<0.05; $p^a$: btw genders; $p^b$: btw athletes and non-athletes*

### Body mass index (BMI)

Based on BMI classification, the prevalence of underweight, overweight and obesity were more frequent among non-athletes compared with athletes as presented in Figure 2. In terms of gender differences, there were no female athletes in the obese level but there were more underweight and overweight female athletes than the males (Figure 3).
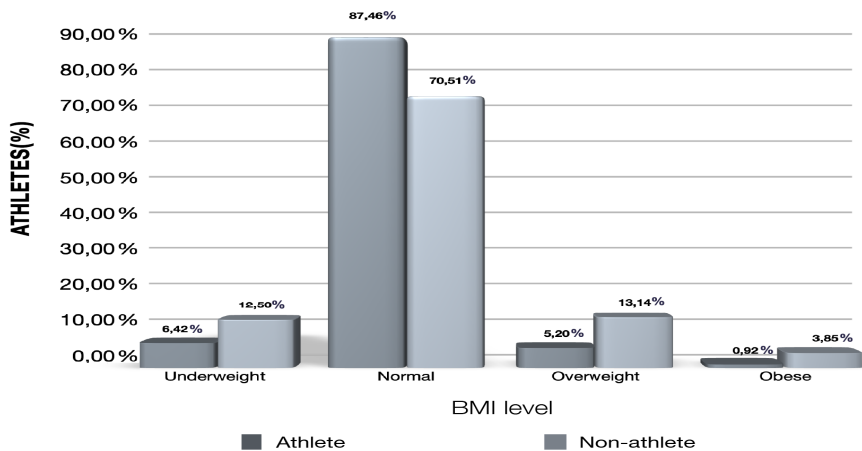


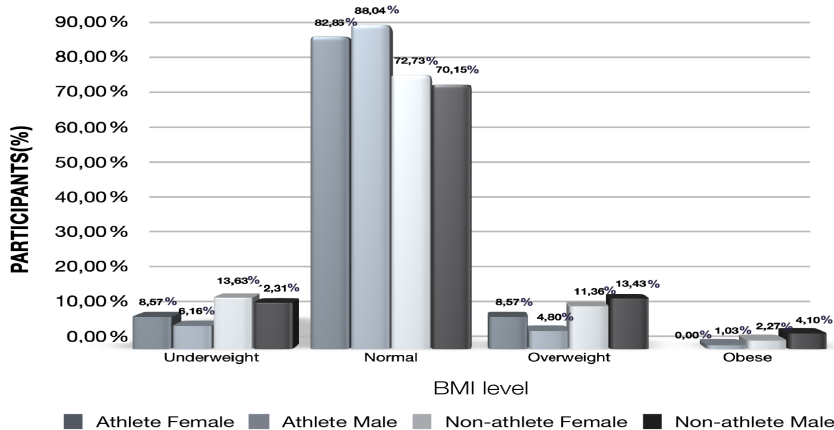**Figure 2.** BMI levels for athletes and non-athletes



**Figure 3.** BMI levels for athletes and non-athletes, by gender

### Physical health problems

Physical health condition of athletes was better than that of non-athletes. All indicators of physical health condition, except BMI, given in Table 3 revealed significant difference between athletes and non-athletes. Both athletes and non-athletes reported highest rates at 1-2 frequency for each illness type. Non-athletes rated higher percentages at each frequency level for any physical health problem. Among athletes, females were more frequently attacked by fever, headache, GIT and respiratory problems ($p<0.001$), and almost in each frequency level of any illness, they reported higher rates than males.

### Class performance

The comparative performance in class between athletes and non-athletes is given in Table 4. Individual items, like feeling stress in exam hall, and presentation, discussion or answering questions in class statistically significantly better in non-athletes ($p<0.001$ each). In case of completing assignment and listening attentively to the lecture, there were no significant

differences between groups; also non-athletes thought that their performances were increasing day by day. Female athletes felt more stress than males in the exam hall.

### Academic results

Academic results are presented in Table 5. They differed significantly ($p<0.001$) between athletes and non-athletes; with most students having moderate results for both groups. Non-athlete students had better results than athletes, as they rated more at the over moderate level (31.1% vs 16.5%), and less at the below moderate (8.6% vs 14.7%). In terms of gender differences, females had better academic results in both athlete and non-athlete groups, rating more at the over moderate level, and less at the below moderate one.

### Association of anxiety, depression, BMI level and academic results with sports and exercise days per week

Increasing sports or exercise days per week decreases anxiety, depression and academic result, and causes better BMI condition. Table 6 displays that only athlete students who exercise 2-3 d/wk reported moderate anxiety (17.1%; OR=0.67) and moderately severe depression (6.1%; OR=0.17). Obesity was also only observed among athletes who participated in sports or exercise at this frequency (OR=0.05). Athletes who are engaged in sports or exercise almost daily had the highest rates at the below-moderate grade levels (OR=0.23), and the lowest ones at the over-moderate grade levels (OR=0.07), compared with the other athletes. Contrarily, athletes who engaged in sports or exercise 2-3 d/wk had the highest rates at the over-moderate grade levels (OR=0.73), and the lowest ones at the below-moderate grade levels (OR=0.26), compared with the rest (Table 6).

**Table 3.** Comparison of physical health conditions between athletes and non-athletes

| Parameter | Freq | Athletes | | | Non-athletes | | |
|---|---|---|---|---|---|---|---|
| | | Males | Females | Total | Males | Females | Total |
| **Fever** | 1-2 x | 60 (20.6) | 10 (28.6) | 70 (21.4) | 103 (38.4) | 15 (34.1) | 118 (37.8) |
| | 3-4 x | 10 (3.4) | 8 (22.9) | 18 (5.5) | 24 (9.0) | 4 (9.1) | 28 (9.0) |
| | 5-6 x | 1 (0.3) | 3 (8.6) | 4 (1.2) | 3 (1.1) | 3 (6.8) | 6 (1.9) |
| | more | 0 | 0 | 0 | 2 (0.8) | 2 (4.6) | 4 (1.8) |
| | none | 221 (75.7) | 14 (40.0) | 235 (71.9) | 136 (50.8) | 20 (45.5) | 156 (50.0) |
| $\chi^2$; p$^a$ & p$^b$ | | 45.2; **<0.001*** | | | 17.8; **0.026*** | | 34.5; **<0.001*** |
| **GIT problem** | 1-2 x | 65 (22.3) | 13 (37.1) | 78 (23.9) | 113 (42.2) | 20 (45.5) | 133 (42.6) |
| | 3-4 x | 18 (6.2) | 3 (8.6) | 21 (6.4) | 60 (22.4) | 9 (20.5) | 69 (21.2) |
| | 5-6 x | 11 (3.8) | 2 (5.7) | 13 (4.0) | 14 (5.2) | 5 (11.4) | 19 (6.4) |
| | more | 12 (4.1) | 0 | 12 (3.7) | 15 (5.6) | 2 (4.6) | 17 (5.8) |
| | none | 186 (63.7) | 17 (48.6) | 203 (62.1) | 66 (24.6) | 8 (18.2) | 74 (24.0) |
| $\chi^2$; p$^a$ & p$^b$ | | 6.1; 0.194 | | | 7.9; 0.096 | | 101.7; **<0.001*** |
| **Headache** | 1-2 x | 116 (39.7) | 16 (45.7) | 132 (40.4) | 117 (43.7) | 20 (45.5) | 137 (43.9) |
| | 3-4 x | 21 (7.2) | 4 (11.4) | 25 (7.7) | 54 (20.2) | 6 (13.6) | 60 (19.2) |
| | 5-6 x | 15 (5.1) | 4 (11.4) | 19 (5.8) | 14 (5.2) | 2 (4.6) | 16 (5.1) |
| | more | 12 (4.1) | 1 (2.7) | 13 (4.0) | 15 (5.6) | 3 (6.8) | 18 (5.8) |
| | none | 128 (43.8) | 10 (28.6) | 138 (42.2) | 68 (25.4) | 13 (29.6) | 81 (26.0) |
| $\chi^2$; p$^a$ & p$^b$ | | 5.0; 0.288 | | | 5.4; 0.870 | | 30.1; **<0.001*** |
| **Resp. problem** | 1-2 x | 75 (25.7) | 7 (20.0) | 82 (25.1) | 83 (31.0) | 9 (20.5) | 92 (29.5) |
| | 3-4 x | 18 (6.2) | 5 (14.3) | 23 (7.0) | 24 (9.0) | 7 (15.9) | 31 (9.9) |
| | 5-6 x | 3 (1.0) | 4 (11.4) | 7 (2.1) | 12 (4.5) | 3 (6.8) | 15 (4.8) |
| | more | 7 (2.4) | 2 (5.7) | 9 (2.8) | 12 (4.5) | | 12 (3.9) |
| | none | 189 (64.7) | 17 (48.6) | 206 (63.0) | 137 (51.1) | 25 (56.8) | 162 (51.9) |
| $\chi^2$; p$^a$ & p$^b$ | | 21.7; **<0.001*** | | | 11.2; 0.207 | | 10.0; **<0.001*** |

*Data as n (%), statistics following chi-square ($\chi^2$) test (df: degrees of freedom 4 for any set of illness); *: $p<0.05$; p$^a$: btw genders; p$^b$: btw athletes and non-athletes; Freq: frequency; Resp: respiratory*

**Table 4.** Comparison of class performance parameters between athletes and non-athletes

| Parameters (answer) | Athletes | | | Non-athletes | | |
|---|---|---|---|---|---|---|
| | Males | Females | Total | Males | Females | Total |
| **CA (yes)** | 179 (61.3) | 25 (71.4) | 204 (62.4) | 162 (60.5) | 38 (86.4) | 201 (64.4) |
| **CA (no)** | 113 (38.7) | 10 (28.6) | 123 (37.6) | 106 (39.6) | 6 (13.6) | 111 (35.6) |
| **$\chi^2$; p$^a$ & p$^b$** | 1.4; 0.240 | | | 11.0; **<0.001*** | | 0.3; 0.593 |
| **IPDD (yes)** | 198 (67.8) | 22 (62.9) | 204 (62.4) | 159 (59.3) | 32 (72.7) | 197 (63.1) |
| **IPDD (no)** | 94 (32.2) | 13 (37.1) | 123 (37.6) | 109 (40.7) | 12 (27.3) | 115 (36.9) |
| **$\chi^2$; p$^a$ & p$^b$** | 0.4; 0.560 | | | 2.9; 0.090 | | 0.04; 0.843 |
| **FSEH (yes)** | 102 (34.9) | 31 (88.6) | 133 (40.7) | 196 (73.1) | 30 (68.2) | 226 (72.4) |
| **FSEH (no)** | 190 (65.1) | 4 (11.4) | 194 (59.3) | 72 (26.9) | 14 (31.8) | 86 (27.6) |
| **$\chi^2$; p$^a$ & p$^b$** | 37.3; **<0.001*** | | | 0.5; 0.490 | | 65.4; **<0.001*** |
| **LAL (yes)** | 117 (40.1) | 29 (82.9) | 220 (67.3) | 157 (58.6) | 35 (79.6) | 191 (61.2) |
| **LAL (no)** | 175 (59.9) | 6 (17.1) | 107 (32.7) | 111 (41.4) | 9 (20.4) | 121 (38.8) |
| **$\chi^2$; p$^a$ & p$^b$** | 23.2; **<0.001*** | | | 7.0; **<0.001*** | | 2.6; 0.110 |
| **PDAQ (yes)** | 160 (54.8) | 21 (60.0) | 146 (44.6) | 135 (50.4) | 30 (68.2) | 192 (61.5) |
| **PDAQ (no)** | 132 (45.2) | 14 (40.0) | 181 (55.4) | 133 (49.6) | 14 (31.8) | 120 (38.5) |
| **$\chi^2$; p$^a$ & p$^b$** | 0.3; 0.560 | | | 4.8; **0.030*** | | 18.3; **<0.001*** |

*CA: completing assignment; IPDD: increasing performance day by day; FSEH: feeling stress in exam hall; LAL: listening attentively to the lecture; PDAQ: presentation, discussion and answering questions; data as n (%); statistics by chi-square ($\chi^2$) test (df: degrees of freedom 4 for any set of illness); *: p<0.05; p$^a$: btw genders; p$^b$: btw athletes and non-athletes*

**Table 5.** Comparison of academic result between athletes and non-athletes

| Group | Gender | Academic result | | | $\chi^2$; p | |
|---|---|---|---|---|---|---|
| | | Below-moderate (GPA<3.00) | Moderate (GPA 3.00-3.49) | Over-moderate (GPA≥3.50) | p$^a$ | p$^b$ |
| **Athletes (n=327)** | Females | 2 (5.7) | 24 (68.6) | 9 (25.7) | 4.2; 0.125 | |
| | Males | 46 (15.8) | 201 (68.8) | 45 (15.4) | | 21.1; **<0.001*** |
| | Total | 48 (14.7) | 225 (68.8) | 54 (16.5) | | |
| **Non-athletes (n=312)** | Females | 2 (4.6) | 24 (54.5) | 18 (40.9) | 2.9; 0.239 | |
| | Males | 25 (9.3) | 164 (61.2) | 79 (29.5) | | |
| | Total | 27 (8.7) | 188 (60.2) | 97 (31.1) | | |

*Data as n (%); statistics by chi-square ($\chi^2$) test (df: degrees of freedom 2 for academic results); *: p<0.001; p$^a$: between genders; p$^b$: between athletes and non-athletes*

## DISCUSSION

Anxiety and depression are the most common mental problems, especially among students who do not involve in either sports or exercise. The present study revealed that anxiety and depression were significantly lower among Bangladeshi university athletes as compared with non-athletes. This finding is consistent with the results of a previous study conducted in Kerman University of Medical Sciences (15). Several studies conducted in USA reported lower anxiety and depressive symptoms among athletes (16). Athletic participation was also found to be directly related to lower levels of depression at universities in the Southeastern United States (17). Among German young athletes, only 20% of athletes had anxiety and depression (18). These findings support the current study. To be involved in sport or exercise may be the reason behind the lower level of anxiety and depression among athletes.

**Table 6.** Association of anxiety, depression, BMI and academic results with exercise frequency

| Items | Answer | Exercising days per week | | | | | |
|-------|--------|----------|-----|-----------|-----|-----------|-----|
| | | **6-7 days** (n=89) | **OR** | **4-5 days** (n=156) | **OR** | **2-3 days** (n=82) | **OR** |
| **Anxiety** | Normal | 74 (83.1) | 1.00 | 115 (73.7) | 1.00 | 21 (25.6) | 1.00 |
| | Mild | 15 (16.9) | 0.20 | 41 (26.3) | 0.36 | 43 (52.4) | 2.05 |
| | Moderate | 0 | - | 0 | - | 14 (17.1) | 0.67 |
| | Severe | 0 | - | 0 | - | 4 (4.9) | 0.19 |
| **Depression** | Normal | 73 (82.0) | 1.00 | 98 (62.8) | 1.00 | 30 (36.6) | 1.00 |
| | Mild | 16 (18.0) | 0.22 | 49 (31.4) | 0.50 | 37 (45.1) | 1.23 |
| | Moderate | 0 | - | 9 (5.8) | 0.09 | 10 (12.2) | 0.33 |
| | Moderately sev. | 0 | - | 0 | - | 5 (6.1) | 0.17 |
| | Severe | 0 | - | 0 | - | 0 | - |
| **BMI** | Underweight | 2 (2.3) | 0.02 | 8 (5.1) | 0.05 | 11 (13.4) | 0.19 |
| | Normal | 85 (95.5) | 1.00 | 143 (91.7) | 1.00 | 58 (70.7) | 1.00 |
| | Overweight | 2 (2.3) | 0.02 | 5 (3.2) | 0.03 | 10 (12.2) | 0.17 |
| | Obese | 0 | - | 0 | - | 3 (3.7) | 0.05 |
| **Academic result** | GPA<3.00 | 16 (18.0) | 0.23 | 21 (13.4) | 0.18 | 11 (13.4) | 0.26 |
| | GPA 3.00-3.49 | 68 (76.4) | 1.00 | 116 (74.4) | 1.00 | 41 (50.0) | 1.00 |
| | GPA≥3.50 | 5 (5.6) | 0.07 | 19 (12.2) | 0.16 | 30 (36.6) | 0.73 |

*Data as n (%); OR: odds ratio (OR=1.0, reference value; OR>1.0, risk value; OR<1.0, value out of risk)*

Mental problems might be more common among females than males. A study conducted among schoolchildren demonstrated significant higher anxiety and depression scores for female adolescents compared to male counterparts (19), similar to the present study for anxiety but opposite in the case of depression, where we found that males felt more depression than females. The reason of feeling depression in males may be due to career planning, as males have to take the responsibilities of their families in most Bangladeshi societies. Another study among Swedish adolescents and young adults revealed higher anxiety scores for females but no sex differences in depression scores (20). In addition, previous studies conducted in Germany and Hong Kong narrated significantly higher anxiety scores for females compared with males, but higher depression scores for males compared with females (21,22), in line with our study.

Based on BMI categories, the present study demonstrated about 6% underweight and less than 1% obese in all university athletic students, almost similar to a study conducted in Serbia and Turkey among athletes and other groups, where underweight and obese rates were 6.0% and 1.2% of the adults (23). The present study reported smaller overweight respondents compared with 20.4% overweight in Malaysia (24). The prevalence of overweight (8.6%) among female athletes was lower than previous findings in Greek adult female volleyball players (12.3%) (25). Motallebi and Noorbakhsh also reported that Iranian athletes had low physical problem rates, supporting the findings of the present study. Participation in sports activities causes less respiratory, cardiovascular or other physical illnesses (26).

Participation in sports or exercise might also influence to the achievement of educational goals. It may increase academic and extra curriculum activities, and impact on academic results. Athletes who responded in our study had higher rates in most items related to class performance. However, their academic results were not as good as non-athletes, which may be due to excessive involvement in sport or

exercise. This result diverged from a previous study conducted among school students in Spain that found physical activity through sports participation is associated with higher grade point averages, and academic ability based on a variety of cognitive outcome measures (27).

The study had some limitations as we faced some complications during the survey. Firstly, only six universities were covered due to time limit for the research work. So, the represented data does not give the whole scenario of all athlete students in the country. If the study was conducted in more universities, a more extensive scenario on the impact of physical exercise or sports on health and academic performance would have been possible for university students of Bangladesh. Secondly, students were less familiar with some terminologies and complications arose regarding understanding the questionnaire. They needed further explanation. Thirdly, universities were far apart, and it was somehow difficult to travel the long distances. Fourthly, many students were busy with their examinations and lab work, therefore collecting data from them was slightly difficult. It was also difficult to find out female athletes due to their lower participation in sports or exercise. Finally, social desirability bias may have impacted the responses, since the interviews were done in person.

## CONCLUSION

Physical activities and sports are considered as good practices for ensuring healthier lifestyle. The present research revealed that regular physical activity has positive impact on both mental and physical health among the university students. Overall, mental health condition of university athletic students is better as they suffer less anxiety and depression compared with non-athletes. Besides, athletes had better physical health condition compared with non-athlete individuals, as the occurrence of different physical problems; mainly GIT-related diseases were less frequent, with better BMI scores among athletes. Though physical activity plays a vital role on health, excessive involvement may hinder academic performance.

Our findings point that the propensity of anxiety, depression, overweight or obese state, and other illnesses among university students can be reduced by inspiring them or creating chances to take part in regular sports or exercise. Therefore, it is necessary to initiate departments of sports and exercise science in every university.

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