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# Low Back Pain of Faculty of Sport and Physical Education Students in Relation to Different Activities

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## Abstract

**Background:** Physical inactivity and intensive sports activity have been found to be associated with LBP. The aim of this study is the presents the data about the prevalence of LBP in young adults and its associations with vitality, physical activity and emotions. We also studied the impact of low back pain on daily activity. The study sample presented (n=323) students from the Former Yugoslav Republic of Macedonia and Bosnia and Herzegovina in the chronological age of 21.06 ± 1.93 years. The current study assessed the level of LBP amongst students of Faculty of Sport with the level of physical activity in last six months.

**Methods:** We used the questionnaire, which included the Graded Chronic Pain Scale (GCPS) for the evaluation of levels of chronic pain. With a Short Health Survey (SF-36) we tried to measure the health status.

**Results:** A total of (n=323) of all students had pain intensity at some point in last six months. All students reported (n=236, 73.0%) prevalence of LBP. In this study body mass index, level of physical activity were not significant independent predictors of intensity and disability scores.

**Conclusion:** 3/4 of all respondents said to have had any episode LBP. The results of our study can be used by officials in the area of prevention to support efforts to improve health of the student population and to reduce the LBP risk.

**Keywords:** Low back pain; Chronic pain; Depression; Physical activity

## Introduction

Low back pain (LBP) presents a significant health problem in all countries [1,2]. It is the leading factor of incapability for persons younger than 45 years. Long-lasting sick leaves compensation, with more than 90 lost working days [3]. Chronic low back pain is an important cause of personal suffering and disability with a number of aversive social consequences. Life-time incidence of acute, unspecific LBP in western industrial nations varies between 60% and 85% [1,4-6]. So far, more than 60 different measuring instruments have been identified, including questionnaires and clinical tests. In 1992 Von Korff et al. [7] developed a simple, brief questionnaire to assess the severity of chronic pain problems, the Chronic Pain Grade (CPG) based on measures of pain intensity and pain related disability [7]. There are a number of possible tools and questionnaires to assess LBP. Their overview is presented in Table 1, Von Korff's Chronic Pain Grade (CPG) questionnaire is among the most used ones and it has been successfully implemented for LBP epidemiological research in various surveys.

Physical activity is defined as any bodily movement resulting in significant increase of energy consumption, above the level of consumption in standstill. Physical activity is seen in many forms and contexts, and it is under strong influence of cultural heritage. Physical exercise understands planned, structured and recurring activity, with the aim to improve functional abilities of the body or to maintain health. Physical inactivity is supposed to be associated with higher risk for recurrent LBP [8], but there are contradictory results reported regarding the association of LBP with the level of physical activity and physical fitness [2,9,10]. Moreover, physical inactivity and intensive sports have been found to be associated with LBP in some [2,11], but not all studies [12,13]. Exercise has many benefits for those patients with LBP, including positive effects on mood, anxiety, and depression, which often plague these patients. So far, research on possible associations with specific types of sport is however sparse [14,15]. Schools tend to have time consuming curricula, possibly perpetuating a sedentary lifestyle, and a high prevalence of LBP [10].

The Body Mass Index (BMI), or Quetelet Index, is a heuristic proxy for estimating human body fat based on an individual's weight and height. BMI is defined as the individual's body mass divided by the square of his or her height ($kg/m^2$) [16]. This work presents the data about the 6-month prevalence of LBP in young adults university students of Faculty of Sport and Physical Education its associations with physical functioning.

| Questionnaire | Reference period | N. items | N. response options | Score range | Better function indication |
|---|---|---|---|---|---|
| Oswestry Disability Questionnaire [26] | Not specific | 10 | 6 | 0-100 | Lower scores |
| Quebec Back Pain Disability Scale [27] | Today | 20 | 6 | 0-100 | Lower scores |
| Rolland Morris Disability Questionnaire [28] | Today | 24 | 1 | 0-24 | Lower Scores |
| EuroQoL-5 Dimension Questionnaire (EQ-5D) [29] | Today | 5 | 3 | 0-100 | Higher scores |
| SF-36 Physical Functioning scale [24] | Now | 10 | 3 | 0-100 | Higher Scores |
| Waddell Disability Index [30] | Since onset of back pain | 9 | 2 | 0-9 | Lower scores |
| SF-36 Role Limitations, Physical scale [24] | Past 4 weeks | 4 | 2 | 0-100 | Higher scores |
| SF-36 Bodily Pain scale [24] | Past 4 weeks | 2 | 5 and 6 | 0-100 | Higher scores |
| Graded Chronic Pain Scale (GCPS) Questionnaire [7] | Past 6 months | 10 | 7 | 0-100 | Higher scores |

**Table 1:** Review of rating scales for low back pain and assessment tools.

According to ATA [10] LBP survey, 61% of Americans said they have experienced low back pain, and among them, 69% felt it has affected their daily lives. Women take medication for LBP more often than men. To relieve pain, 75% of women with LBP take over-the counter or prescription medications, compared to 67% of men. Americans spend at least US$ 50 billion each year on LBP, the most common cause of job-related disability and a leading contributor to absence from work. Other report Wenig et al. [17] shows that the average total LBP treatment costs per patient were estimated at € 1322 in Germany. In the workplace, low back pain is the most costly ailment, with an average cost of US$ 8000 per claim, and accounts for one third of workers compensation costs [18]. Recent reports [1,5,6,1824] on the prevalence of LBP in the young adult population (variously defined as the age group from 18 to 30 years) show high prevalence of LBP already in the young adulthood.

## Materials and Methods

### Design and sample

Enrolment in the study was on voluntary basis and it included (n=323) students from the former Yugoslav Republic of Macedonia and Republic of Bosnia and Herzegovina. A research sample was made of FFK-Faculty of Physical Education, Ss Cyril and Methodius University in Skopje, Republic Macedonia (n=97, mean chronological age of 20.3 ± 1.3 years), FTOS-Faculty of Physical Education and Sport, University of Tuzla, Republic Bosnia and Herzegovina (n=110, mean chronological age of 21.2 ± 2.1 years), and FASTO-Faculty of Sport and Physical Education, University of Sarajevo, Republic Bosnia and Herzegovina (n=116, mean chronological age of 21.4 ± 2.0 years). After approval by the University of Skopje, Tuzla and Sarajevo Research Ethics Committee, questionnaires were administered during free time. Answering the questionnaires took an average of 30 minutes. Measurements were carried out in the morning shift from 9-12 hours, in the academic year. The order of measurement was always the same. All pupils who participated in this study were subjected to testing under the same conditions, after having given their written agreement for participation.

### The sample of variable

The survey contained the following questions: AGE-year of birth, BMI-Body Mass Index (kg/m$^2$) and questions about physical activity: PA-average hours per week of physical activity (hours). With a physical activity questionnaires we tried to measure the physical functioning through two 2 questions: SA: Level of physical activity I: I do not practice sport regularly, II: I practice sport occasionally but not on a regular basis, III: I take part in sport at a recreational level and regularly, IV: I train in one or more sports regularly and I take part in competitions) and SSA: Hours of physical activity spend on average per week in the last six months I: 0-5 hours, II: 6-10 hours, III: 11-15 hours, IV: 16-20 hours, V: 21-30 hours).

The Graded Chronic Pain Scale (GCPS) is a standard self-assessment instrument used in medical pain research and quality management that offers a means of hierarchically classifying chronic pain severity independent of the pain syndrome [7]. In this study the scores "pain intensity" and "pain-related disability" were analyzed. The scores range from 0 to 100 points, with 100 being maximum pain intensity or disability.

This study used the questionnaire pain intensity (CPI) and pain disability scores (DS) are calculated as the average of three questions (questions 1-3 for pain intensity, questions 5-7 for disability) multiplied by 10, they range from 0 to 100 points. The fourth question assessed the number of days lost from the usual activity (such as school, work and housekeeping) due to LBP. Finally, a combination of pain intensity score and disability score were used to define the pain grade.

With a 36-Item Short-Form Health Survey (SF-36) we tried to measure the health status, of subjective sense of health through dimensions of (physical functioning, ten questions) [24]. Body height was measured using Martin's anthropometer with precision of 0.1 cm; BMI was measured using a Tanita TBF-300A Pro Body Composition analyzer scales 0.1 kg (Tanita Corp., Tokyo, Japan). Students were barefooted during measurements.

### The statistical analysis

The translation of the questionnaire was verified for internal consistency in our sample. This was done by the calculation of Cronbach's alpha (α) coefficient for the group of three questions dealing with pain intensity and three questions dealing with disability in the CPG questionnaire. Quantitative data is reported using means and standard deviation. Prevalence is reported as percentage with 95% confidence interval in parentheses. Using regression analysis we tried to find the impact of individual variables. Statistical analyzes were performed with SPSS v. 23.0 software (SPSS Inc., Chicago, IL, USA).

## Results

Internal reliability of questions dealing with (characteristic pain intensity, CPI) and (disability scores, DS) was tested with the Cronbach's alpha (α) reliability measuring coefficient. The reliability is considered to be acceptable for group comparisons where the Cronbach alpha amounts more than 0.70 [25]. In questions 1-3, the coefficient for FFK students was 0.75, FTOS 0.91 and for FASTO 0.89. Overall, it was 0.88. In questions 5-7, the coefficient for FFK students was 0.91, FTOS was 0.93, FASTO was 0.92 and total 0.92. These results can be compared with the previous researches [25] where the Cronbach's α amounted to 0.91 and research [5] Cronbach's α amounted to 0.77 for questions 1-3 and 0.88 for questions 5-7. On the average Table 2, the students (both female and male) spent 11.09 (5.54) hours on physical activity per week. Body Mass Index was in normal (healthy weight) limits 23.00 (2.52). Majority of students are in the zone of normal values BMI.

In Table 3 the total of 323 of the students 236 (73.0%) had pain intensity at some point in the last six months at the time they answered the questionnaire, another 87 (26.9%) answered no pain intensity. In questions dealing with pain disability 281 (86.9%) students answered no pain disability. Another, 34 (10.5%) had low intensity, 6 (1.8%) high intensity, 1 (0.3%) moderately limiting and 1 (0.3%) severely limiting.

| Variables | Faculties of Sport and Physical Education | | | |
|---|---|---|---|---|
| | FFK-Skopje | FTOS-Tuzla | FASTO-Sarajevo | Total |
| n, % | n=97, (30.0) | n=110, (34.0) | n=116, (35.9) | n=323, (100.0) |
| X, SD | X (SD) | X (SD) | X (SD) | X (SD) |
| AGE | 20.37 (1.33) | 21.25 (2.12) | 21.47 (2.02) | 21.03 (1.85) |
| BMI | 23.13 (2.53) | 22.94 (2.37) | 22.95 (2.66) | 23.00 (2.52) |
| PA | 10.28 (5.89) | 10.48 (4.71) | 12.51 (6.03) | 11.09 (5.54) |
| PN | 0.98 (1.96) | 2.24 (2.37) | 1.67 (2.15) | 1.63 (2.16) |
| WP | 2.15 (2.39) | 3.24 (2.71) | 2.77 (2.73) | 2.72 (2.61) |
| AP | 1.68 (1.85) | 2.65 (2.39) | 2.23 (2.63) | 2.18 (2.29) |
| DA | 0.96 (1.69) | 1.54 (2.05) | 1.25 (1.82) | 1.25 (1.85) |
| SA | 0.87 (1.65) | 1.45 (2.26) | 1.06 (1.84) | 1.12 (1.91) |
| WA | 0.60 (1.21) | 1.47 (2.26) | 1.07 (1.62) | 1.04 (1.69) |
| CPI | 8.73 (9.21) | 14.29 (12.37) | 11.88 (11.60) | 11.63 (11.06) |
| DS | 3.81 (6.96) | 7.89 (11.32) | 5.87 (8.56) | 5.85 (8.94) |
| SF03† | 95.15 (18.69) | 90.55 (22.73) | 90.74 (21.96) | 92.14 (21.12) |
| SF04† | 86.85 (33.83) | 76.87 (42.21) | 71.98 (44.95) | 78.56 (49.34) |
| SF05† | 84.19 (36.54) | 73.63 (44.12) | 68.67 (46.44) | 75.49 (42.36) |
| SF09(a)† | 50.38 (28.19) | 53.62 (25.87) | 51.42 (25.55) | 51.80 (26.53) |
| SF09(b)† | 58.02 (32.46) | 58.25 (29.51) | 58.37 (29.45) | 58.21 (30.47) |

n: Number of study participants; X: Mean; SD: Standard Deviation; AGE: Years; BMI: Body Mass Index; PA: Physical Activity (Hours spend for sport on average/week during last 6 months); PN: Pain Right Now; WP: Worst Pain; AP: Average Pain; DA: Daily Activities; SA: Social Activities; WA: Work Activities, CPI: Characteristic Pain Intensity; DS: Disability Score; SF03: Physical Functioning; SF04: Physical Health; SF05: Emotional Problems; SF09(a): Energy Functioning; SF09(b): Emotions Functioning. †Higher scores on the measures are indicative of better function (Normalized score 0-100).

**Table 2:** Descreptive statistics of study samples.

| Variables | Pain intensity n, (%) | | | | Pain disability n, (%) | | | |
|---|---|---|---|---|---|---|---|---|
| CPG | FFK, n=97 | FTOS, n=110 | FASTO, n=116 | Total, n=323 | FFK, n=97 | FTOS, n=110 | FASTO, n=116 | Total, n=323 |
| Zero | 32 (33.0) | 26 (23.6) | 29 (25.0) | 87 (26.9) | 86 (88.7) | 96 (87.3) | 99 (85.3) | 281 (86.9) |
| I | 65 (67.0) | 84 (76.4) | 87 (75.0) | 236 (73.0) | 10 (10.3) | 11 (10.0) | 13 (11.2) | 34 (10.5) |
| II | - | - | - | - | 1 (1.0) | 1 (0.9) | 4 (3.4) | 6 (1.8) |
| III | - | - | - | - | - | 1 (0.9) | | 1 (0.3) |
| IV | - | - | - | - | - | 1 (0.9) | | 1 (0.3) |

n, number of study participants; %, percentage; Zero: Pain free; I: Low disability, low intensity; II: Low disability, high intensity; III: High disability, moderately limiting; IV: High disability, severely limiting.

**Table 3:** Distributions of Chronic Pain Grade (CPG).

The prevalence of LBP in various young adult populations is given in the Table 4. It can be seen that although the prevalence of LBP is generally high, there are substantial differences in the prevalence in various countries and studies. The current study found a 6-month prevalence of 73.0%.

| Authors/Reference[a] | Year | Country | Participants | Number[b] | Recall | Percentage (%)[c] |
|---|---|---|---|---|---|---|
| Drozda et al. [20] | 2011 | Poland | Adolescents | 986 | - | 67 |
| Cakmak et al. [19] | 2012 | Turkey | Students | 1552 | - | 41 |
| Goubert et al. [22] | 2004 | Belgium | General | 85 | 6 | 37 |
| Bucar et al. [5] | 2012 | Slovenia | Students | 178 | 6 | 63 |
| Tezel et al. [31] | 2005 | Turkey | Students | 221 | 6 | 55 |
| Nyland and Grimmer [6] | 2003 | Australia | Students | 158 | 12 | 63 |
| Brennan et al. [1] | 2007 | Ireland | Students | 61 | 12 | 32 |
| Schmidt [23] | 2007 | Germany | General | 9263 | 12 | 76 |
| Wenig et al. [17] | 2009 | Germany | General | 5650 | 12 | 70 |
| Falavigna et al. [21] | 2011 | Brazil | Students | 416 | 12 | 67 |
| Smith et al. [32] | 2005 | China | Students | 207 | 12 | 40 |
| Videman et al. [33] | 2005 | Finland | Students | 174 | 12 | 54 |
| Smith et al. [34] | 2005 | Korea | Students | 202 | 12 | 39 |
| Smith et al. [35] | 2004 | Australia | Students | 260 | 12 | 59 |
| Feyer et al. [36] | 2000 | Australia | Students | 694 | 12 | 67 |
| Aggarwal et al. [37] | 2013 | India | Students | 160 | 12 | 47 |
| Noormohammadpour et al. [38] | 2015 | Iran | Students | 1335 | 12 | 39 |
| Vincent-Onabajo et al. [39] | 2016 | Nigeria | Students | 207 | 12 | 32 |
| Atikovic et al. [43] | 2017 | This study | Students | 323 | 6 | 73 |

[a]Reference number as listed in this manuscript, [b]Number of the participants in the study, [c]Prevalence rates rounded to the nearest whole number

**Table 4:** Low back pain prevalence rates among participants by recall period and year of publication.

The predictor system (Table 5) of all ten variables physical functioning in CPI ($R^2$) explains 26% and DS ($R^2$) explains 33% of the common variables with the criteria. The impact of the individual variables and showed that the highest and statistically most important influence of the criteria variable is as follows CPI: a) β: -0.227, p<0.000; f) β: -0.332, p<0.000 and DS: a) β: -0.200, p<0.001; c) β: -0.128, p<0.025; f) β: -0.367, p<0.000. It also showed that other seven factors index were statistically not significant in total. Four questions related to physical health in CPI ($R^2$) explains 11% and DS ($R^2$) explains 20% of the common variables with the criteria. The impact of the individual variables is statistically significant on three variables on this group questions CPI: d) β: -0.252, p<0.001 and DS: a) β: -0.125, p<0.031; d) β: -0.288, p<0.000. The entire system of predictor variables relating to emotional problems in CPI ($R^2$) explains 4% and DS ($R^2$) explains 6% of the common variables with the criteria. The results are shown only one statistically significant variable CPI: a) β: -0.173, p<0.010 and DS: a) β: -0.251, p<0.000. In a group of nine questions relating to energy and emotions the predictor system (Table 5) for CPI ($R^2$) explains 13% and DS ($R^2$) explains 11% of the common variables with the criteria. The most statistically important influence of the criteria variable are as follows two variables CPI: i) β: -0.206, p<0.022; e) β: -0.147, p<0.038 and DS: i) β: -0.229, p<0.012. Multiple regression analysis showed significant relationship between Low Back Pain Characteristics and SF-36 Subscales (p<0.05). However, a statistically significant relationship was seen between LBP and physical functioning, physical health, emotional problems, energy and emotions (Table 4).

<table>
<tr><th colspan="2">Variables SF Subscale</th><th>R</th><th>R²</th><th>Independent predictor variables</th><th>Beta</th><th>p value</th></tr>
<tr><td rowspan="5">SF03</td><td rowspan="2">CPI</td><td rowspan="2">0.514</td><td rowspan="2">0.264</td><td>a) Vigorous activities, such as running, lifting heavy objects, participating in strenuous sports?</td><td>-0.227</td><td>0.000</td></tr>
<tr><td>f) Bending, kneeling or stooping?</td><td>-0.332</td><td>0.000</td></tr>
<tr><td rowspan="3">DS</td><td rowspan="3">0.575</td><td rowspan="3">0.33</td><td>a) Vigorous activities, such as running, lifting heavy objects, participating in strenuous sports?</td><td>-0.200</td><td>0.001</td></tr>
<tr><td>c) Lifting or carrying groceries?</td><td>-0.128</td><td>0.025</td></tr>
<tr><td>f) Bending, kneeling or stooping?</td><td>-0.367</td><td>0.000</td></tr>
<tr><td rowspan="3">SF04</td><td>CPI</td><td>0.338</td><td>0.114</td><td>d) Had difficulty performing the work or other activities (for example it took extra effort)?</td><td>-0.252</td><td>0.001</td></tr>
<tr><td rowspan="2">DS</td><td rowspan="2">0.457</td><td rowspan="2">0.209</td><td>a) Cut down on the amount of time you spent on work or other activities?</td><td>-0.125</td><td>0.031</td></tr>
<tr><td>d) Had difficulty performing the work or other activities (for example it took extra effort)?</td><td>-0.288</td><td>0.000</td></tr>
<tr><td rowspan="2">SF05</td><td>CPI</td><td>0.201</td><td>0.04</td><td>a) Cut down on the amount of time you spent on work or other activities?</td><td>-0.173</td><td>0.01</td></tr>
<tr><td>DS</td><td>0.252</td><td>0.064</td><td>a) Cut down on the amount of time you spent on work or other activities?</td><td>-0.251</td><td>0.000</td></tr>
<tr><td rowspan="3">SF09</td><td>CPI</td><td>0.371</td><td>0.138</td><td>i) Did you feel tired?</td><td>-0.206</td><td>0.022</td></tr>
<tr><td rowspan="2">DS</td><td rowspan="2">0.331</td><td rowspan="2">0.11</td><td>e) Did you have a lot of energy?</td><td>-0.147</td><td>0.038</td></tr>
<tr><td>i) Did you feel tired?</td><td>-0.229</td><td>0.012</td></tr>
<tr><td colspan="7">CPI, Characteristic pain intensity; DS, Disability score; Beta, individual impact of each standardized predictor variable on the criterion variable; p, the set level of statistical significance of each predictor variable's impact on the criterion variable p<0.05.</td></tr>
</table>

**Table 5:** Multivariate linear regression analysis with low back pain intensity and disability score as dependant variables and SF Subscale as independent variables.

## Discussion

In one similar study, researchers Jespersen et al. [40] find: 1) the correlation between LBP intensity and hours of leisure time physical activity (LTPA) throughout the 52 weeks was low and non-significant, and 2) maintaining LTPA during an episode of acute LBP did not have a positive effect on LBP in the following 4 weeks. The correlation between weekly (LTPA) and LBP data was negative, but numerically low (r=-0.069) and statistically insignificant (p=0.08). For example, one study [41] suggests the mechanisms by which exercises may prevent low back pain: 1) they strengthen the back muscles and increase trunk flexibility; 2) they increase blood supply to the spine muscles and joints and intervertebral disks, minimizing injury and enhancing repair and 3) they improve mood and thereby alter the perception of pain. Many clinicians have recommended exercise for patients with low back pain. However, it has not clearly been determined what type and how much exercises one should carry out [41]. Looking at the differences between the genders, it can be stated that female students are less active than male students [42]. Having in mind that the questionnaire did not include the reasons for physical inactivity, we can guess that it lays in large amount of school and house related commitments. Engagement in sport and recreational activities and body mass index in this study did not show statistically significant negative impact on LBP, because majority of students are in the zone of normal values BMI. There are no clear associations with biological parameters such as BMI [11,13]. The start of the student life is an important period in the life of each individual. It represents the start of the period with increased responsibility and independence, but, at the same time, it results with poorer health status, involving worse nutrition and nutritive habits, and rapid reduction of physical activities.

Associative factors vary across studies. In this study gender as a not significant factor is of great concern in this young population entering the workforce and en route to a greater exposure to risk factors for pain intensity but it is with a negative sign for pain disability. In view of the gender difference in pain prevalence, there is clearly a need for more research into the reasons underlying the gender difference. Findings concerning an association with gender have been ambiguous [11,12]. Bucar et al. [5] found that females had higher intensity and disability scores. Competitors had higher pain disability scores than students engaging in sports at recreational level. Gender and level of physical activity were significant independent predictors of intensity and disability scores at multivariate linear regression. In this study Brennan et al. [1] reported that physically less active students could be at an even higher risk for suffering from LBP: medical schools tend to have a time consuming curricula with a great deal of learning material. The academic rigor of such a curriculum might perpetuate a sedentary lifestyle among medical students, possibly making them prone to the occurrence of LBP [6,10]. In this study, the strongest relations of LBP with vitality were found for two factors: vigorous activities: such as fast running, lifting heavy objects, participating in strenuous sports and bending, kneeling or stooping. The influence of engagement in physical activity or vitality in sports in relation to LBP has been variably reported: it was associated to LBP as a protective factor, in other reports the influence of sports as physical activity was not an independent factor of LBP [9]. As reported, Brennan et al. [1] showed two significance factors as having an association with lower back pain. They were age and hours of personal training physical activity. All other factors investigated (height, weight, body mass index, gender, academic program, year of study, hours of academic program physical activity, number of sports participated in within academic program and the number of sports participated in within personal training) were not found to be significant. The paper from the authors Harreby et al. [11] gives the four most painful activities in relation to LBP as also observed in our study: lifting or carrying heavy loads, forward bending, sitting for more than half an hour and job activities. It is evident that with such a high prevalence of LBP more data on the etiology and risk factors is needed and that the risk factors may differ from one population to the other. According to the literature, exercise has positive effects on LBP [1,2,9]. Interventional studies published in the last years have shown beneficial effects of specific workout programs such as pilates [2] or other specific lumbar muscle control exercises for amelioration of LBP. Links have also been found between occupational activities (lifting and loading) and lower back pain [1,9]. Although previous research indicates that very low levels of physical activity may increase back pain, our results suggest that excessive physical activity (vigorous activities, such as: running, lifting heavy objects, participating in strenuous sports) may also increase pain incidents due to activities of daily living (ADLs) [42,43].

In general, the proposition that more research is needed in the future to investigate the relationship between low back pain and college sports activities, and to develop a better understanding of the relationships between sport-specific loading on the lumbar spine for each sport and the impact that such a loading may have. This would hopefully lead to the development of management techniques and LBP prevention tactics that can be applied to younger patients who participate in sports.

Variables which were not assessed in this study but should be investigated in future studies are: tobacco smoking, previous low back injury, sleeping material (type), physical characteristics of the respondents, posture mostly adopted during daily activities, psychological distress, a comparison of college study programs, gender, and to identify which sports activities in the course are associated with the development of LBP.

It would be necessary to take account of the basic elements of pain assessment: the distribution of pain, the quality of pain, the duration of pain, the way pain occurs, factors that aggravate pain and reduce the impact on daily life and sleep activities, associated symptoms, the circumstances and manner of first pain, previous similar symptoms, prior treatment, and the current treatment.

## Conclusion

In our setting and results there is a high prevalence of LBP amongst students population of Faculty of Sport and Physical Education, with several modifiable risk factors identified. In this study, SF03: vigorous activities: such as fast running, lifting heavy objects, participating in strenuous sports and bending, kneeling or stooping, lifting or carrying groceries, SF4: Had difficulty performing the work or other activities, Cut down on the amount of time you spent on work or other activities, SF05: Cut down on the amount of time you spent on work or other activities, SF09: Did you feel tired, did you have a lot of energy were significantly associated with LBP.

We believe that future studies should look at rarely investigated constructs such as: anxiety, family history, and degenerative diseases of the joints, osteoporosis, depression, smoking, menstrual cycle and take anatomic differences in muscle strength into account. Students at risk of LBP need to modify their activity and postures during ADL to prevent painful movements. The results of our study can be used as evidence with officials in the area of prevention, to support efforts to improve the health of student populations and to reduce the risk to suffer of LBP. Information about LBP and preventive workout programs should be incorporated into study programs.

Student population may be rather ignorant about LBP and students would often want access to more information about this problem. The knowledge and exercises for LBP prevention should be introduced to physically active young adults and adolescents during the organized learning process in high-school and university study processes.

## Conflicts of Interest

The authors declare that they have no conflicts of interest.

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