

## SOCIODEMOGRAPHIC FACTORS AND LOW BACK PAIN IN MUNICIPALITY PHYSICAL ACTIVITY PROGRAMS FOR FEMALE PARTICIPANTS

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**Abstract.** *The purpose of this study was to investigate the relationship between low back pain (LBP) and factors such as education level and years of work in 131 women aged 42±1.10 years, participating in the "Sports for All" municipal physical activity (PA) programs in Greece. To evaluate how PA affects the intensity of pain, the questionnaires "Grading the Severity of Chronic Pain-GSCP" and the "A Fear-Avoidance Beliefs Questionnaire-FABQ" were used. Analysis of Variation and the Tuckey post hoc tests calculated the difference among the questions of each of the questionnaires. Statistically significant differences were determined for three questions. Female participants with a medium or low level of education show less or no improvement in LBP. Concerning years of work, participants with fewer years of work suffer from higher LBP levels than the ones already working for longer time. Future studies of the relationship between specific PA programs, the content and nature of one's job and the appearance of LBP are needed.*

**Key words:** *Low Back Pain, Intensity, Working Experience, Education Level*

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## INTRODUCTION

Low back pain (LBP) constitutes a common daily problem for the general population and is recognized by the medical community as a very important public health problem with particular economic and social implications. LBP results in reduced productivity due to reduced working time, increased absenteeism, and early retirement due to disability, while also contributing to poor quality of life as it negatively affects both physical as well as one's mental, emotional and social well-being (Shahzad, 2017).

Leclerc et al. (2009) reported that the two dominant categories of LBP relate to either factors of the work environment (movement mode, content, and type of work, loads, years of work, etc.), or demographics and the sociological characteristics that shape employees' lifestyles (gender, age, education level, tobacco and alcohol consumption, etc.). The socioeconomic status of individuals, as a multifactorial approach to the phenomenon, is a factor that significantly influences the occurrence of LBP (Ikeda et al., 2019). Other variables that affect LBP concern the socio-economic level of the participants, in particular level of education and years of work.

Research results have shown that low education levels correlate with various diseases and pathological conditions, including musculoskeletal diseases and more particularly LBP (Dionne et al., 2001; Hagen, Zwart, Svebak, Bovim, & Stovner, 2005; Aittomäki, Lahelma, Rahkonen, Leino-Arjas, & Martikainen, 2007; Schmidt et al., 2007). In particular, a negative correlation between education level and LBP has been reported in research, with participants with low or intermediate levels of education suffering more from LBP, and an even stronger correlation with participants reporting lower levels of education; on the other hand, for participants with higher education levels the only correlation found was when they were in a driving position for more than four hours (Shiri et al., 2019). The relative risk of suffering from LBP appears to be higher for those with low education levels compared with those with higher levels of education (Ikeda et al., 2019).

Several researchers' findings that studied the relationship between years of work and LBP appear to be inconsistent, but rather divergent. More specifically, the results of studying the relationship between LBP and with limited activity show a positive association of the intensity of LBP and age, and years of work (Loy, Warner-Czyz, Tong, Tobey, & Roland, 2010). On the contrary, a different survey (Wami, Abere, Dessie, & Getachew, 2019) regarding LBP among hotel employees showed that these employees with fewer working years had higher rates of LBP compared to those who had many years of work. In 2018 Lallukka and associates, after 28 years of research in the field, concluded that employees with few years of work presented statistically significantly higher levels of LBP compared to those who already worked for more years. In addition, in the same study, women were more likely than men to report having LBP, with those with a low level of education reporting having LBP more often.

Many studies have focused on physical activity (PA) and exercise as a means of reducing LBP, reducing movement restrictions due to pain, and reducing the fear-avoidance feeling concerning movement due to pain, while also improving the patients' overall quality of life (Kosmas, Georgiou, Marmara, & Fotiou, 2019; Salas et al., 2019; Vanti et al., 2019; Đurđević, Mazić, Janković, & Isaković (2019). In Greece, popular PA programs named "Sports for All", aimed at mass citizen participation in PA and exercise activities, are primarily focused on improving the health of the participants in total, contributing significantly to the improvement of public health. These programs are implemented by Municipal Sports Organizations on municipal premises and refer to female

trainees (Alexandris, Papadopoulos, Paliatia, & Vasiliadis, 1999; Afthinos, Theodorakis, & Nassis, 2005). However, these programs follow specific standards in their content that refer to the general population and not to participants with specific characteristics such as those suffering from LBP.

The literature review does not show any research attempt involving a group of women participating in municipal PA programs who suffer from LBP. More specifically, there no research has been implemented to investigate the relationship between LBP and labor and social-demographic variables, such as education level and years of work. The purpose of this study is to investigate the relationship between LBP and the factors of education level and years of work among women participating in the "Sports for All" municipal PA programs in Greece.

## METHODS

This survey was conducted from January 2017 to June 2017. From a population of approximately  $n=1500$  women who participated in the "Sports for All" programs, those who reported suffering from LBP were  $n=131$ . The mean age of the women reporting LBP was  $M=42\pm 1.10$  while the two extremes were identical to the values of those of the total sample ( $min=18$  and  $max=66$  years).

To evaluate LBP intensity, the questionnaire "*Grading the Severity of Chronic Pain*" by Von Korff, Ormel, Keefe, and Dworkin (1992) was used. At the same time the Waddell, Newton, Henderson, Somerville, and Main (1993) "*A Fear-Avoidance Beliefs Questionnaire* (FABQ)" questionnaire was also used to measure whether and how PA affects the intensity of pain from the intra-articular corticosteroids.

The FABQ questionnaire consists of 8 questions on a five (5) point Likert scale rated from totally disagree (1) to totally agree (5). Concerning the GSCP, there are 8 questions on a ten (10) point Likert scale, from 0=no pain to 10=the worst possible pain (questions 1-4). The fifth question "*For how many days, during the last six months, have you been absent from your usual activities (work, school, home, sports) due to back pain? (Number) days of abstinence*". The sixth question, about the effect of pain on any activity, is rated from 0=no effect up to 10=impossible to exercise. The seventh question about changes in the ability to participate in creative/social/family activities due to pain is rated from 0=no change up to 10=huge change. The eighth question about the ability to participate in creative/social/family activities due to pain is rated from 0 up to 10 where 0=no change and 10=huge change. For the GSCP questionnaire the Cronbach  $\alpha$  coefficient ranged between 0.811-0.976, while for the FABQ questionnaire the Cronbach  $\alpha$  coefficient ranged between 0.877-0.984.

The correlation in the test-retest control (questionnaire reliability) was within the accepted values. The reliability of an instrument is defined as its relation to the consistency or repeatability of the measurement (Thomas, Nelson, & Silverman, 2015). In the present survey, the questionnaire was translated into the Greek language, completed by 55 persons. Furthermore, the questionnaire was redistributed to the same persons after 48 hours without them being informed beforehand that a test-retest control will take place to test the reliability (Chaory et al., 2004). The results of each question were separately and overall compared to those provided in the new questionnaire.

**Table 1** Test-retest control correlation

		GSCP		FABQ
Q1	p<0.01	0.811	p<0.01	0.977
Q2	p<0.01	0.976	p<0.01	0.956
Q3	p<0.01	0.937	p<0.01	0.853
Q4	p<0.01	0.970	p<0.01	0.951
Q5	p<0.01	0.976	p<0.01	0.984
Q6	p<0.01	0.960	p<0.01	0.877
Q7	p<0.01	0.884		
Q8	p<0.01	0.925		
M		0.929875		0.933

## RESULTS

**Years of work**

The years of work reported by participants ranged from  $min=1$  to  $max=36$  and the mean was  $M=14.25\pm 0.795$  (Table 2). This shows us a level of variance concerning the participation's mass character of the PA programs, the different ages and the different work years of the participants.

**Table 2** The average value and standard deviation for years of occupation

Years of work	Mean	Standard Deviation
	14.25	0.795

The descriptive statistics and the analysis of variance show that in three questions (Question 12b Question Q4, Question Q5) there are statistically significant differences  $F(5,125)=4.07, p=0.002, F(5,125)=3.49, p=0.05, F(5,125)=5.09, p=0.000$ , respectively. No statistically significant differences were observed for the remaining questions ( $p<0.05$ ).

The Tukey post hoc analysis of statistically significant differences between different groups of working years indirectly showed for Question 12b "How will you rate at present the pain you feel?" there was a statistically significant difference between women who had 1 to 6 years of experience at work ( $M=4.44\pm 1.48$ ) and women with working experience of 13-18 years ( $M=3.34\pm 0.70$ ). In other words, participants with most years of work experienced less LBP at present, while those with fewer years of work declared significantly higher levels of pain. For Question Q4 "I should not do activities that could aggravate my pain", there was a statistically significant difference between participants with 1-6 years of work experience ( $M=5.69\pm 1.63$ ) and participants with 13-18 years of work experience ( $M=4.21\pm 1.33$ ). Participants with fewer years of work were more determined to participate in activities that would make their LBP worse than the participants who had more years of work. Similarly, for Question Q5 "I cannot do activities that would exacerbate my pain" there was a statistically significant difference between participants who had 1-6 years of work experience ( $M=5.08\pm 1.77$ ) and participants whose work experience was 13-18 years ( $M=3.18\pm 1.61$ ). This shows that women in training programs with fewer years of work experience are not willing to do activities that would exacerbate their pain, while participants who worked more years (13-18) were not sure if their LBP would be worsened or not.

**Table 3** Descriptive statistics and ANOVA of years of work

Question	Source of Variance	Sum of squares	df	Mean Squares	F	p
que12a	Groups	12.188	5	2.438	1.766	.125
	Error	172.545	125	1.380		
	Total	184.733	130			
que12b	Groups	30.325	5	6.065	4.078	<b>.002*</b>
	Error	185.904	125	1.487		
	Total	216.229	130			
que12c	Groups	3.512	5	.702	.631	.677
	Error	139.190	125	1.114		
	Total	142.702	130			
que12d	Groups	2.638	5	.528	.470	.798
	Error	140.278	125	1.122		
	Total	142.916	130			
que12e	Groups	22.787	5	4.557	1.260	.285
	Error	452.130	125	3.617		
	Total	474.916	130			
que12f	Groups	13.961	5	2.792	1.195	.315
	Error	291.948	125	2.336		
	Total	305.908	130			
que12g	Groups	15.040	5	3.008	2.223	.056
	Error	169.128	125	1.353		
	Total	184.168	130			
que12h	Groups	3.297	5	.659	.405	.845
	Error	203.603	125	1.629		
	Total	206.901	130			
Q1	Groups	10054	5	2.011	.719	.610
	Error	349.488	125	2.796		
	Total	359.542	130			
Q2	Groups	11.781	5	2.356	1.265	.283
	Error	232.769	125	1.862		
	Total	244.550	130			
Q3	Groups	2.320	5	.464	.194	.964
	Error	298.474	125	2.388		
	Total	300.794	130			
Q4	Groups	40.228	5	8.046	3.498	<b>.005*</b>
	Error	287.497	125	2.300		
	Total	327.725	130			
Q5	Groups	71.443	5	14.289	5.091	<b>.000*</b>
	Error	350.802	125	2.806		
	Total	422.244	130			
Q6	Groups	18.245	5	3.649	1.728	.133
	Error	263.999	125	2.112		
	Total	282.244	130			

Legend: Significance set at level \* p<0.05

### Level of education

The level of education of the participants in PA programs is shown in Table 4. There are two prevailing levels of education. One is primary school graduates (34.3%) and the other is junior high and high school graduates (48.9%). Women who hold a university, postgraduate or doctoral degree are the least present (16.8%).

**Table 4** Level of training of participants in PA programs (N=131)

	N	f (%)
Primary School	45	34.3
Junior High School-High School	64	48.9
University	22	16.8
Total	131	100.0

Table 5 shows statistically significant differences for three questions (Question 12c Question 12d, Question 12f, respectively), [ $F(2,128)=5.93, p=0.003, F(2,128)=4.02, p=0.020, F(2,128)=6.65, p=0.002$ ]. No statistically significant differences were observed for the remaining questions ( $p<0.05$ ).

The Tukey post hoc analysis of statistically significant differences showed that for Question 12c "*During the last six months how intense was the worst LBP you felt*" there was a statistically significant difference between participants who were primary school graduates ( $M=3.93\pm 1.07$ ) and participants who were junior high school and high school graduates ( $M=3.26\pm 0.97$ ). Interpreting this means that the primary school graduate participants felt more intense pain than the junior high or high school graduate participants.

For Question 12d "*During the last semester and on average, how severe was the LBP you felt?*" a statistically significant difference was noted between primary school graduate participants ( $M=3.84\pm 0.97$ ) and junior high school and high school graduate participants ( $M=3.36\pm 1.09$ ). The usual pain that the primary school graduate participants felt was on average more pronounced than that of the junior high school-high school participants during the last semester.

For Question 12e "*How many days in the last semester did you abstain from your usual activities (work, school, home, sports) due to LBP (days off)*" a statistically significant difference was noted between primary education graduate participants ( $M=5.2\pm 1.53$ ) and junior high school- high school group of participants ( $M=4.15\pm 1.55$ ). The number of days of absence from various activities of the first group of graduates was higher than that of the second group, respectively.

For Question 12f "*During the last semester, how much did the LBP affect you in your daily activities in your daily activities?*" no statistically significant differences were found between participants with different levels of education.

**Table 5** Descriptive statistics and ANOVA of the level of education

Question	Source of Variance	Sum of squares	df	Mean squares	F	p
que12a	Groups	2.569	2	1.285	.903	.408
	Error	182.164	128	1.423		
	Total	184.733	130			
que12b	Groups	3.474	2	1.737	1.050	.355
	Error	212.755	128	1.662		
	Total	216.229	130			
que12c	Groups	12.100	2	6.050	5.930	<b>.003*</b>
	Error	130.603	128	1.020		
	Total	142.702	130			
que12d	Groups	8.452	2	4.226	4.023	<b>.020*</b>
	Error	134.464	128	1.050		
	Total	142.916	130			
que12e	Groups	18.209	2	9.104	2.552	.082
	Error	456.707	128	3.568		
	Total	474.916	130			
que12f	Groups	28.816	2	14.408	6.656	<b>.002*</b>
	Error	277.092	128	2.165		
	Total	305.908	130			
que12g	Groups	3.422	2	1.711	1.212	.301
	Error	180.746	128	1.412		
	Total	184.168	130			
que12h	Groups	15.255	2	7.627	5.094	<b>.007*</b>
	Error	191.646	128	1.497		
	Total	206.901	130			
Q1	Groups	11.966	2	5.983	2.203	.115
	Error	347.576	128	2.715		
	Total	359.542	130			
Q2	Groups	2.801	2	1.401	.742	.478
	Error	241.749	128	1.889		
	Total	244.550	130			
Q3	Groups	8.176	2	4.088	1.788	.171
	Error	292.618	128	2.286		
	Total	300.794	130			
Q4	Groups	2.017	2	1.008	.396	.674
	Error	325.708	128	2.545		
	Total	327.725	130			
Q5	Groups	4.835	2	2.417	.741	.479
	Error	417.409	128	3.261		
	Total	422.244	130			
Q6	Groups	.937	2	.469	.213	.808
	Error	281.307	128	2.198		
	Total	282.244	130			

*Legend:* Significance set at level \*  $p < 0.05$

## DISCUSSION

The purpose of this study was to investigate the relationship between education level, years of work and LBP among female participants of municipal mass sports programs "Sport for All". The determination of the relationship between socio-demographic factors and LBP, in participants in mass participation PA programs is an open field with a high research interest. In the research community there are insufficient research results regarding LBP issues related to proportionate factors, except very few studies that contribute significantly to their useful conclusions (Kosmas, Marmara, & Stergioulas, 2008).

The results of this study concluded that female participants in the "Sport for All" PA program with a medium or low level of education show less or no improvement in LBP. These results are in line with recent results of the investigated area where the education level acts as a predictor of LBP (Alonso-García & Sarría-Santamera, 2020). Probably the nature of the participants' work, due to their relatively low education level associated with elevated levels of physical job requirements and the specificity of the movements that the specific job requires, do not contribute to the reduction or the elimination of the symptom of LBP. The usual pain reported by participants with lower education levels participants was, on average, more intense than that of participants with higher education levels. The possible misunderstanding of the instructions given by the physical education (PE) teachers with the participants' level of education might be a factor which plays a key role in the final result of the intensity of LBP, such as misunderstanding the instructions by using obscene terms on behalf of the PE experts can lead to wrong execution on the part of the participants, which results in no improvement at all and can even be harmful. Besides, the number of days of absence from various activities (including work) of primary school graduates was more than those who had completed a junior high school-high school education, a finding which agrees with previous results (Dionne et al., 2001; Hagen et al., 2005; Schmidt et al., 2007; Aittomäki et al., 2007).

Concerning years of work, the results of the present study show that participants with fewer years of work declare that they suffer higher LBP levels than the ones already working for a longer time. Though the participants with fewer years of work seem to be more determined to follow PA programs that might make their LBP worse than participants with more years of work, they are less willing to do other kinds of activities that might exacerbate their LBP than those with more years of work. This specific ambiguity of the results of the present study can be reflected in the results of previous research. Some of them show that the severity and the levels of LBP were higher in the groups of participants with fewer years of work (Lallukka et al., 2018; Wami et al., 2019), while others surveys present their results that more years of work contribute to higher levels and more severe incidents of LBP (Loy et al., 2010). The conclusion that follows from the above is that the results of the present research are ambiguous, just like the results of previous research and no clear picture can be deduced. However, participants with more years of work felt less LBP, while those with fewer years of work had significantly higher LBP levels. This may indicate that the multitude of years of work creates a culture of prior knowledge which leads to experience and then acts as a deterrent to such phenomena.

The designers of such programs should also introduce specialized programs targeting a special population with special needs, among them individuals who suffer from LBP. Programs should be adapted to socio-demographic factors such as years of work and the education level of the participants. PE teachers should, on the one hand, formulate and



adapt the content of the programs according to the physical condition of the participants, while on the other hand, they should use simple words without possible obscure scientific expressions, to make their instructions more comprehensible and thereby avoid any possible misunderstanding on the part of the participants that may lead to incorrect performance of some exercise, thus either creating or exacerbating an existing LBP problem.

This kind of segmentation should meet the challenges of our time, as we live in a very dynamic era where adaptation and flexibility are a must to any form of change. At the same time this gives an advantage to any sports organization if flexible and perhaps personalized programs are presented, with some of them based on the relationship between socioeconomic factors and the LBP. This would be a step in the right direction since it would not serve the impersonal implementation of programs, but the deeper purpose of mass sports programs which are ultimately to improve the physical, mental and social well-being of citizens, with direct and indirect beneficial effects.

### CONCLUSIONS

It is likely that less educated women and people in general are engaged in manual or even heavy tasks that over the years lead to the emergence of LBP, while those with a higher level of education are occupied as specialized staff and in administrative positions. Future investigations of the relationship between specific PA programs and the content and nature of the job and the appearance of LBP may give useful recommendations and lead towards the creation of new specialized and appropriate PA programs for specific populations.

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## **SOCIODEMOGRAFSKI FAKTORI I BOL U DONJEM DELU LEĀA UČESNIKA ŽENSKOG POLA U OPŠTINSKIM PROGRAMIMA FIZIČKE AKTIVNOSTI**

*Cilj ovog istraživanja bio je da se istraži povezanost bola u donjem delu leđa (LBP) sa faktorima nivoa obrazovanja i godina rada 131 žene, starosti 42±1.10 godina, koje su učestvovala u fizičkim aktivnostima u okviru opštinskih programa „Sport za sve“ u Grčkoj. Da li i kako PA utiče na intenzitet boli korišćeni su upitnik o ocenjivanju težine hroničnog bola-GSCP i Upitnik u vezi sa izbegavanjem usled straha-FABQ. Upotrebljeni su Analiza varijanse i Tuckey post-hoc kako bi se utvrdila razlika među pitanjima svakog od upitnika. Statistički značajne razlike utvrđene su u tri pitanja. Učesnice sa srednjim ili niskim nivoom obrazovanja pokazuju manje ili nikakvo poboljšanje LBP-a. Što se tiče godina rada, učesnici sa manje godina rada trpe više nivoa bola u donjem delu leđa od onih koji već rade duži vremenski period. Neophodna su buduća istraživanja odnosa određenih programa PA, sadržaja i prirode posla i pojave LBP-a.*

**Ključne reči:** bol u donjem delu leđa, intenzitet, radno iskustvo, nivo obrazovanja