

Prevalence of Low Back Pain and Assess Fatigue Level in Athletes, Sedentary Population, and Computer Operators: A Cross-Sectional Study.

Umesh Kumar Maurya, Komal Kumari, Digvijay Sharma.

Abstract

Background:

Low back pain (LBP) is a common musculoskeletal condition that affects individuals across various populations, including athletes, sedentary individuals, and computer operators which leads to rising prevalence of LBP.

Aim:

The aim of this study was to evaluate the prevalence of low back pain in different population (Athletes, sedentary, computer operators) in both males and females and also to assess their fear-avoidance belief due to pain.

Materials and Methods:

A cross-sectional study of total 900 participants (male and female) consist of athletes mean age (20-40) included hockey(H), football(F), weightlifters(W), computer operator (C) and sedentary (S) population mean age (20-40) were recruited from the CSJM University and Green Park stadium, Kanpur, India. We included those who experienced LBP from past 2 years. An established validated questionnaires like Japanese Orthopaedic Association back pain evaluation questionnaire (JOABEQ), Oswestry Low Back Pain Disability Questionnaire (OSW), Fear-avoidance belief questionnaire (FABQ) and Checklist individual strength (CTS-20) were used in this study.

Results:

LBP was prevalent among athletes, computer operator, sedentary population from India. ANOVA test was used to analyses the data. In JOA prevalence of pain higher in sedentary population as compared to hockey players (p value <0.001). OSW and CIS showed more cases of LBP in Weightlifters among all (p value <0.001). Prevalence of high avoidance in physical and work-related activity showed higher in Weightlifters (p value <0.001) than rest of three population.

Conclusions: The findings showed that high prevalence of LBP in sedentary population and hockey players was due to their daily life activities and also their change in life style along with decrease in fitness level. This indicates that weightlifters, despite being physically active, might be at higher risk for LBP, possibly due to the high physical demands and strain from lifting heavy weights.

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Introduction

The World Health Organization (WHO) advises all nations to create national policies and physical activity goals that help people reach appropriate levels of physical activity [1]. The most prevalent orthopedic issue globally is low back pain (LBP), which can impact both younger and older persons [2]. Prevalence of Adolescent LBP in sports like football, gymnastics, wrestling, rowing, and diving, which strain the lumbar spine. In contrast, sports like swimming, which put less strain on the spine, are less likely to cause LBP[3]. LBP is commonly characterized by pain, muscle stiffness, or tension in the area below the ribs and above the buttocks, which may or may not include leg pain (sciatica) [4]. LBP is a common ailment among working adults, and its incidence tends to increase with age. A recent study indicated that the global prevalence of LBP at a specific point, which restricts daily activities, is 7.3%, positioning LBP as a primary cause of disability worldwide[5]. With a lifetime incidence of up to 80% and an estimated yearly prevalence of 15% to 20%, LBP has long been identified as an issue affecting nearly all adults [6]. Young elite athletes had a 3–5 times higher prevalence of LBP than the standard age-related population [7]. Lifetime prevalence of LBP can reach up to 1-58% [8]. Research shows Occupational factors like heavy lifting, frequent bending, twisting, and involvement in extreme sports are well-established risk factors for LBP [9-11]. Fatigue is an important issue in both the general population and among patients in primary healthcare, where it is a widely prevalent non-specific symptoms [12]. Fatigue is the decline in muscle force capacity during

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Keywords

Low back pain, Fatigue, Disability, Fear-avoidance belief

prolonged exercise e, often due to depletion of liver and muscle glycogen. Endurance sports, athletes commonly refer to this experience as "bonking" or "hitting the wall." [13]. The present study was throwing light upon the relationship between and assess the level of fatigue and associated risk factors for an injury to occur in athletes & if there is any specific sport in which LBP is most common, it may also help to provide effective methods for prevention of associated Contributing factors of LBP.

Materials & Methods

Study Design: This cross-sectional study included 900 participants (300 each from athletes, computer operators, and sedentary populations). The JOABEQ, OSW, FABQ, and CTS-20 questionnaires were used to assess fatigue levels and LBP prevalence. Participants, aged 20-40, had LBP for 2 years, with an equal gender distribution (50% male, 50% female). Results were based on the analysis of 900 completed questionnaires.

Participants: The study included athletes (hockey, football, weightlifting), computer operators, and sedentary individuals aged 20-40 (athletes) and 20-40 (others) with LBP for at least 2 years. Excluded were those under 18, over 40 (for non-athletes), or with systemic illnesses. Consent from all participants was duly acquired.

Outcome variables: The JOA Back Pain Evaluation Questionnaire has 25 questions, calculating 5 functional scores (0-100), with higher scores indicating better condition [14]. The OSW has 10 items (scored 0-5), with a higher score showing more disability, multiplied by 2 for a percentage [15]. The FABQ, developed by Waddell, assesses fear-avoidance beliefs in LBP patients to identify those needing psychosocial support [16]. The CIS-20 measures fatigue with 20 statements rated on a 7-point scale, based on the past 2 weeks [17].

Statistical analysis: The data collected was analyzed using the IBM SPSS Statistics software, version 26. The analysis of variance (ANOVA) test was applied to compare the prevalence of LBP between males and females. Statistical significance was determined when the p-value was less than or equal to 0.05.

Results

The data shows that JOA1 prevalence of LBP is highest in the sedentary population and lowest in weight lifters. JOA2 lumbar function disability is highest in hockey players and lowest in football players. JOA3 walking ability is highest in the sedentary group, followed by hockey players. JOA4 social life function is highest in the sedentary population, followed by hockey players, football players, and computer operators. JOA5 mental health is ranked highest in hockey, followed by sedentary and football populations, with weight lifters having the lowest scores ($P < 0.001$) (Table 1).

The data shows that in CIS1, weight lifters report the highest fatigue levels, with hockey players having the least ($P < 0.001$). In CIS2, weight lifters have the most concentration issues, while football players have the least. CIS3 shows football players with the highest levels, and weight lifters with the least ($P < 0.001$). In

CIS4, weight lifters report the highest physical activity level, followed by football players with lower activity levels ($P > 0.275$) (Table 2).

An OSW shows prevalence of LBP in Weight lifters is highest among all followed by little difference of prevalence in Football players. Computer operators occupied prevalence of LBP at followed by Hockey players. Least value shows the prevalence of LBP for Sedentary population (P value < 0.001) (Table 3).

The data shows that FABP indicates the highest physical activity avoidance in weight lifters, followed by computer operators, football players, and sedentary individuals, with the least in hockey players. FABW reveals that work-related avoidance is highest in weight lifters, followed by football players and computer operators, with similar results for both groups. Hockey

Table 1: All the data of Japanese Orthopedic Association back pain evaluation questionnaire (JOABEQ).T

P Value	F test	Std. Deviation	Mean	ANOVA	
<0.001	6.25	25.678	35.16	H	JOA1
		22.717	30.48	W	
		29.621	34.11	F	
		31.807	43.23	S	
		26.093	33.95	C	
0.041	2.49	27.603	49.8	H	JOA2
		26.911	42.68	W	
		28.135	37.98	F	
		26.572	42.3	S	
		28.805	41.56	C	
<0.001	12.11	30.133	60.3	H	JOA3
		30.93	49.58	W	
		31.84	45.96	F	
		29.344	65.15	S	
		31.501	52.15	C	
		23.019	50.96	H	

Table 2: All the data of Checklist individual strength (CTS-20)

ANOVA	CIS 1					CIS 2					CIS3					CIS4				
	H	W	F	S	C	H	W	F	S	C	H	W	F	S	C	H	W	F	S	C
Mean	28.77	38.10	31.21	29.38	32.23	14.97	20.04	14.50	16.28	17.39	13.00	12.49	14.55	14.04	13.23	10.88	11.12	9.93	10.26	10.81
Std. Deviation	12.328	10.533	12.587	10.361	11.932	7.762	5.495	7.909	6.371	7.255	6.299	4.366	6.860	5.946	5.730	5.677	4.043	5.527	4.837	4.944
F test	12.727					10.888					2.510					1.283				
P Value	<0.001					<0.001					0.041					0.275				

Table 3: All the data of Oswestry Low Back Pain Disability Questionnaire (OSW).

ANOVA	H	W	F	S	C
Mean	34.24	40.57	39.33	27.23	36.74
Std. Deviation	16.293	13.538	18.062	14.626	16.464
F test	23.398				
P Value	<0.001				

Table 4: All the data of Fear-avoidance belief questionnaire (FABQ)

ANOVA	FABP					FABW				
	H	W	F	S	C	H	W	F	S	C
Mean	15.04	18.22	16.07	15.22	16.29	22.64	27.23	24.76	20.08	24.63
Std. Deviation	6.179	4.587	4.142	4.896	5.243	7.062	7.317	7.704	6.730	7.750
F test	7.753					25.515				
P Value	<0.001					<0.001				

CIS2, weight lifters have the most concentration issues, while football players have the least. CIS3 shows football players with the highest levels, and weight lifters with the least ($P < 0.001$). In CIS4, weight lifters report the highest physical activity level, followed by football players with lower activity levels ($P > 0.275$) (Table 2).

An OSW shows prevalence of LBP in Weight lifters is highest among all followed by little difference of prevalence in Football players. Computer operators occupied prevalence of LBP at followed by Hockey players. Least value shows the prevalence of LBP for Sedentary population (P value < 0.001) (Table 3).

The data shows that FABP indicates the highest physical activity avoidance in weight lifters, followed by computer operators, football players, and sedentary individuals, with the least in hockey players. FABW reveals that work-related avoidance is highest in weight lifters, followed by football players and computer operators, with similar results for both groups. Hockey players have the least prevalence, and sedentary individuals fall in between ($P < 0.001$) (Table 4).

Discussion

The key finding of this study is that the occurrence of LBP and assess the level of fatigue in athletes, sedentary population, computer operators and their associated risk factors. The current study showed the different level of prevalence of LBP, among the given population. This data is calculated on basis of different questionnaire filled by the total population and results were according to the sub-parts of the questionnaire. JOA scale shows that there is high prevalence of LBP in sedentary population followed by hockey players. Least value came out for the weight lifters but according to previous

study Sedentary individuals and computer operators scored significantly higher on the JOA ($p < 0.01$). The authors declare that they have no conflicts of interest. previous literature shows comparing the prevalence of LBP between male (83%) and female (67%) football and hockey players reports no significant difference but in others LBP in young elite athletes is observed to be 3 to 5 times more common than in the general population of the same age group. Risk factors for LBP related to sports were observed in field hockey and speed skating.[7].LBP causes more globally disability than other condition.[16] As considered to past study the postures associated with field hockey do not seem to significantly contribute to the increase in LBP incidence. [18].FABQ showed that there was high prevalence of avoidance in Physical activity and work-related avoidance in Weight lifters but in previous article shows that higher in work related avoidance and no differences in physical exercise. A p-value smaller than 0.05 was considered to indicate statistical significance.[19], People with elevated fear-avoidance had 2.27 times greater chances of experiencing prolonged pain duration. ($p = 0.0001$) [20], Oswestry ($p < 0.05$) questionnaires, indicating higher levels of disability due to LBP compared to athletes in behalf of recent study the prevalence of LBP is higher in weightlifters than others (P value < 0.001), The study revealed that ice hockey players have the highest prevalence of lower back pain (60.1%) compared to other groups[21]. Increased subjective fatigue was reported in Weight lifters and other groups. Higher scores reflect increased fatigue, greater difficulty with concentration, lower motivation, and reduced physical activity. Limitation of this study considered as larger sample size are needed to validate, categorized the demographic information like Stature, weight, and body mass index (BMI) in male and females according to their age.

Conclusion

This study concludes that high widespread nature of back pain in sedentary population, weightlifters existed due to their daily life activities and also their change in life style, despite being physically active, may face a higher risk of LBP due to the intense physical demands and strain associated with lifting heavy weights. All four-questionnaire showed that result is significant for all three populations. To overcome this problem of low back pain strengthening exercises at regular interval and for sedentary population mobility exercises and walking should be recommended, for others suggests that individuals engaged in sports may be susceptible to LBP if their training or activity places excessive stress on the back, underlining the importance of balanced exercise routines, proper technique, and sufficient recovery to minimize the risk of injury.

Abbreviations LBP: low back pain; WAD: walking ability dysfunction; SLD: Social life dysfunction; LFD: lumbar function disability; JOABEQ: Japanese Orthopedic Association back pain evaluation questionnaire; FABQ: Fear-avoidance belief questionnaire; CTS-20: Checklist individual strength

Conflict of interest

The authors declare that they have no conflicts of interest.

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