



## Original Article

## Demographic Association of Low Back Pain; A Case Control Study

Samia Khalid Khokhar<sup>1\*</sup>, Aisha Qamar<sup>1</sup>, Ambreen Surti<sup>1</sup>, Muhammad Faisal Fahim<sup>2</sup> and Yasmeen Mahar<sup>1</sup><sup>1</sup>Department of Anatomy, Bahria University Health Sciences Campus, Karachi, Pakistan<sup>2</sup>Department of Physical Therapy, Bahria University Health Sciences Campus, Karachi, Pakistan

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## \*Corresponding Author:

Samia Khalid Khokhar  
Department of Anatomy, Bahria University Health Sciences Campus, Karachi, Pakistan  
[dr.samia\\_khalid@hotmail.com](mailto:dr.samia_khalid@hotmail.com)

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## ABSTRACT

Low back pain is a condition of prime concern by World Health Organization. It affects the quality of life and execution of work at jobs worldwide. Among these 90% cases are categorized as non-specific low back pain. **Objectives:** To evaluate demographic characteristics of cases of low back pain (LBP). To compare the BMI between cases and control groups in relation to low back pain. **Methods:** This case control study was undertaken on 178 subjects, comprising of equal number of cases of LBP and healthy controls with age ranging from 18-65 year, enrolled by non-probability convenience sampling at PNS Shifa Hospital, Karachi after obtaining ethical approval from ERC of BUHSC. Demographic parameters like gender, age, marital status, and occupation were noted on pre-designed proforma and compared between cases and controls. Body mass index (BMI) was also compared between the groups. **Results:** The study showed LBP as more common in women, with significant association with marital status, occupation and BMI. The participants were divided into 5 groups according to age, maximum 29.8%, participants were in age group 36-45 years followed by 24.7% in 26-30 years, 20.2% in 46-55 years, 16.95 in 18-25 years and only 8.4% in 56-65 years. Most of the cases were housewives followed by office workers. A highly significant result was seen when BMI was compared between cases and control as most of the cases (41.6%) were overweight as compared to controls. **Conclusion:** The incidence of LBP was more among women, married, housewives and overweight subjects.

## INTRODUCTION

Low back pain (LBP) is a comprehensive term including a substantial number of conditions. It can be defined as pain taking place between 12th rib and gluteal folds, which is usually accompanied by discomfort and/or stiffness [1]. The pain can be regarded either specific or non-specific, depending on the factors causing it. The specific causes of LBP include pathology, like infection, fracture, rheumatoid arthritis, osteoporosis, or tumor, while non-specific LBP is not due to an identifiable or distinctive pathology [2]. Up to 80% of individuals can be affected and about 90% cases are due to nonspecific LBP. Current epidemiological data revealed that annual global incidence of this condition is 245.9 million with a prevalence of 577 million and disability-adjust life years (DALYs) accounting for 64.9 million [3]. Low back pain is recognized by World Health Organization as a condition of prime concern, as this health problem

affects quality of life and execution of work at jobs throughout the world. The socioeconomic effect of the disease highlighted the importance of effective and time treatment to upgrade the quality of life, enhancing return to work [4]. Backache has been one of the major causes of disability in our population as well [5]. It has been determined that 40.65% of the Pakistani population over the age of 50 years suffers from low back pain. Its prevalence is 2.5 times higher among women who seldom perform moderate physical activity in their daily routine. Local data also revealed that obesity, prolonged desk jobs, lack of health awareness and exercise, psychological disorders and heavy weight bearing jobs are more commonly associated with LBP in Pakistani population as compared to the general population. Its prevalence is also more in urban than in rural areas [6]. With this background,

the current study was planned to observe the demographic association in cases of low back pain and to compare them with healthy individuals in our area.

## METHODS

A total of 178 subjects (89 in each group) were recruited for this case control study. After approval of the study from ethics committee of Bahria University Health Sciences Campus, Karachi, this study was conducted at the rehabilitation department of PNS Shifa Hospital, Karachi. Male and female patients within the age bracket of 18-65 years who were diagnosed with acute and chronic lower back pain were made part of the cases while subjects visiting the outpatient department with complaints other than low back pain were placed in the control group. However, patients with any type of trauma, ankylosing spondylitis, arthritis (rheumatoid and osteoarthritis), fracture of sacral spine, skeletal hyperostosis and pregnancy were excluded from the study. Demographic parameters like age, gender, height, weight, body mass index (BMI) and occupation were noted on pre- designed proforma. Data were analyzed using SPSS version 23.0. Means and standard deviations were expressed for quantitative variables like age and BMI, while qualitative variables were expressed as frequency. T-test was used to compare the height and weight in cases, while Chi square test were used to see to the association of marital status and gender in cases. Fischer's exact test was applied to compare BMI and occupation between cases and controls. A p-value ≤0.05 was considered as statistically significant.

## RESULTS

One hundred and seventy-eight study participants were divided equally into cases and controls. 75 were males while 103 were females as shown in table 1. The participants were divided into 5 groups according to age (years) (18 -25, 26 -35, 36 -45, 46 -55 & 56 -65). Maximum (29.8%) participants were in age group 36-45-year, followed by 24.7% in 26-30-year (table 1).

Gender	Frequency (%)
Male	75 (42.1%)
Female	103 (57.9%)
Marital Status	Frequency (%)
Married	147 (82.6%)
Single	31 (17.4%)
Age	Frequency (%)
18-25	30 (16.9%)
26-35	44 (24.7%)
36-45	53 (29.8%)
46-55	36 (20.2%)
56-65	15 (8.4%)
Occupation	Frequency (%)
Retired	4 (2.2%)

Manual laborer	1 (0.6%)
Office worker	57 (32%)
Student	6 (3.4%)
Housewife	80 (44.9%)
Self employed	2 (1.1%)
Field work	21 (11.8%)
Other	7 (3.9%)
Group	Frequency (%)
Case	89 (50%)
Control	89 (50%)
Low Back Pain	Frequency (%)
Yes	89 (50%)
No	89 (50%)

**Table 1:** Demographic features of Study Participants (n=178)

Chi-square test was applied and association between marital status between cases and controls was found to be significant with a p-value of 0.003 (table 2). 91% cases were married while only 9% cases were single. Out of 89 controls, it was observed that 74.2% were married while 25.8% were single (table 1). The study showed significant results (p value = 0.003) on comparing the occupation with back pain in cases and controls (table 2) by applying Fischer's exact test. It was evident that most of the cases were housewives followed by office workers (table 2).

Marital Status	Case (n=89)	Control (n=89)	Total	p-value
Married	81	66	147	0.003*
	91.0%	74.2%	82.6%	
Single	8	23	31	0.003*
	9.0%	25.8%	17.4%	
Age (years)	Case (n=89)	Control (n=89)	Total	p-value
18-25	9	21	30	0.091
	10.1%	23.6%	16.9%	
26-35	25	19	44	0.091
	28.1%	21.3%	24.7%	
36-45	27	26	53	0.091
	30.3%	29.2%	29.8%	
46-55	22	14	36	0.091
	24.7%	15.7%	20.2%	
56-65	6	9	15	0.091
	6.7%	10.1%	8.4%	
Occupation	Case (n=89)	Control (n=89)	Total	p-value
Retired	0	4	4	0.003*
	0.0%	4.5%	2.2%	
Manual laborer	1	0	1	0.003*
	1.1%	0.0%	.6%	
Office worker	23	34	57	0.003*
	25.8%	38.2%	32.0%	
Student	0	6	6	0.003*
	0.0%	6.7%	3.4%	
Housewife	51	29	80	0.003*
	57.3%	32.6%	44.9%	
Self employed	2	0	2	0.003*

	2.2%	0.0%	1.1%
Field work	9	12	21
	10.1%	13.5%	11.8%
Other	3	4	7
	3.4%	4.5%	3.9%

**Table 2:** Comparison of Marital Status, Age and Occupation between Cases and Controls (n=178)

A highly significant result (p value = 0.000) was seen on applying Fischer's Exact test between BMI and back pain (table 3). Most of the cases (41.6%) were overweight as compared to controls. Thereby, establishing the fact that BMI plays a significant role in back pain.

BMI	Group		Total	p-value
	Control	Case		
Underweight (<18.5)	6	1	7	0.000*
	6.7%	1.1%	3.9%	
Normal (18.5-24.9)	77	32	109	
	86.5%	36.0%	61.2%	
Overweight (25-29.9)	6	37	43	
	6.7%	41.6%	24.2%	
Obese Class I (30-34.9)	0	15	15	
	0.0%	16.9%	8.4%	
Obese Class II (35-39.9)	0	1	1	
	0.0%	1.1%	.6%	
Obese Class III (>40)	0	3	3	
	0.0%	3.4%	1.7%	
Total	89	89	178	
	100.0%	100.0%	100.0%	

**Table 3:** Comparison of BMI between Cases and Controls (n=178)

## DISCUSSION

Low back pain is one of the most frequently experienced health problem which majority of people encounter at some point in their daily work life [7]. It is the second most frequent global public health problem, after headache in the categorization of painful disorders which affect human beings [2]. In the present study, demographic data of participants (gender, marital status, age, and occupation) was compared between cases of backache and healthy controls to perceive significance of difference in relation to low back pain. In this study, there were 42.1% males and 57.9% females out of total study participants. There were more cases of low back pain in women (62.9%) in comparison to men (37.1%). Muazzam et al., also observed that among 366 subjects, majority 266 (72.7%) were women, whereas 100 (27.3%) were men [8]. Chatterjee et al., found 57% of the cases of low back pain to be female [1]. Adhikari et al., and Sachdev et al., [9, 10] also found similar results. This difference is most likely due to conditions which are specific to women such as premenstrual syndrome and pregnancy. There is increased secretion of progesterone during pregnancy which leads to relaxation of ligaments between pelvic bones including vertebrae,

leading to enhanced incidence of low back pain. This may also be due to the increased pain sensitivity among women, and fluctuations of hormones with menstrual cycle. The physiological effects of pregnancy and childbirth as well as physical stress of upbringing children renders them more susceptible to LBP [11]. In disagreement to the current study, Zafar et al., found presence of low back pain more in males (51.7%) in comparison to females (48.3%) [12]. However, this difference between the gender was not statistically significant. Other studies also showed similar results [13]. In the present study, most (82.6%) study participants were married whereas few (17.4%) were unmarried. Also, a high percentage of the cases were married (91%) as compared to healthy controls (9.0%), which was statistically highly significant (p=0.003). Workneh et al., observed results similar to our study as 60.4% of the 285 participants in their study were married [7]. Similar findings were also observed by Ramdas et al., as they found that 90.8% low back pain cases were married whereas 9.2% were unmarried [14]. Contradictory results were observed by another study who observed higher proportion of single individuals (15,830) as compared to married ones (5,425) out of the total study population (21,255) [15]. In the present study, the participants (age ranging from 18-65 years) were divided into smaller groups according to the age for comparison between cases and controls. The highest numbers of cases (27; 30.3%) were noted in 36-45-year age group, followed by 26-35 year (25; 28.1%). However, statistically significant difference was not found in age between cases and controls (p=0.091). This was in agreement to Rasheed et al., who also observed 78.57% of cases of low back pain in the age group of 32-44 year, followed by age group of 18-31 years [16]. Another study also reported highest prevalence of back pain in ages 21-40 years (48%). It was observed a highly significant result when differences were assessed in occupation between cases of low back pain and healthy controls. Most of the cases were housewives (44.9%) followed by office workers (25.8%). Zafar et al., also depicted back pain most frequently among housewives (30%), followed by office workers (18.1%). This was most likely due to the exhausting routine of housewives in Pakistan, as they are expected to do physical jobs like washing clothes with hand, doing dishes, and cleaning their house, while care is not given to posture or comfort [12]. The office workers usually work in a fixed sitting position for prolonged hours while using a small number of muscles of the body, such as arms, forearms, wrists and hands, thus adopting a poor posture. This leads to greater chances of developing musculoskeletal disorders. The body adjusts to a non-neutral position which causes stress to the lumbar region and causes pain [13]. This might also be due to the reason

that muscles are unable to relax due to the continuous work and flow of blood may be reduced when they work in a fixed position further augmenting back pain [7]. The present study revealed a highly significant association between body mass index (BMI) when compared between cases of low back pain and healthy controls, as majority (41.6%) of the cases were included in the overweight category. In the control group, most participants (86.5%) had normal BMI. Peng et al., also reported high prevalence of low back pain in obese (36.4%) and overweight (29.6%) groups [17]. Similar results were determined by other studies [18, 19]. The findings of Najafi et al., were in disagreement to our results as they found no significant difference between the two groups [20]. It is most likely because obesity can increase mechanical load on spine leading to more compressive force on the lumbar vertebral column during different movements. Obesity can also initiate low back pain due to chronic inflammation, which is associated with raised acute-phase reactants and cytokines because of triggering of pro-inflammatory pathways resulting in pain [21]. The body mass index is regarded as measure of body weight status, the greater the weight, more pressure is exerted not only on the spine, but also intervertebral discs and related back structures to produce LBP [15].

## CONCLUSIONS

The present study provides an insight into the demographic data of the subjects suffering from low back pain. It revealed significant association of gender, marital status, occupation, and obesity with nonspecific low back pain. The results have demonstrated increased incidence of back pain in women, married individuals, housewives, followed by office workers and overweight participants in our society.

## Conflicts of Interest

The authors declare no conflict of interest.

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