

PREVALENCE ,DISABILITY AND MODIFIABLE RISK FACTORS OF CHRONIC LOW BACK PAIN AMONG GERIATRIC POPULATION WITH NONSPECIFIC LOW BACK PAIN

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ABSTRACT

Objective(s): The aim of this study was to calculate the prevalence of chronic low back pain, level of disability and modifiable risk factors among geriatric (≥ 60 years) with nonspecific LBP. A cross-sectional survey was conducted on 409 people with nonspecific low back pain in the District Gujrat, Pakistan. Participants were selected on the basis of inclusion and exclusion criteria by Non-probability convenient sampling technique from the general population Gujrat during August to November 2022. After taking a written consent, Data was collected. All data was analyzed with SPSS software version 24. Mean \pm SD was calculated for descriptive analysis. Frequencies and percentages were used in frequency table presentation of the qualitative data. All findings were estimated at a confidence interval of 95 per cent.

Results: Average age, height, weight and BMI was 62.01 ± 2.91 SD, 167.92 ± 10.51 SD, 73.99 ± 11.63 SD and 26.55 ± 5.2 SD respectively. Prevalence of chronic low back pain female gender and obesity was found to 59.1%, 69.2% and 61.61 respectively. Association of demographic data and pain duration was not found to be statistically significant with p value > 0.05 . Association of obesity as a risk factor with pain duration was found to be statistically significant < 0.05 . Disability was statistically significant to pain duration with p value < 0.05 .

Conclusion(s): The present study conclude high prevalence of chronic low back pain. Obesity is a modifiable risk factor for chronic low back pain. Disability is caused by chronic low back.

Keywords: chronic low back pain (CLBP), disability, modifiable risk factors

INTRODUCTION

Chronic low back pain is described as discomfort, tension, or stiffness below the costal margin and above the inferior gluteal folds that lasts for lengthier than 3 months.¹ The resultant chronic disabling back pain was defined as having experienced chronic back pain lasting for 3 months.² Low back pain is a symptom rather than an illness. It can have variety of causes, similarly to other symptoms, such as dizziness and headache. The most frequently occurring form of low back pain is non-specific low back pain. The phrase used when its impossible to

pinpoint the pathoanatomical source of the pain.¹ Non-specific LBP is the term used to describe LBP in 90% of cases where no clear etiology can be found. Since LBP is non-specific, investigations such as radiography and laboratory testing are not required, which delays diagnosis and results in inadequate therapy, which causes LBP to progress into chronic LBP. Low back pain (LBP) is today the leading contributor to disability and has a significant negative socioeconomic impact on society. Chronic low back pain (CLBP) is still poorly understood and regarded as a minor condition in low- and middle-income countries despite all of these challenges². Disability can be widely conceptualized as the space between the demands of the environment and person's capability. For all those who work with elderly patients experiencing chronic pain, this subject is crucial. Chronic pain limitations should be treated on an individual basis and should not be ignored as people age.³ Many modifiable risk factors for low back pain, including inactivity, poor health, obesity, smoking, alcohol misuse, and occupational factors such heavy lifting, awkward bending over, stooping, and extended sitting⁴. Additional risk factors include a history of back pain, job dissatisfaction, physically demanding employment, immobile work positions, lifting, vibration, obesity, and psychosocial factor⁵

Modified Oswerty low back pain disability scale is used as well keeping in mind the society and cultural changes of Pakistan with other societies instead of Oswerty low back pain disability scale to evaluate the low back pain disability. Numeric pain rating scale is used for the measurement of pain. Based on this background, the aims of this study were 1: to analyze the association between the Modifiable risk factors and chronic low back pain, 2: the prevalence of chronic low back pain and disability in population ≥ 60 years of age. There are so many factors that can be modifiable, this study will be helpful in evaluating the prevalence of these modifiable risk factors (heavy lifting, twisting, bending, smoking, lack of sleep etc.) that cause low back pain. This will be helpful in preventing some of those risk factors and modifying them in a better way, to improve the quality of life, avoid pain and disability in geriatric population. Handling LBP by health services and addressing the modifiable risk factors through health promotion programs will be an essential step in directing burden of illness imposed by LBP and other more serious morbidities suffered by community.

Material and methods:

Study design, duration and setting

This analytical cross-sectional study was conducted between August 2022 and November 2022. A sample of 409 people with nonspecific low back pain of age 60-70+ were selected from General population of Gujrat district of Pakistan who agreed to participate in the study.

Sampling technique and sample size calculation

Nonprobability convenient sampling technique was used. Sample size n=409 was calculated using below mentioned formula¹⁰ and WHO recommended calculator

$$n = (Z_{1-\alpha/2})^2 (p)(1-p)/(d)^2$$

$$n = (1.96)^2(0.41)(0.59) / (0.05)^2$$

$$n = 371 + 10\% \text{ dropout} = 409 \text{ total sample size}$$

Participants

People with nonspecific low back pain of age 60 -70+ were selected from General population. Exclusion criteria included people with Diagnosed specific pathologies of chronic back pain (e.g. : spinal canal stenosis, infection, malignancy, rheumatic and systematic inflammatory disorders) ,Cognitive impairment, Diagnosed disorders or diseases impairing sensation (e.g. substance abuse, neuropathy and inflammatory disease)³.Had no recent acute condition producing pain such as back surgery, traumatic back injuries. Had no previously diagnosed neurological disorders (stroke ,Parkinson)¹.

Ethical approval and Consent

Ethical approval was taken from Institutional Review Board (IRB) of University of Lahore, Punjab, Pakistan. An informed was taken from the participants before collecting data. Ensured that data would be used for only research purpose. The research project was approved by research and ethics committee of University of Lahore

- **Data collection procedure and tools**

The participants were interviewed face to face, informed consent was taken from all the participants.. Collected data comprised of demographics, pain severity, risk factor and disability scale collected by a semi-structured questionnaire (including demographic data, risk factor , modified Oswestry Low Back Pain Disability Questionnaire ⁶ , and Numeric Pain Rating Scale (NPRS) ^{7 8}) .

Demographics such as Age ,occupation, Weight (for calculating BMI) and gender .Height and weight were measured using measuring tape and weight machine respectively .Numeric pain rating scale (NPRS) was used to asses pain severity . In Numeric pain rating scale ,0 indicated no pain ,1-3 indicated mild

pain ,4-6 indicated moderate pain and 7-10 indicated severe pain .risk factors were calculated through a questionnaire including yes and no for each of the 14 risk factors .Disability was calculated through a questionnaire i.e. modified Oswerty disability index .It includes 0 questions based on daily life activities with 5 options for each question. Whereas, the last question ,question 10 had two parts based on choice , the part a was for people who travel frequently and part b was for weight lifters .

Statistical analysis:

Data was entered and analyzed using Statistical Package for Social Sciences (SPSS) software version 24. For descriptive analysis, mean and standard deviation was calculated for quantitative variables whereas frequencies and percentages were calculated for qualitative variables. For inferential statistics, Chi-square test was applied. All results were calculated at 95% confidence interval and p-value ≤ 0.05 was considered as significant value.

Results:

During this study period, 409 people with nonspecific low back pain of age 60 -70+ with mean age ,height ,weight and BMI was 62.01 ± 2.91 , 167.92 ± 10.51 , 73.99 ± 11.63 and 26.55 ± 5.2 SD respectively .With highest percentage of them were housewives 247(60.4%), in age 341(83.4%) group 60-64 years ,with moderate pain severity(4-6 moderate), 177(43.3%) BMI Pre-obese (25.0 to 29.9). Prevalence of Chronic low back pain(**fig 1**),Female gender and obesity was found to be 242(59.2), 283(69.2) and 252(61.6) respectively. Association of demographics with pain duration was not found to be statistically significant with p values >0.05 .Association of risk factors and pain duration was not found to be statistically significant >0.05 except the only risk factor obesity ,was found to be only significantly associated with pain duration with p value <0.05 . Association of disability with pain duration was found to be statistically significant with p vale <0.05 .

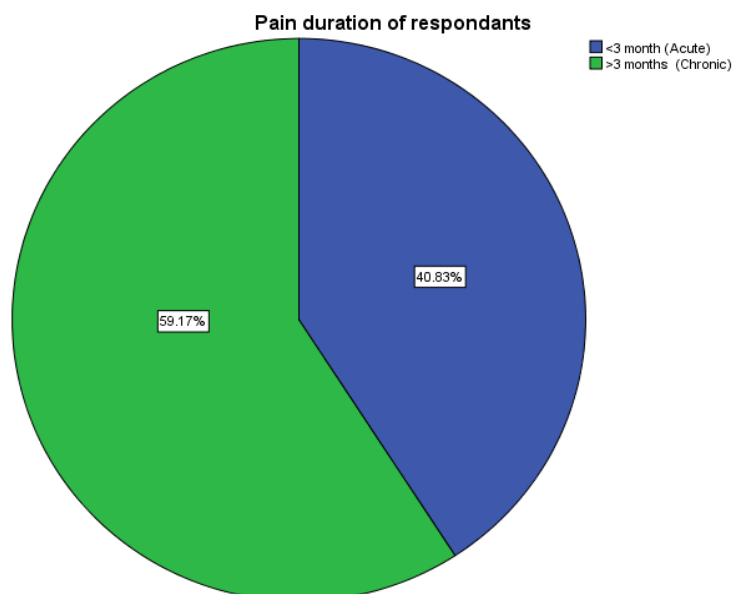


Figure 1: Prevalence of nonspecific chronic low back pain

Table 1: Descriptive analysis of participants

Demographics	Categories	n (%)	Mean \pm SD
Occupation of respondents	Housewife	247(60.4%)	
	Government employee	30(7.3%)	
	Businessman	10(2.4%)	
	Private job	57(13.9%)	
	Other job	65(15.9%)	
Age Groups of respondents (Years)	60-64	341(83.4%)	62.01 \pm 2.91
	65-69	47(11.5%)	
	70 plus	21(5.1%)	
Severity of pain of Respondents	1-3(Mild)	84(20.5%)	
	4-6(Moderate)	259(63.3%)	
	7-10(Severe)	66(16.1%)	
BMI(Kg /m ²)	Underweight (below18.5)	12(2.9%)	
	Normal (18.5 to 24.9)	144(35.2%)	
	Pre-obese (25.0 to 29.9)	177(43.3%)	
	Obesity class 1 (30.0 to 34.9)	73(17.8%)	
	Obesity class 2 (35.0 to 39.9)	3(7%)	
Height(cm)			167.92 \pm 10.51
Weight kg			73.99 \pm 11.63
Gender of respondents	Male	126(30.8)	
	Female	283(69.2)	
Obesity	Yes	252(61.6)	
	No	157(38.4)	
Pain duration	<3 month (Acute)	167(40.8)	
	>3 months (Chronic)	242(59.2)	
Total		409	

Table 2 :Association of demographic characteristics and Pain duration of respondents

Demographics		Pain duration of respondents		Total	Chi square	P value
		<3 month (Acute)	>3 months (Chronic)			
Occupation of respondents	Housewife	100(59.9%)	147(60.7%)	247(60.4%)	4.26	0.37
	Government employee	16(9.6%)	14(5.8%)	30(7.3%)		
	Businessman	2(1.2%)	8(3.3%)	10(2.4%)		
	Private job	21(12.6%)	36(14.9%)	57(13.9%)		
	Other job	28(16.8%)	37(15.3%)	65(15.9%)		
Age Groups of respondents (Years)	60-64	137(82.0%)	204(84.3%)	341(83.4%)	0.52	0.77
	65-69	20(12.0%)	27(11.2%)	47(11.5%)		
	70 plus	10(6.0%)	11(4.5%)	21(5.1%)		
Gender of respondents	Male	52(31.1%)	74(30.6%)	126(30.8%)	0.014	0.90
	Female	115(68.9%)	168(69.4%)	283(69.2%)		
BMI(Kg /m ²)	Underweight (below18.5)	5(3.0%)	7(2.9%)	12(2.9%)	4.25	0.37
	Normal (18.5 to 24.9)	68(40.7%)	76(31.4%)	144(35.2%)		
	Pre-obese (25.0 to 29.9)	68(40.7%)	109(45.0%)	177(43.3%)		
	Obesity class 1 (30.0 to 34.9)	25(15.0%)	48(19.8%)	73(17.8%)		
	Obesity class 2 (35.0 to 39.9)	1(0.6%)	2(0.8%)	3(0.7%)		
Total		167(100%)	242(100%)	409(100%)		

Table 3: Association of risk factors and pain duration

Risk Factors		Pain duration of respondents		Total	Chi - square	P value	Odds Ratio	95% Confidence Interval	
		<3 month (Acute)	>3 months (Chronic)					Lower	Upper
Smoking	Yes	47(28.1%)	62(25.6%)	109(26.7%)	0.32	0.57	1.14	0.73	1.77
	No	120(71.9%)	180(74.4%)	300(73.3%)					
Obesity	Yes	93(55.7%)	159(65.7%)	252(61.6%)	4.21	0.04	0.66	0.44	0.98
	No	74(44.3%)	83(34.3%)	157(38.4%)					
Regular physical activity	No	54(32.3%)	87(36.0%)	141(34.5%)	0.57	0.45	0.85	0.56	1.29
	Yes	113(67.7%)	155(64.0%)	268(65.5%)					
Prolong standing /walking /leanigforward withoutsupport*continuos for 5 or > hrs daily)	Yes	88(52.75%)	138(57.0%)	226(55.3%)	0.75	0.39	0.84	0.56	1.25
	No	79(47.3%)	104(43.0%)	183(44.7%)					
Prolong sitting(continous for 5 or > hours daily)	Yes	72(43.%)	108(44.6%)	180(44.0%)	0.09	0.76	0.94	0.63	1.39
	No	95(56.9%)	134(55.4%)	229(56.0%)					
Kneeling/squat(continue for 1 or>hrs daily)	Yes	30(18.0%)	48(19.8%)	78(19.1%)	0.22	0.64	0.88	0.53	1.47
	No	137(82.0%)	194(80.2%)	331(80.9)					
Driving (continue for 4 or > hours daily)	Yes	32(19.2%)	49(20.2%)	81(19.8%)	0.07	0.79	0.93	0.57	1.53
	No	135(80.8%)	193(79.8%)	328(80.2%)					
Manual handling of heavy weight(>5 kg)	Yes	62(37.1.%)	86(35.5%)	148(36.2%)	0.11	0.74	1.07	0.71	1.61
	No	105(62.9%)	156(64.5%)	261(63.8%)					
Sleeping material	Soft	114(68.3)	151(62.4%)	265(64.8%)	1.51	0.22	1.29	0.85	1.97
	Hard	53(31.7%)	91(37.6%)	144(35.2%)					
Often twist the waist during work	Yes	57(34.1%)	64(26.4%)	121(29.6%)	2.80	0.09	1.44	0.94	2.21
	No	110(65.9%)	178(73.6%)	288(70.4%)					
Often bend forward at the waist an extreme degree	Yes	63(37.7%)	86(35.5%)	149(36.4%)	0.20	0.65	1.09	0.73	1.65
	No	104(62.3%)	156(64.5%)	260(63.6%)					
Expose to significant trembling,vibration ,or impact	Yes	30(18.0%)	41(16.9%)	71(17.4%)	0.07	0.79	1.07	0.64	1.80
	No	137(82.0%)	201(83.1%)	338(82.6%)					
Work in narrow space	Yes	23(13.8%)	32(13.2%)	55(13.4%)	0.03	0.87	1.05	0.59	1.86
	No	144(86.2%)	210(86.8%)	354(86.6%)					
Sleeping disturbance	Yes	88(52.7%)	108(44.6%)	196(47.9%)	2.58	0.11	1.38	0.93	2.05
	No	79(47.3%)	134(55.4%)	213(52.1%)					
Total		167(100%)	242(100%)	409(100%)					

Table 4: Association of disability and pain duration

Scoring of disability scale	Pain duration of respondents		Total	Chi-square	P value
	<3 month (Acute)	>3 months (Chronic)			
0% to 20%: Minimal disability	50(29.9%)	35(14.5%)	85(20.8%)	14.87	0.005
21%-40%: Moderate disability	64(38.3%)	106(43.8%)	170(41.6%)		
41%-60%: Severe disability	48(28.7%)	90(37.2%)	38(33.7%)		
61%-80%: Crippled:	4(2.4%)	9(3.7%)	13(3.2%)		
81%100%: Completely disable	1(0.6%)	2(0.8%)	3(0.7%)		
Total	167(100%)	242(100%)	409(100%)		

Discussion:

The purpose of this analysis was to find the prevalence ,disability and modifiable risk factors of chronic low back pain among geriatric population with nonspecific low back pain. A sample of 409 geriatric population with age ≥ 60 years were selected in this study whom average age ,height ,weight and BMI was 62.01 ± 2.91 , 167.92 ± 10.51 , 73.99 ± 11.63 and 26.55 ± 5.2 SD respectively . These finding are found to be consistent with previous studies which assessed prevalence of chronic low back pain in different population^{9 10}.

Frequency of demographic characteristics of respondents . Out of 409 participants there were 247(60.4%) housewife ,30(7.3%) Government employee, 10(2.4%) Businessman ,57(13.9%) Private job and 65(15.9%) other .as in previous studies frequency of housewives was greater^{11 12}. 341(83.4%) belong to age group 60-64, 47(11.5%) to 65-69 and 21(5.1%) to 70 plus ,in a previous study there were more people in a younger age group then the older one .¹¹ Pain severity of respondents was mild 84(20.5%),moderate 259(63.3%) and severe66(16.1%).BMI of respondents was Underweight 12(2.9%), Normal 144(35.2%), Pre-obese 177(43.3%), Obesity class 1 73(17.8%) and Obesity class 2 3(7%).¹³

Frequency of demographic characteristics in which female gender was 283(69.2) and male were 126(30.8). coinciding with the previous studies ^{9,14-16}.Frequency of obesity was 252(61.6) and non obese was 157(38.4)

according to the previous studies there was greater prevalence of obese^{9,17}. Frequency of pain duration in <3 months (acute) was 167(40.8) and in >3 months (chronic) was 242(59.2).^{14,18,19} Demographic characteristics of patients (occupation, age, gender and BMI) were found to be not significantly associated with pain duration with p value >0.05. As discussed in previous studies that certain occupation, advancing age, female gender and Increasing BMI were significantly associated with pain duration.^{12,13,20-23} This study findings suggest that chronic low back pain is not associated with demographic characteristics. Most previous studies didn't specifically worked on either nonspecific chronic low back pain in a geriatric population. That could be a reason for not similar results. The risk factor obesity was recognized to be only significantly associated with pain duration with p value <0.05 (OR 0.66, CI 0.44-0.98). Thus this study supports the previous literature that obesity is associated with Chronic low back pain as discussed before^{9,14,18,24-27}

The association of risk factors smoking, regular physical activity, prolong standing /walking /leaning forward without support (continuous for 5 or more hours daily), Prolong sitting (continuous for 5 or more hours daily), Kneeling /squat (continuous for 1 or more hours daily), Driving (continuous for or more hours daily), Manual handling of heavy weight (5kg or more daily), sleeping material, often twist the waist an extreme degree, often bend forward at waist an extreme degree, expose to significant trembling /vibration/or impact, work in narrow space and sleep disturbance with pain duration was not found to be statistically significant with pain duration with p value >0.05. This study does not support the previous literature that discuss the significant association of these risk factor with low back pain^{24,26,28-30}. It is because previous studies didn't choose the geriatric population with nonspecific chronic low back pain, thus the results vary. Association of disability with pain duration was reported to be statistically significant with p value <0.05. According to this study chronic low back pain is directly proportional to the disability score, as moderate to severe disability was found the highest in population with chronic low back pain. The results of this study suggest that Eighty-five participants had an MODI score of minimal disability (0%- 20%) ,35(14.5%) had CLBP. Moderate disability (21% -40%) 170(41.6%), 106(43.8%) had CLBP. Severe disability (41%-60%) 138(33.7%), 90(37.2%) had CLBP. Crippled (61%-80%: -40%) 13(3.2%), 9(3.7%) had CLBP. 3(0.7%) were 81%-100% Completely disable, 2(0.8%) had Chronic low back pain (CLBP).

CONCLUSIONS

The present study conclude that there was high prevalence of chronic low back pain in geriatric population. There was less significant association between pain duration of LBP and modifiable risk factors. Obesity was found to be only significantly associated. According to demographic data Advancing age, female gender and being housewife was also not found associated with low back pain. Disability was found to be statistically significant with pain duration, P value <0.05

Conflict of Interest: The authors declare that there is no conflict of interest regarding this study.

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