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Correlation between Lower Back Pain with Psychological Distress in Tertiary Care Centre

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Abstract: ***This cross-sectional study investigates the correlation between lower back pain and psychological distress. Despite common assumptions, our findings reveal no significant statistical correlation between these two factors, aligning with previous studies such as Alturkistani et al. Study design: Cross sectional study. Purpose: Consider 2 patients of the same age, same pathology seen on MRI but different tolerance to lower back pain. Both these patients have different effect on similar management and it would be interesting to know was whether there is a psychological component related with pain. Low back pain (LBP) is so common around the world that almost everyone will have at least one episode during their lifetime. It is defined as pain and discomfort between the costal margin and inferior gluteal folds with or without leg pain. Movement aggravates mechanical pain, which is eased by rest. Significance: This study contributes to the ongoing debate about the relationship between physical and psychological health, specifically in the context of lower back pain, a common health issue worldwide.***

Keywords: psychology, lower back pain, disability, chronicity, depression, anxiety, stress

1. Introduction

Low back pain (LBP) is so prevalent globally that most people will experience at least one episode of it over their lifetime.[1] The 1-year incidence of first-ever LBP has been estimated to be between 6.3 and 15.4%, and the 1-year incidence of any episode of LBP range from 1.5 to 36%.[2] Most individuals experience neck and/or low back pain at least once in their life, and with increasing age, a greater number of patients with such symptoms are seen by family physicians and in outpatient clinics. The first incidence of LBP occurs most frequently in the third decade of life and prevalence increases until 65 years, whereupon the rate decreases.[2] It is the leading cause of occupational disability worldwide. It is defined as pain and discomfort between the costal margin and inferior gluteal folds with or without leg pain. Mechanical pain is aggravated with movement and relieved by rest. Pain is described as dull, aching and similar to toothache and does not radiate down the leg. LBP may be episodic, characterized by remissions and relapses with periodic flares. [2] Pain may be acute (less than 6 weeks' duration), subacute (6−12 weeks) and chronic (more than 12 weeks). [3] Prevalence of lower back pain is maximum in the 55-64 age group and more common in women than men. Also, it is the second most common complaint for which patients visit a primary care doctor's office. [2-4] Psychological research has revealed that a great deal of pain is related to emotional stress.[4] Psychosocial factors play a crucial role in the aetiology of musculoskeletal pain. These factors include low educational status, stress, depression, anxiety, dissatisfaction with a job or work situation, and poor social support.[4] Recently, post-traumatic stress disorder (PTSD) was associated with incident chronic LBP.[5]

Causes of lower back pain:

Mechanical (80%)	• Muscular strains or from ligamentous injury
	• Degenerative disc disease
	• Facet joint disease (facet joint dysfunction)
	• Spondylolysis
	• Osteoporotic compression fractures
	• Instability
	• Sacroiliac joint pathology
Neurogenic (15%)	• Herniated disc
	• Spinal stenosis
	• Foraminal stenosis
	• Disc annular tear and neuritis
Non-mechanical back pain (1-2%)	• Infections
	• Neoplasms
	• Inflammatory conditions

2. Materials and Methods

Study description

Study design: Single centre ,cross-sectional study

Sample size: Sample size calculation. In a study by Ganesan et al (Asian Spine J. 2017 Aug; 11(4): 610–617), the prevalence was calculated to be 42.4%. Using this data, sample size was calculated as follows, Using formula for sample size calculation for prevalence studies, Sample size = 4pq /d2 Where, p = prevalence from previous study, q=1-p, d = precision error. Assuming p = 0.424 (42.4%), q=1-p = 1-0.424 = 0.576, d = 0.1 (10%) Sample size = 4 x 0.424 x 0.576 / 0.1 x 0.1 = 97.68 = 100 (rounded off) Thus, for the study we will need to enrol at least 100 patients.

Study period: 1 year

Inclusion criteria:

1) Patient coming to Outpatient Department of tertiary care centre hospital in the study period.
2) Patient aged 18 years to 65 years old, irrespective gender
3) Patients having chronic low back pain(pain persisting for more 12 weeks and present between last rib and gluteal fold)
4) Patients with no radicular pain

Exclusion criteria:

Patient with

1) Acute lower back pain
2) Traumatic aetiology
3) Neurological deficit
4) Bowel bladder involvement
5) Past history of psychiatric illness and psychiatric treatment for psychological ailment

Study Procedure

1) Patient fulfilling the inclusion criterion of the study will be enrolled.
2) Demographic data of the patient including Name, Age, Sex and duration of lower back pain of patient coming to Outpatient department of tertiary care Centre will be collected.
3) Patient will be asked to fill the questionnaire after taking proper informed consent.

Table 1: Questionnaire

Lower back Pain	Psychological distress
Oswestry Lower back pain questionnaire	Perceived stress scale
Roland Morris questionnaire	K10 (Kessler score)
Back pain functional score	Depression Anxiety stress scale

4) Statistical correlation between low back pain and psychological distress will be studied. This correlation will be done by Spearman's rank coefficient test

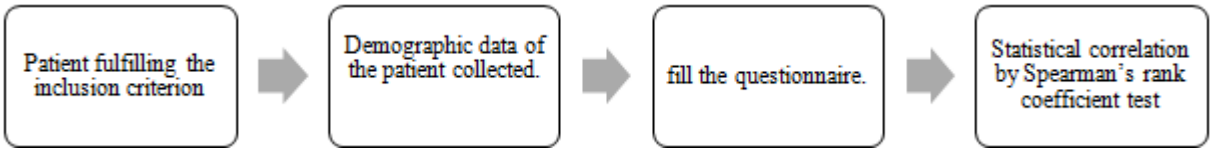


Figure 1: Study Procedure

3. Result and Discussion

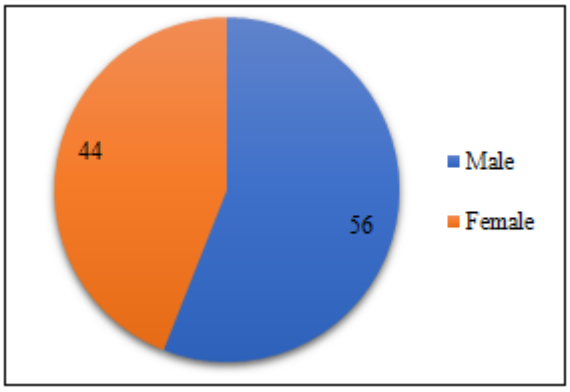
The data entry will be done with the help of Microsoft Excel 2010. Data will be analysed using SPS version 21. Data was entered into Microsoft Excel (Windows 7; Version 2007) and analyses were done using the Statistical Package for Social Sciences (SPSS) for Windows software (version 22.0; SPSS Inc, Chicago). Descriptive statistics such as mean and standard deviation (SD) for continuous variables, frequencies and percentages were calculated for categorical Variables were determined. Association between Variables was analyzed by using Chi-Square test for categorical Variables. Unpaired t Test and ANOVA (Analysis of Variance) were used to compare mean of quantitative variables between variables having 2 and more than 2 categories respectively. Bar charts and Pie charts were used for visual representation of the analyzed data. Level of significance was set at 0.05.

Demographic Distribution

100 patients who fulfilled our inclusion criteria and not failing the exclusion criteria, were included in the study. Distribution was done based on gender, age, occupation, education, socioeconomic status, family income, duration of lower back pain and VAS score.

Table 2: Distribution of Study Subjects according to the Gender (N = 100)

Gender	No.	Percent
Male	56	56.0
Female	44	44.0



Graph 2: Distribution of Gender

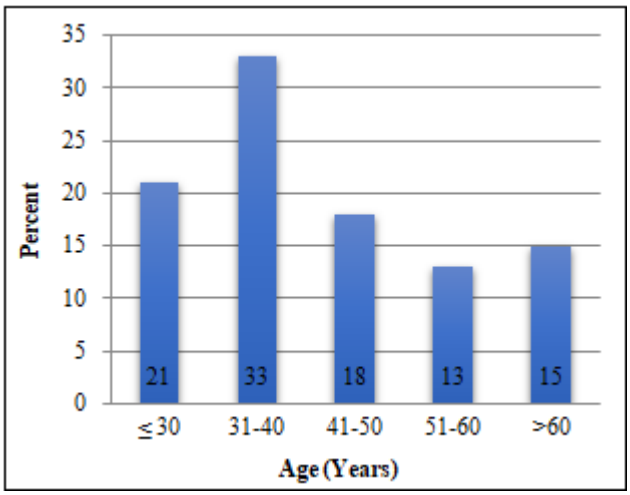
Age of the patients included in the study ranged from 18 years to 65 years.

Table 3: Distribution of Study Subjects according to the Age (N=100)

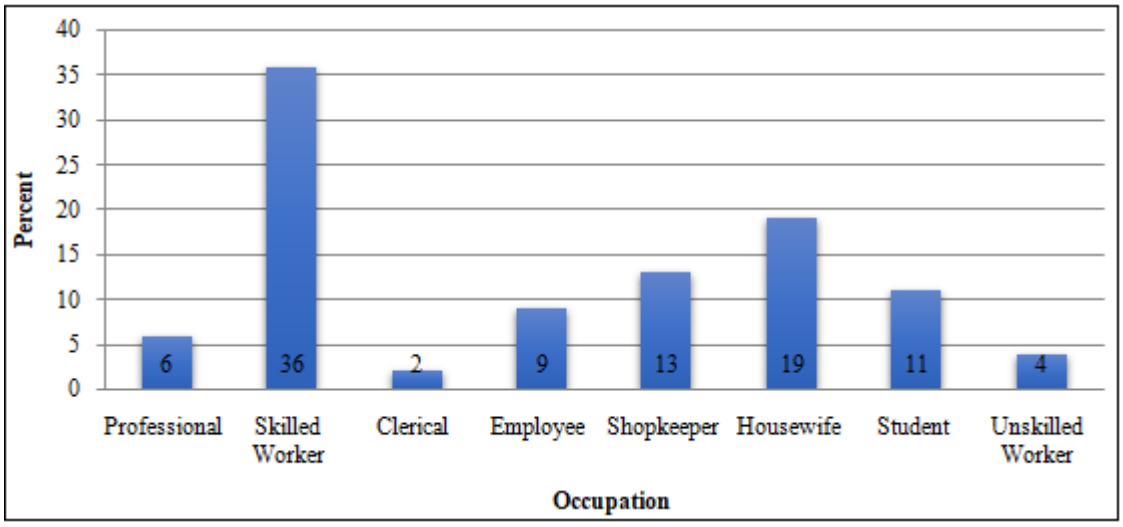
Age (Years)	No.	Percent
≤ 30	21	21.0
31-40	33	33.0
41-50	18	18.0
51-60	13	13.0
>60	15	15.0
Mean (SD)	42.11 (13.63)	
Range	15-65	

Table 4: Distribution of Study Subjects according to the Occupation (N=100)

Occupation	No.	Percent
Professional	6	6.0
Skilled Worker	36	36.0
Clerical	2	2.0
Employee	9	9.0
Shopkeeper	13	13.0
Housewife	19	19.0
Student	11	11.0
Unskilled Worker	4	4.0



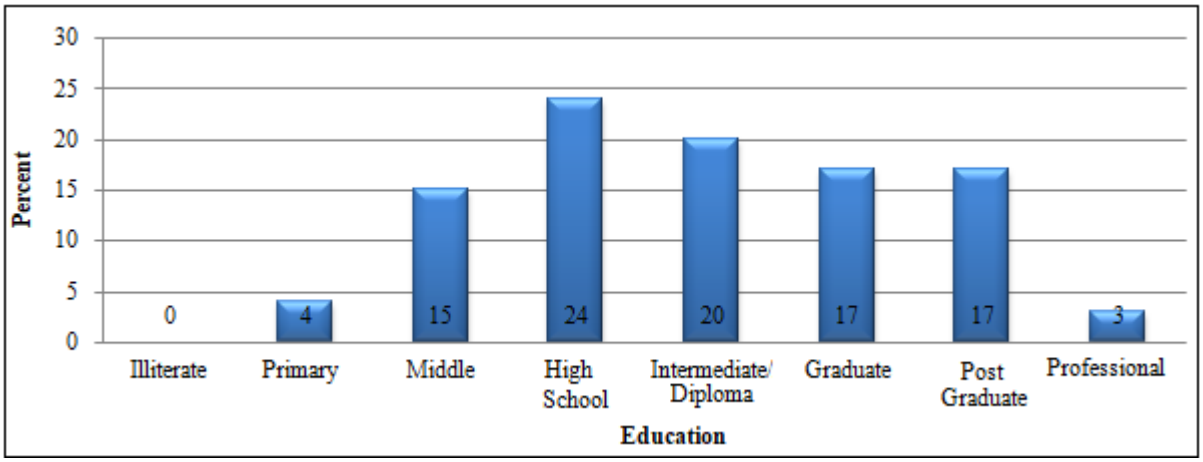
Graph 3: Distribution of Age



Graph 4: Distribution of Occupation

Table 5: Distribution of Study Subjects according to the Education (N=100)

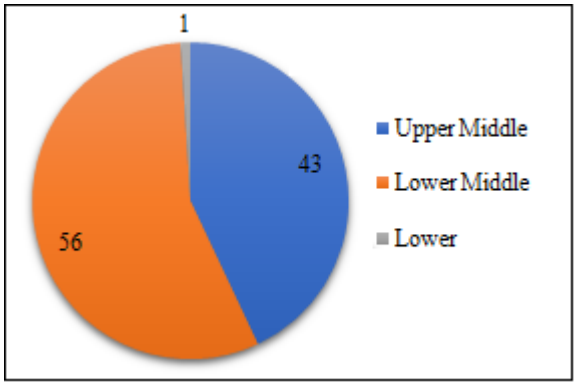
Education	No.	Percent
Illiterate	0	0.0
Primary	4	4.0
Middle	15	15.0
High School	24	24.0
Intermediate/Diploma	20	20.0
Graduate	17	17.0
Post Graduate	17	17.0
Professional	3	3.0



Graph 5: Distribution of Education

Table 6: Distribution of Study Subjects according to the SES (N=100)

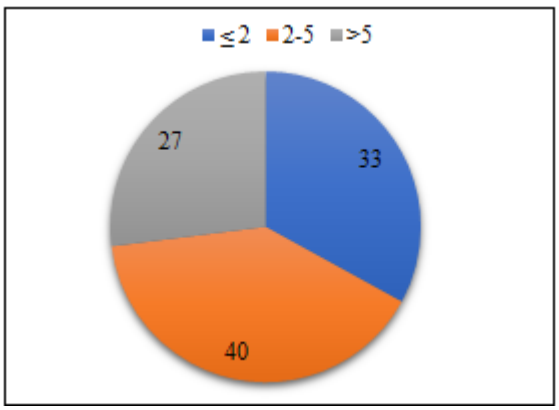
SES	No.	Percent
Upper Middle	43	43.0
Lower Middle	56	56.0
Lower	1	1.0



Graph 6: Distribution of SES

Table 7: Distribution of Study Subjects according to the Family Income (N=100)

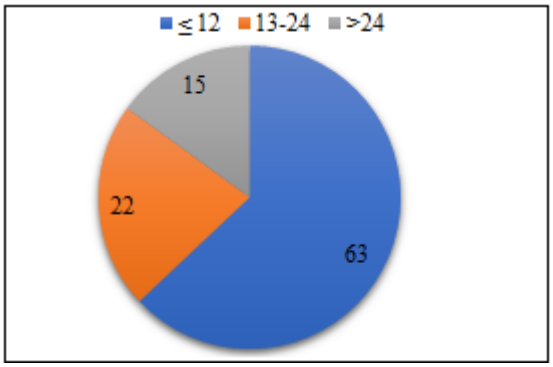
Family Income (Lakh)	No.	Percent
≤ 2	33	33.0
2-5	40	40.0
>5	27	27.0
Mean (SD)	3.81 (2.07)	
Range	1-10	



Graph 7: Distribution of Family Income

Table 8: Distribution of Study Subjects according to the Duration of Low Back Pain (Months) (N=100)

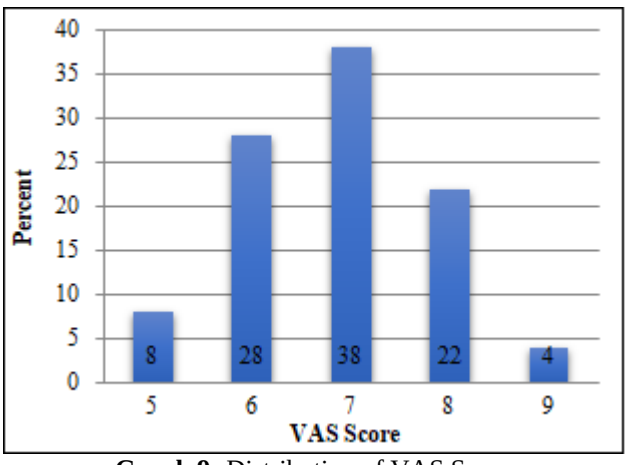
Duration (Months)	No.	Percent
≤ 12	63	63.0
13-24	22	22.0
>24	15	15.0
Mean (SD)	15.53 (13.09)	
Range	3-60	



Graph 8: Distribution of Duration

Table 9: Distribution of Study Subjects according to the VAS Score (N=100)

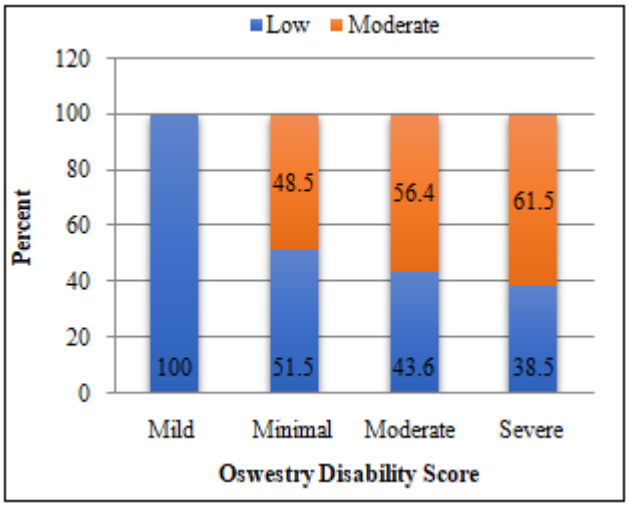
VAS Score	No.	Percent
5	8	8.0
6	28	28.0
7	38	38.0
8	22	22.0
9	4	4.0



Graph 9: Distribution of VAS Score

Table 10: Association between Oswestry Disability Score and Perceived Stress (N=100)

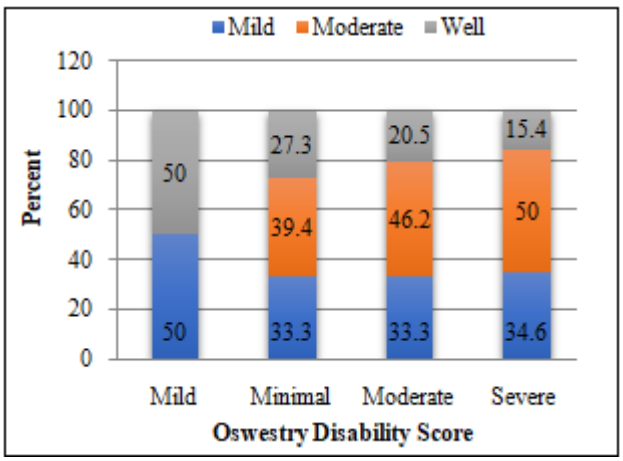
Disability Score	Perceived Stress	
	Low	Moderate
Mild	2 (100.0)	
Minimal	17 (51.5)	16 (48.5)
Moderate	17 (43.6)	22 (56.4)
Severe	10 (38.5)	16 (61.5)
Chi-Square Test, P Value = 0.329, Not Significant		



Graph 10: Oswestry Disability Score and Perceived Stress

Table 11: Association between Oswestry Disability Score and Kessler Score (N=100)

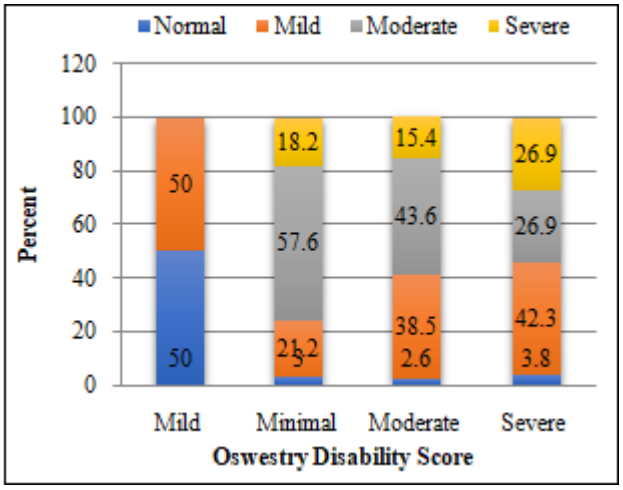
Oswestry Disability Score	Kessler Score		
	Mild	Moderate	Well
Mild	1 (50.0)		1 (50.0)
Minimal	11 (33.3)	13 (39.4)	9 (27.3)
Moderate	13 (33.3)	18 (46.2)	8 (20.5)
Severe	9 (34.6)	13 (50.0)	4 (15.4)
Chi-Square Test, P Value = 0.791, Not Significant			



Graph 11: Oswestry Disability Score and Kessler Score

Table 12: Association between Oswestry Disability Score and Depression Anxiety Stress Score (N=100)

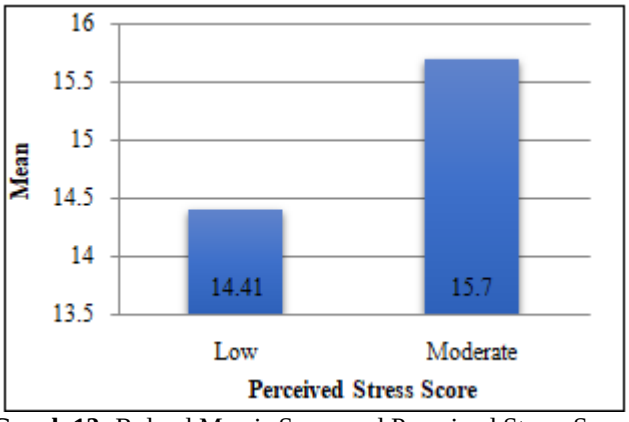
Disability Score	Depression Score			
	Normal	Mild	Moderate	Severe
Mild	1 (50.0)	1 (50.0)		
Minimal	1 (3.0)	7 (21.2)	19 (57.6)	6 (18.2)
Moderate	1 (2.6)	15 (38.5)	17 (43.6)	6 (15.4)
Severe	1 (3.8)	11 (42.3)	7 (26.9)	7 (26.9)
Chi-Square Test, P Value = 0.026, Significant				



Graph 12: Oswestry Disability Score and Depression Anxiety Stress Score

Table 13: Association between Back Pain Scores and Perceived Stress Score (N=100)

Perceived Stress	Roland Morris
	Mean (SD)
Low	14.41 (4.07)
Moderate	15.70 (4.43)
P Value	0.136
Unpaired t Test, P Value Not Significant	

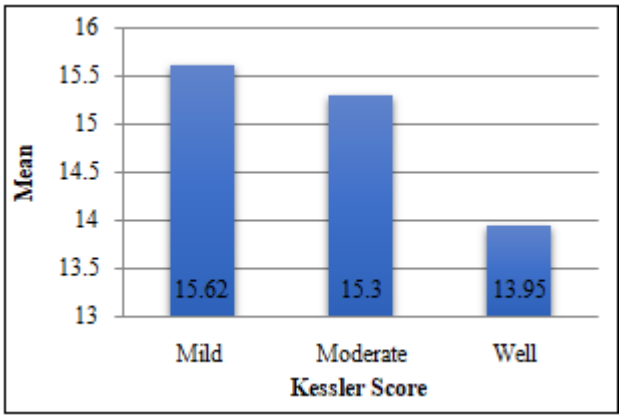


Graph 13: Roland Morris Score and Perceived Stress Score

Table 14: Association between Roland Morris and Kessler Score (N=100)

Kessler Score	Roland Morris
	Mean (SD)
Mild	15.62 (4.25)
Moderate	15.30 (4.11)
Well	13.95 (4.70)
P Value	0.346

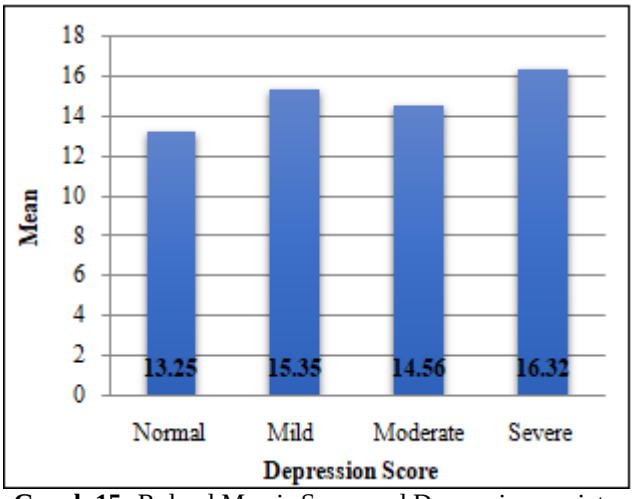
ANOVA, P Value Not Significant



Graph 14: Roland Morris Score and Kessler Score

Table 15: Association between Roland Morris score and Depression anxiety stress Score (N=100)

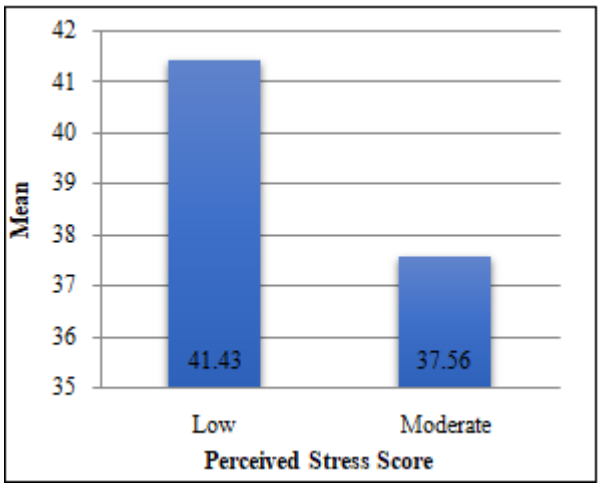
Depression, anxiety stress Score	Roland Morris
	Mean (SD)
Normal	13.25 (5.25)
Mild	15.35 (4.26)
Moderate	14.56 (4.11)
Severe	16.32 (4.60)
P Value	0.388
ANOVA, P Value Not Significant	



Graph 15: Roland Morris Score and Depression anxiety stress Score

Table 16: Association between Back Pain functional Scores and Perceived Stress Score (N=100)

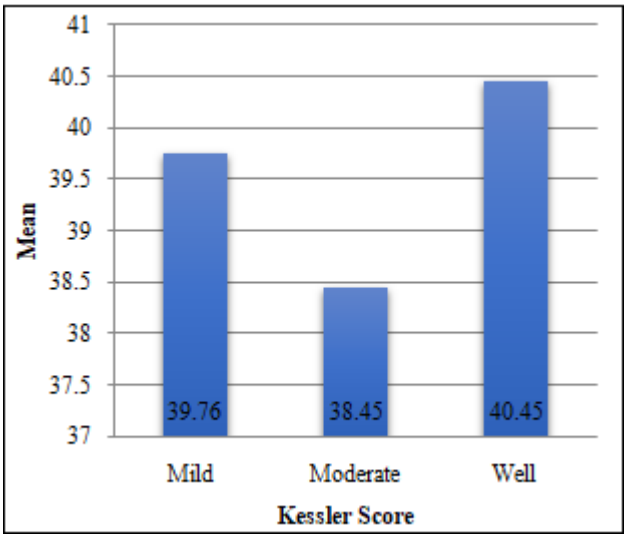
Perceived Stress	Functional Score
	Mean (SD)
Low	41.43 (9.54)
Moderate	37.56 (10.39)
P Value	0.056
Unpaired t Test, P Value Not Significant	



Graph 16: Functional Score and Perceived Stress Score

Table 17: Association between Back Pain functional Scores and Kessler Score (N=100)

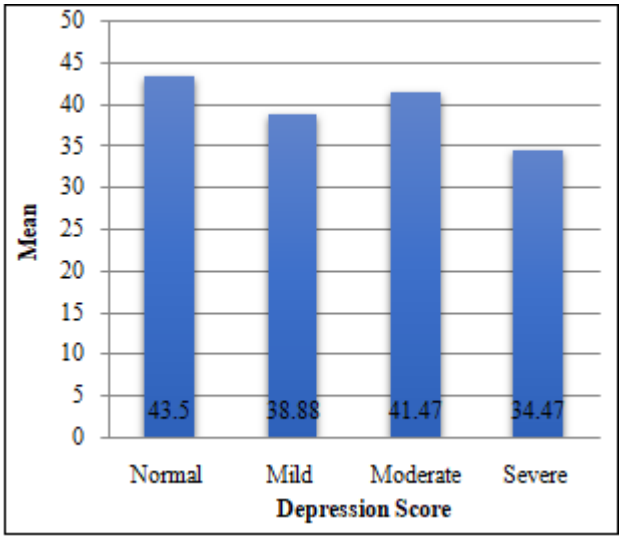
Kessler Score	Back pain functional Score
	Mean (SD)
Mild	39.76 (10.82)
Moderate	38.45 (9.89)
Well	40.45 (9.89)
P Value	0.723
ANOVA, P Value Not Significant	



Graph 17: Back pain functional Score and Kessler Score

Table 18: Association between Back Pain functional Scores and Depression anxiety stress Score (N=100)

Depression Score	Back pain functional Score
	Mean (SD)
Normal	43.50 (9.81)
Mild	38.88 (10.15)
Moderate	41.47 (9.96)
Severe	34.47 (9.47)
P Value	0.070



Graph 18: Back pain functional Score and Depression anxiety stress Score

Table 19: Combined p-value.

	Perceived stress scale	K10 score	Depression anxiety stress scale
Oswestry	0.329	0.791	0.026
Roland Morris	0.136	0.346	0.388
Back pain functional score	0.056	0.723	0.070

4. Discussion

Although many studies have been conducted in the past to find the correlation between lower back pain and psychological distress, most of the studies were conducted in the western world and large-scale data is scant in our country. We conducted a single centre, cross sectional study to correlate between psychological distress and lower back pain.Differences in occupation, such as job demands, workplace tension, and individuals' control in a certain occupation, may alter the degree of stress, resulting in variable rates of work-related injuries and so affecting the prevalence of LBP.

In our study, patients who fulfilled inclusion criterion were ask to fill questionnaire-psychological aspect viz Kessler scale, Perceived stress scale and Depression,anxiety, stress scale and lower back pain scales viz Oswestry low back pain disability questionnaire, Roland Morris low back pain and disability questionnaire, low back pain functionality score.

Demographic distribution:
A total of 100 patients (44 females and 56 males) were enrolled in the age group of 18 years to 65 years with a mean age of 42.11+/- 13.63 years. Age of the patients ranged from 18 years to 65 years. The mean age of the study subjects was 42 years with majority of the participants were between 31 to 40 years.

Socioeconomic status:
56% of the study subjects were lower middle class with mean income of 3.81+/- 2.07 lakhs/year. They accounted for majority of the patients.

Mean duration of LBP in study subjects: The mean duration of lower back pain in study subjects was 15.53+/- 13.09 months.
It was found that there is statistical association between DASS scale and Oswestry low back pain scale stating significant association between degree of stress and chronic LBP but no significant association between Oswestry low back pain scale and Kessler score, Oswestry low back pain scale and Kessler score tested by chi square test with p value of 0.791 and 0.329 respectively.

No statistical significance was found between Low back pain functionality score and Kessler score, Low back pain functionality score and perceived stress scale, Low back pain functionality score and depress, anxiety, stress scale, tested with ANOVA unpaired T test and ANOVA respectively.

Few previous studies conducted by Alturkistani et al revealed no significant association between LBP and stress levels of the patients while study conducted by Sungwoo Choi et al,Eric L. Hurwitz et al showed significant association.

Our study found no significant statistical correlation between lower back pain and psychological stress levels, consistent with previous studies. This suggests the need for further research and a multidisciplinary approach to managing lower back pain.

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Table 1: Questionnaire

Lower back Pain	Psychological distress
Oswestry Lower back pain questionnaire	Perceived stress scale
Roland Morris questionnaire	K10 (Kessler score)
Back pain functional score	Depression Anxiety stress scale

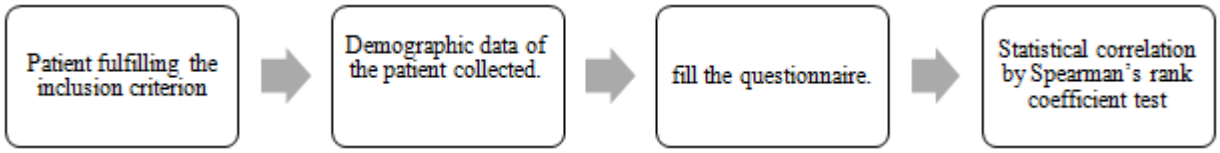

Figure 1: Study Procedure