



# THE THERAPIST

JOURNAL OF THERAPIES & REHABILITATION SCIENCES

<https://thetherapist.com.pk/index.php/tt>

Volume 4, Issue 1 (Jan-Mar 2023)



## Original Article

# Association of Low Back Pain with Body Mass Index and Stress among House Officers in Different Rotational Placements

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## ARTICLE INFO

### Key Words:

Low Back Pain, Body Mass Index, Stress, Junior Doctors, House Officers

### How to Cite:

Ghaffar, T. ., Sultan, S. ., Khalid, A. ., Anjum, H. ., Irum, A. ., Fawad, M. ., & Rao, A. . (2023). Association of Low Back Pain with Body Mass Index and Stress Among House Officers in Different Rotational Placements: Association of LBP with BMI and Stress. THE THERAPIST (Journal of Therapies & Rehabilitation Sciences), 4(1). <https://doi.org/10.54393/tt.v4i1.114>

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Received Date: 27 January, 2023

Acceptance Date: 26<sup>th</sup> March, 2023

Published Date: 31<sup>st</sup> March, 2023

## ABSTRACT

Low back pain (LBP) is the most common disorder affecting the back's muscles, nerves, and bones and affecting the quality of life. **Objective:** To find the association of LBP with body mass index and stress among house officers in different rotational placements. **Methods:** In this cross-sectional study, a sample of 170 participants were recruited. Oswestry disability index was used to assess the LBP and perceived stress scale was used to assess the stress. Inclusion Criteria includes house officers, both male and female and physical therapy internes. Exclusion Criteria includes disability, trauma and congenital disorder. Data were analyzed by IBM SPSS statistics version-25. **Results:** Out of 170 participants 10(5.9%) were underweight, 60(35.3%) were normal weight, 66(38.8%) were overweight and 34(20%) were obese. p value was .694 which showed that there is no association between LBP and body mass index. The p value for LBP and stress was .458 which showed there is no association. The p-value for LBP and different rotational placement was .000 which shows there is association present. **Conclusions:** There was no association found between LBP and body mass index, LBP and stress. There is association found between LBP and different rotational placements.

## INTRODUCTION

LBP is the most occurring disorder involving the muscles, nerves, and bones of the back that effects the quality of life [1]. Pain in low back is the key cause of disability worldwide and weighty load on the working population [2]. Although itself back pain is not dangerous but it effects the quality of life [3]. There is also an association between the LBP and sedentary life style. Prolong sitting and standing increases the risk of LBP is also associated with high work load, poor posture and related to the manual exertion in handling the objects of person. Poor posture or high work load may

fatigue the back muscles [4, 5]. LBP may be classified by duration as acute, sub-chronic, or chronic [6]. Hospital staff especially nurses and house officers are very prone to develop the LBP due to them prolong duty hours. Sometime their occupation may be harmful for their health and causes to produce the cumulative trauma disorder [7]. BMI and LBP have direct relation in each other [8]. BMI derivate from the height and weight to measure the body fat [9]. Obesity is one of the risk factors the provoke the pain in low back [10]. Through an increase in cortisol

secretion, increased calorie intake, and a sedentary lifestyle, chronic psychosocial stress may contribute to obesity [11]. Stress is known to have a significant impact on health, affecting cortisol secretion, depression, diabetes, obesity, and disturbed sleep [12]. Psychological work factors have been taken into consideration, and risk factors include low mood, low control, high work demand, monotony at work, low job satisfaction, and poor relationships with coworkers [13]. Body weight was viewed as a potential frail gamble sign of LBP [14]. Extreme mileage through expanded mechanical demand and metabolic variables related to weight has been believed to be answerable for low back torment in the stout [15]. Since workers' health is a composite of their mental, physical, and social well-being, shift work's multifaceted impact on these aspects must be thoroughly addressed [16].

## METHODS

After getting the institutional approval, a cross-sectional survey was conducted among house officers from Tertiary Care Hospitals of Faisalabad. Study was completed within 6 months after the approval of synopsis. 170 house officers were enrolled in this study. A convenient sampling technique was used. The sample was calculated as;

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

Sample size of 170 cases is calculated with 95% confidence interval, 9% margin of error and expected % of LBP as 47%. ODI and PSS questionnaire were used to get the data from house officers. ODI questionnaire used to evaluate the LBP and PSS questionnaire used to assess the stress. Both questionnaire contains 10 questions and both questionnaire have their own scoring. BMI was obtained by asking the weight and height of house officers. Inclusion Criteria includes house officers, both male and female and age 20-31. Exclusion Criteria includes disability, trauma and congenital disorders. Printed questionnaires were directly administrated to the house officers of different government and private hospitals. 19 house officers get from each rotational placement. 19 from medicine, 19 from surgery, 19 from emergency, 19 gynecology, 19 orthopedics, 19 pediatrics, 19 physiotherapies, 19 from psychiatrics and 18 from CCU. After completing the data, the data were analyzed through IBM SPSS statistics version 25.0. Calculated the descriptive statistics as mean ± standard deviation. chi square is used to analyze the association among different variables. Like by applying chi square test found the following results: there is no association found between LBP and BMI, LBP and stress. There was association found between LBP and different rotational placements. This study performed under the ethical considerations. The study had done on small size. This study was taken from the hospitals of Lahore only. There

was no follow up in this study. There was the problem while collecting the data because majority of house officers were not cooperative.

## RESULTS

Total 170 participants were asked to fill the questionnaire in this study. Part one of the questionnaire was about to demographic data age, gender, height, weight. The mean standard deviation of age was 23.75 ± 1.884. Minimum age of participants is 20 and the maximum age was 31. Out of 170 participants 41(23.1) were of 23 ages. Out of 170 participants 94(55.3%) were female and 76(44.7%) were male. Out of 170 participants 10(5.9%) were underweight, 60(35.3%) are normal weight, 66(38.8%) were overweight and 34(20%) were obese.

**Table 1:** Frequency and percentage of demographics, Pain and stress

Variables	F (%)
<b>Gender</b>	
Female	94 (55.3)
Male	76 (44.7)
<b>BMI ranges</b>	
Underweight=<18.5	10 (5.9)
Normal weight=18.5-24.9	60 (35.3)
Overweight=25-29.9	66 (38.8)
Obesity=BMI of 30 or greater	34 (20.0)
Underweight=<18.5	10 (5.9)
<b>Pain intensity</b>	
No pain	84 (49.4)
Mild pain	44 (25.9)
Moderate	31 (18.2)
Severe	9 (5.3)
Very severe	2 (1.2)

Table 2 showed the prevalence of lower back pain and stress in the participants. Out of 170 only 27 complaints about lower back pain.

**Table 2:** Prevalence of Low Back Pain and stress

Prevalence	N (%)
<b>Low back Pain</b>	
Yes	27 (15.9%)
No	143 (84.1%)
Total	170 (100%)
<b>Stress</b>	
Yes	34 (20%)
No	136 (79.3%)
Total	170 (100%)

Chi square was applied. p-value is .694 which was more than 0.5 which showed that there was no association between LBP and BMI (Table 3).

**Table 3:** Association of LBP with BMI

LBP	Underweight =<18.5	Normal weight = 18.5–24.9	Overweight = 25–29.9	Obesity= BMI of 30 or greater	p-value
Minimal disability (0-20%)	9	50	53	26	0.694
Moderate disability (21-40%)	1	8	10	8	
Sever disability (41- 60%)	0	2	3	0	

Chi square test was applied. p-value was .458 that was more than 0.05 which showed there was no association present between the LBP and perceived stress (Table 4).

**Table 4:** Association of low back pain with perceived stress

LBP	Low stress (0-13)	Moderate stress (14- 26)	High perceived stress (27-40)	p-value
Minimal disability (0-20%)	12	118	8	0.458
Moderate disability (21-40%)	0	26	1	
Sever disability (41- 60%)	0	5	0	

Chi square test was applied. p-value was .000 which was less than 0.05 that shows there was strong association present between the LBP and different rotational placements (Table 5). The house officers in medicine, orthopedics and physiotherapy ward have the greater chances to develop the minimal disability. Emergency house officers have greater chances to develop the moderate disability. CCU house officers has the greater chances to develop the sever disability.

**Table 5:** Association of low back pain with different rotational placements

LBP	Medicine	Surgery	Emergency	CCU	Gynae	PT	Paeds	Psychiatric	Ortho	p-value
Minimal disability(0-20%)	19	15	8	12	13	19	18	15	19	0.000
Moderate disability(21-40%)	0	4	11	3	5	0	1	3	0	
Severe disability (41- 60%)	0	0	0	3	1	0	0	1	0	

## DISCUSSION

This study was to check the association of LBP with different rotational placements, BMI and stress among house officers. Many work related and physical factors are involved in the progression of pain. Large number of working hours, improper posture, poor techniques, handling a large number of patients and inadequate positions are main factors to cause the LBP. A cross sectional study to determine the LBP and NP in medical students' association with the quality of life. This study had population of 506. ODI, PSS and VA scales were used [11]. It has been observed that there is the lofty prevalence of decreased and mild LBP and NP among the medical students. More quality of life issues due to LBP increased by prolong standing. LBP and NP are poorly associated with the level of stress. The relationship between MSK pain and psychological stress has been excellently described in the health professionals. The Results of current study were consistent with this literature show a great association between LBP and different rotational placements. But cannot found association between LBP and BMI, LBP and stress [17]. Karahan et al., conducted a cross sectional study to check the frequency of LBP, its associated features. 1600 participants were enrolled in study. 44-item questionnaire was used in the study. Population of the study was hospital staff. Many factors were associated with the occurrence of LBP like perceived stress, age, occupation, smoking and heavy lifting. Highest prevalence was in nurses which is 77.1%. It has been concluded that the

risk of pain can be reduced by preventive measures like proper body mechanics and rest [18]. The current study results showed similarity with this literature as 29.4% participant showed pain in lifting weights. 59.4% showed that they feel upset and stressed out most of time. LBP can be related with prolonged sitting and standing. Physical therapists are at the higher risk to develop the MSK disorders like work related LBP [19]. The current research study showed that the physiotherapist had disability but less than CCU ward house officers. Alshami et al., conducted a case control study to assess the association of psychological and physical factors with the LBP. PAQ, VAS and DAS scale were used between two groups. One group having LBP and other group's participant not having LBP but have same BMI and age. It has been observed that stress is present in the group which have the participants with LBP. Other psychological factors were observed that targeting the LBP [20]. However, the current research results were inconsistent with this literature as no association was found between stress and LBP among house officer. According to the study many work related activities among house officers produces LBP. Work related postures and positions, repetitive movements, prolong static posture, prolong standing, work burden may compensate pain produces the MSK disorders in the body.

## CONCLUSIONS

This study conclude that work associated LBP was present in the house officers but the prevalence of LBP among

house officers was low. House officers complain LBP during duty hours. Working in bad posture, prolonged standing, prolonged short sitting among house officers during work cause LBP. Many house officers documented that pain provokes during work was relieved by rest and medication. There is significant relation between LBP and different rotational placements (wards).

### Authors Contribution

Conceptualization: TG

Methodology: SS, HA

Formal analysis: AI, MF

Writing-review and editing: SS, AK, MF, AR

All authors have read and agreed to the published version of the manuscript.

### Conflicts of Interest

The authors declare no conflict of interest.

### Source of Funding

The authors received no financial support for the research, authorship and/or publication of this article.

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