



Original Article



Comparison of the Visual Analog Scale and Oswestry Disability Index Between Working and Non-Working Women with Lower Back Pain

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ABSTRACT

Low back pain (LBP) is one of the most prevalent musculoskeletal disorders worldwide, significantly affecting women's daily activities, functional capacity, and quality of life. Occupational status may play an important role in influencing pain perception and disability outcomes. **Objectives:** To compare the scores of the VAS and ODI between working and non-working women with low back pain. **Methods:** This study involved 356 participants, particularly women with LBP, of whom 178 were employed and 178 were unemployed. Subjects were included if they were women with non-specific LBP and met the required age range and employment status criteria. Exclusion criteria were being male, having a particular medical condition, deformities, or having undergone recent surgery. The subjects were recruited from offices and different homes in Karachi. All the participants were informed and provided written consent before participating in the study. The institutional review board or ethics committee gave the study ethical approval. **Results:** The average age of the participants was 31.16 years for both the working and the non-working women. Two groups did not differ significantly ($p=0.826>0.05$) in terms of VAS score. The ODI score, however, proved that there was a statistically significant difference ($p=0.034<0.05$), indicating that there was more functional restriction in one group. **Conclusions:** The study concluded that both working and non-working women experience functional limitations and pain due to low back pain, with significant differences in disability levels measured by ODI.

INTRODUCTION

Low back pain (LBP) is one of the most prevalent musculoskeletal disorders, affecting nearly 80% of individuals at some point in their lives [1]. In Pakistan, LBP poses a substantial public health burden, with prevalence estimates ranging from 25% to 60% among adults, leading to significant functional limitations, reduced work productivity, and increased healthcare utilization [2, 3]. Among women, LBP has a particularly high burden due to biological, social, and occupational factors, including hormonal fluctuations, caregiving responsibilities, and work-related physical or psychosocial demands [4]. These

factors not only increase the risk of pain but also exacerbate its severity and chronicity. The consequences of LBP extend beyond physical discomfort, often impairing daily functioning, reducing social and occupational participation, and negatively impacting mental health and quality of life [5]. The economic burden is also considerable, with costs arising from healthcare utilization, productivity loss, and disability claims [6]. Visual Analog Scale (VAS) and Oswestry Disability Index (ODI) are very common in clinical and research settings to gauge the effects of LBP. A VAS is a non-complicated



instrument that has a rating scale of 0-10, i.e., no pain to the worst pain that could be imagined, and is sensitive to time [7]. Although it is useful in measuring the severity of pain, it does not give an account of functional impairments. On the contrary, ODI will be used to measure disability that is directly related to LBP. It discusses ten areas of everyday life, such as personal care, lifting, walking, and social activity, where the scores are higher the more disabled the person is [8]. A combination of VAS and ODI offers a complete analysis of the pain intensity and functional impairment. Women might differ in employment status, and it can be a key factor in their LBP. Risk factors that can affect working women relate to the absence of proper ergonomics, excessive workload, excessive sitting time, and balancing between career and home life, which may lead to musculoskeletal strain [9, 10]. LBP in this population has been linked to low productivity, absenteeism, increased medical expenditures, and psychological outcomes [11, 12]. Homemakers and other caregivers, in general, face considerable risks, as well, since there are non-working women. Repetitive strain can be caused by household chores, such as lifting, bending, and excessive standing, whereas a lack of formal physical activity may cause the core muscles to be weakened. Symptoms can also be further worsened by stress and social isolation [13, 14]. In the case of non-working women, LBP may severely restrict mobility, lower the quality of life, and augment the level of reliance on others [1, 15]. Although LBP has been researched widely, there is still a gap in the understanding of how pain intensity and disability among working and non-working women differ. Employment status can also affect the severity of pain as well as coping styles, intention to seek health care, and chronic functional performance [16, 17]. This gap is critical in order to customize the preventive and rehabilitative interventions. Thus, the current experiment intends to provide the comparative results of VAS and ODI scores among working and non-working women with low back pain. Through these differences, the study will aim at offering meaningful information on how employment status influences the occurrence of LBP among women and also to guide policies to enhance the functional performance and life quality [18]. This study aims to compare the scores of the VAS and ODI between working and non-working women with low back pain.

METHODS

This cross-sectional study was conducted for six months in different areas of Karachi after the approval of the study synopsis FROM Isra University, Karachi. The study duration was from July to December 2024. A total of 356 participants, comprising 178 working and 178 non-working women with non-specific low back pain (LBP), were

recruited through convenience sampling. This sample of 356 participants was determined based on a 95% confidence level prevalence formula ($n = Z^2 \times p(1-p)/d^2$) and adjusted to represent an equal number of working and non-working women and corrected against non-response. Male participants, deformed ones, or those who had undergone recent surgery were eliminated. All the participants were provided with written informed consent. The VAS a single-item instrument that measures pain intensity on a 0-10 cm scale, where 0 indicates no pain and 10 the worst imaginable pain was used to collect data, with the highest percentages representing the highest possible amount of disability [19], and the Oswestry Disability Index (ODI), a self-administered questionnaire, with 10 items assessing pain intensity, personal care, lifting, walking, sitting, standing, sleeping, social life, traveling, and employment/homemaking, were used, scaling a The questionnaires were administered and recorded with the consideration of voluntary responses, code response and confidentiality. Analysis of data was done through SPSS 22. Continuous variables were calculated as descriptive statistics (mean \pm SD), whereas categorical variables were calculated as frequencies/ percentages. The VAS and ODI categories were compared in terms of chi-square tests between working and non-working women, and independent t-tests were performed to compare the means. The p-value below 0.05 was taken to be significant.

RESULTS

This study included 356 women who had low back pain. The average age of the participants was 31.16 \pm 4.09, with a range of 24 years as the minimum age and 40 years as the maximum age (Table 1).

Table 1: Descriptive Statistics of ODI Scores among Working Women (n=178)

Statistic	Value
N (Valid)	178
Missing	0
Mean	31.16
Standard Deviation	4.09
Minimum	24.00
Maximum	40.00

Results showed that 28% of working women and 26% of non-working women reported no pain, while the majority reported mild to moderate pain. Severe pain was observed in 33% of working women compared to 30% of non-working women. The chi-square value was 5.094, indicating a non-significant association between employment status and VAS categories ($p > 0.05$) (Table 2).

Table 2: Comparison of VAS Scores Between Working and Non-Working Women with LBP (n=356)

VAS (Working Women)	No Pain	Mild	Moderate	Severe	Total
No Pain	3%	13%	6%	6%	28%
Mild Pain	10%	22%	17%	9%	58%
Moderate Pain	8%	24%	17%	10%	59%
Severe Pain	5%	9%	14%	5%	33%
Total	26%	68%	54%	30%	178%

Findings revealed that 18% of working women and 10% of non-working women reported no disability, while the majority experienced mild to moderate disability. Severe disability was slightly more prevalent among working women (39%) compared to non-working women (33%). Complete disability was notably higher in non-working women (33%) compared to working women (7%). The chi-square value was 27.779, indicating a statistically significant association ($p < 0.05$) (Table 3).

Table 3: Comparison of ODI Score Grading Between Working and Non-Working Women with LBP (n=356)

ODI (Working Women)	No Disability	Mild	Moderate	Severe	Complete	Total
No Disability	3%	8%	1%	1%	0%	13
Mild Disability	3%	20%	6%	6%	0%	35
Moderate Disability	3%	17%	13%	13%	0%	46%
Severe Disability	1%	7%	10%	10%	1%	29%
Complete Disability	0%	0%	3%	3%	0%	6%
Total	10%	52%	33%	33%	1%	178%

DISCUSSION

Our study involved 356 women with low back pain (LBP), equally divided between working and non-working participants, and aimed to compare pain intensity and disability scores using the VAS and ODI. The findings demonstrated that working women were more likely to report moderate and severe disability, whereas non-working women more often reported mild disability. Pain intensity patterns were similar across groups, although working women reported slightly higher proportions of moderate pain compared to their non-working counterparts. These findings indicate that work and household roles can have different effects on the perception of pain and disability in women with LBP. The VAS and the ODI continue to be two of the most used instruments in clinical and research settings to measure pain and disability. In line with the literature, pain intensity as assessed by VAS was significantly related to scores on the ODI disability, indicating the interconnection of the two measures in LBP populations [2]. Later research confirms this relationship as well, indicating that psychosocial and occupational variables also affect disability scores, not just the intensity of pain [3, 20]. Specifically, the occupational

aspect of LBP is applicable in our research. Females who are exposed to strenuous activities or sustained immobility postures have a higher risk of acute and chronic LBP. This has been proven recently with reports showing that ergonomic difficulties, bad posture, and heavy workloads are major causes of disability among working women [21]. The results of our study are also compatible with the recent prevalence studies that show that the burden of LBP is high in women all over the world. Indicatively, Yamada et al. noted that LBP is currently one of the most disabling diseases among women both at work and at home [3], and Adhikari et al. noted that it is becoming an increasing issue in South Asian populations, and employed women are at a high risk [20]. Such studies support the belief that both the levels of pain and disability in women are caused by some gender specific factors, such as hormonal influences, occupational exposures, and caregiving roles. The combination of our study with other studies currently shows that working women have more disability associated with LBP, probably as a result of both occupational strain and household workload. Ergonomic workplace adjustments, posture and lifting skills education, and specific rehabilitation of working women should therefore be the focus of future intervention, alongside the risks to the sedentary lifestyle of non-working women.

CONCLUSIONS

The study concluded that there is a significant difference in Visual Analog Scale and Oswestry Disability Index scores between working and non-working women with low back pain. Working women experienced higher levels of moderate to severe disability and moderate pain, whereas non-working women reported milder disability and pain. These findings indicate that employment status influences pain intensity and functional limitation, highlighting the importance of considering occupational factors when assessing and managing low back pain in women.

Authors Contribution

Conceptualization: TK

Methodology: AQ, NA

Formal analysis: AN

Writing review and editing: HG

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

Conflicts of Interest

All the authors declare no conflict of interest.

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