

ERGONOMICS, SEDENTARY BEHAVIOR AND DISC HERNIATION IN YOUNG WORKING INDIVIDUALS

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Abstract - The modern workforce is increasingly engaged in sedentary jobs, which may impact musculoskeletal health, including the occurrence of disc herniation. This cross-sectional study explores the associations between ergonomics, sedentary behavior, and disc herniation symptoms among young working individuals. Participants aged 18-35 were recruited from an outpatient department. A structured questionnaire assessed ergonomic practices, sedentary behavior, and self-reported disc herniation symptoms. Chi-square tests and logistic regression analysis explored associations while considering confounders. Among 250 participants, those with lower workstation setup and posture scores were more likely to report disc herniation symptoms ($p < 0.05$). Poorer ergonomic practices were linked to increased odds of symptoms (OR = 0.72, $p < 0.001$), as were poorer posture (OR = 0.81, $p = 0.032$) and lower physical activity (OR = 0.64, $p < 0.001$). The study highlights the role of poor ergonomic practices and sedentary behavior in the likelihood of disc herniation symptoms among young working individuals. Addressing these factors may hold promise in preventing such symptoms, contributing to spinal health promotion in workplaces.

IndexTerms - ergonomic practices, sedentary behavior, disc herniation symptoms, young adults

1. INTRODUCTION:

The modern workforce is witnessing a significant shift in occupational dynamics, with an increasing number of young adults engaged in sedentary jobs that involve prolonged sitting and computer-related tasks. While the detrimental effects of sedentary behavior on overall health are well-documented, the potential impact of such work patterns on specific musculoskeletal conditions, such as disc herniation, remains a topic of growing concern. Disc herniation, characterized by the protrusion of intervertebral disc material, is traditionally associated with aging; however, recent trends suggest a rise in its occurrence among young working individuals.

This cross-sectional study seeks to explore the complex interrelationship between ergonomics, sedentary behavior, and the prevalence of disc herniation in the context of young working professionals. Ergonomics, the science of designing workspaces to optimize efficiency and reduce discomfort, plays a pivotal role in understanding how occupational factors can influence spinal health. Sedentary behavior, an integral part of contemporary work environments, has been associated with various musculoskeletal issues. Understanding how these factors interact and contribute to the emergence of disc herniation in young adults is essential for developing targeted interventions and preventive strategies.

The primary aim of this study is to investigate the association between ergonomics, sedentary behavior, and the occurrence of disc herniation symptoms among young working individuals. By examining these variables within a cross-sectional framework, we aim to provide insights into the prevalence of disc herniation in this population and uncover potential links to ergonomic practices and sedentary behavior patterns.

Through a comprehensive survey and analysis, we intend to contribute to the existing body of knowledge on the effects of contemporary work environments on spinal health. The findings of this study could have far-reaching implications for workplace policies, interventions, and educational efforts aimed at safeguarding the spinal well-being of young professionals.

2. METHODOLOGY:

This cross-sectional study aimed to investigate the association between ergonomics, sedentary behavior, and the prevalence of disc herniation symptoms among young working individuals. Participants were recruited from an outpatient department of a healthcare facility.

Inclusion Criteria:

- Participants aged between 18 and 35 years
- Participants currently employed in full-time or part-time work
- Participants without a history of pre-existing spinal conditions

Exclusion Criteria

- Participants younger than 18 or older than 35 years.
- Unemployed individuals or those not engaged in work at the time of the study
- Participants with a history of known spinal conditions, surgeries, or spinal trauma

Procedure:

Consecutive patients visiting the OPD for non-specific musculoskeletal complaints were approached for participation. The study's purpose, procedures, confidentiality measures, and potential benefits were explained to potential participants. Informed consent was obtained from individuals who expressed interest in participating.

A structured questionnaire was developed based on validated scales and existing literature. The questionnaire was designed to collect information on ergonomic practices, sedentary behavior, and self-reported disc herniation symptoms.

Ergonomic practices: Participants were asked about their workstation setup, seating posture, frequency of breaks, and awareness of ergonomic guidelines

Sedentary behavior: Questions focused on daily sitting duration, types of sedentary activities, physical activity engagement, and perceived discomfort.

Disc herniation symptoms: The questionnaire included questions about the presence and severity of symptoms such as back pain, leg pain, and sensory disturbances.

Data analysis: Descriptive statistics, including means, standard deviations, frequencies, and percentages, were employed to summarize participant characteristics, ergonomic practices, sedentary behavior patterns, and reported disc herniation symptoms. Chi-square tests and logistic regression analysis were conducted to explore potential associations between ergonomic practices, sedentary behavior, and the likelihood of disc herniation symptoms, while adjusting for potential confounding factors such as age, gender, and physical activity levels.

3. RESULT:

Participant Characteristics

A total of 250 participants were included in the study. Table 1 presents the descriptive statistics for participants' characteristics.

Table 1: Descriptive Statistics for Participant Characteristics

characteristics	Mean (SD) or 5
Age (years)	28.4 (4.2)
Gender	
-Male	40%
-female	52%
Employment type	
-Office based	72%
-Technology based	20%
-administration	8%

Ergonomic Practices and Sedentary Behavior

Table 2: descriptive statistics for participants' reported ergonomic practices and sedentary behavior

Variable	Mean (SD)	Range
Workstation setup score	7.6(1.2)	5-10
Posture score	3.2(0.8)	2-5
Break frequency	2.5 (0.9)	1-4
Daily sitting duration	6.7 (1.5) hours	4-10 hours

Disc Herniation Symptoms

80 (32%) reported experiencing disc herniation symptoms. Table 3 summarizes the reported symptoms

Table 3: Reported Disc Herniation Symptoms

Symptoms	Frequency	Percentage
Back pain	65	26%
Leg pain	45	18%
Sensory disturbances	25	10%

Associations between Ergonomic Practices, Sedentary Behavior, and Disc Herniation Symptoms

Chi-square tests were performed to explore the association between ergonomic practices, sedentary behavior, and the likelihood of disc herniation symptoms. The results are summarized in Table 4

Table 4: Associations between Ergonomic Practices, Sedentary Behavior, and Disc Herniation Symptom

Variables	Disc herniation symptoms	No disc herniation symptoms	P value
Workstation setup score			0.001
-≤6	35%	15%	
->6	65%	85%	
Posture score			0.002
-≤3	42%	22%	
->3	58%	78%	

Logistic regression analysis was conducted to examine the adjusted association between ergonomic practices, sedentary behavior, and the likelihood of disc herniation symptoms, while controlling for potential confounding factors including age, gender, and physical activity level. The results of the logistic regression analysis are presented in Table 5.

Table 5: Logistic Regression Analysis for Disc Herniation Symptoms

variable	Odds ratio (95% CI)	P value
Workstation setup score		
-≤6	0.72 (0.60-0.86)	<0.001
->6		
Posture score		
-≤3	0.81 (0.67 – 0.98)	0.032
->3		
Physical activity score		
-≤4	0.64 (0.51- 0.81)	< 0.001
->4		

4. DISCUSSION:

The present study aimed to investigate the associations between ergonomic practices, sedentary behavior, and the likelihood of experiencing disc herniation symptoms among young working individuals. The results of the chi-square tests and logistic regression analysis provide valuable insights into the potential relationships between these factors while accounting for potential confounding variables.

Our findings indicated that participants with lower workstation setup scores were more likely to report disc herniation symptoms. This aligns with previous research that emphasizes the importance of proper ergonomic practices in reducing the risk of musculoskeletal issues, including disc-related symptoms (Hoozemans et al., 2004; Bao et al., 2019). The role of ergonomics in minimizing spinal stress and enhancing overall musculoskeletal health is well-documented, underscoring the significance of addressing workplace ergonomics (Buckle & Devereux, 2002).

Similarly, poorer posture scores were associated with an increased likelihood of experiencing disc herniation symptoms. Our findings resonate with prior studies that link suboptimal posture to increased spinal load and the development of musculoskeletal disorders (Lis et al., 2007; Falla et al., 2007). Postural control and alignment are vital in maintaining spinal integrity, and interventions promoting correct postural habits may help prevent disc herniation symptoms among young professionals (O'Sullivan, 2000).

Furthermore, the logistic regression analysis indicated that participants with lower physical activity scores had significantly higher odds of reporting disc herniation symptoms. This finding highlights the potential interplay between sedentary behavior and spinal health. Sedentary lifestyles have been associated with various musculoskeletal issues and may contribute to the development of disc herniation symptoms (Sjogren et al., 2014; Shiri et al., 2018). Promoting regular physical activity may have a protective effect against such symptoms by enhancing spinal stability and promoting overall well-being.

It is noteworthy that the associations between ergonomic practices, sedentary behavior, and disc herniation symptoms remained significant even after adjusting for potential confounding factors such as age, gender, and physical activity levels. This suggests that these factors have independent contributions to the likelihood of experiencing disc-related symptoms.

However, several limitations should be acknowledged. Cross-sectional studies inherently limit the establishment of causal relationships, and self-reported data may introduce response bias. Additionally, the study relied on participant recall of symptoms and behaviors, which may affect the accuracy of reported information.

This study contributes to the understanding of factors associated with disc herniation symptoms among young working individuals. The significant associations observed between ergonomic practices, sedentary behavior, and disc herniation symptoms underscore the importance of addressing these factors to promote spinal health and prevent musculoskeletal issues in the workplace. Future research could explore longitudinal designs to further elucidate the causal relationships between these variables and the development of disc herniation symptoms.

5. CONCLUSION:

Our cross-sectional study revealed that poor ergonomic practices and increased sedentary behavior are associated with a higher likelihood of experiencing disc herniation symptoms among young working individuals. This suggests that workplace interventions to improve ergonomics and promote physical activity could play a crucial role in preventing such symptoms. The associations remained significant even after accounting for potential confounders, emphasizing the importance of these factors in spinal health. While the study has limitations, such as its cross-sectional nature and reliance on self-reported data, it provides valuable insights into the relationship between these variables. Future research could explore causality through longitudinal studies and consider other contributing factors. Overall, addressing ergonomic practices and sedentary behavior in the workplace could help mitigate the risk of disc herniation symptoms and enhance the well-being of young professionals.

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