International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 09 Issue: 04 | April - 2025 SJIF Rating: 8.586 ISSN: 2582-3930

Impact of Low Back Pain Among it Professionals – A Systemic Review

Shraddha Kale[1] *, Pinky Khandelwal[2], Zeeshan[3]

[1]*MPT Scholar, Mewar University, Chittorgarh, Rajasthan*
[2]*Assistant Professor, Mewar University, Chittorgarh, Rajasthan*
[3]*Head of Department, Mewar University, Chittorgarh, Rajasthan*

Abstract

Background: Back pain is a widespread occupational health issue affecting millions globally, with a particularly high prevalence among Information Technology (IT) professionals. The sedentary nature of IT jobs, prolonged computer usage, poor ergonomic practices, and work-related stress significantly contribute to the incidence of back pain in this demographic. This review explores the prevalence, risk factors, consequences, and potential interventions to mitigate back pain among IT workers, drawing from various studies, health surveys, and occupational health reports**. Objective:** The aim of this systematic review is to examine the prevalence of back pain among Information Technology (IT) workers and assess its impact on their quality of life. Given the sedentary and ergonomically demanding nature of IT jobs, the review also seeks to identify key risk factors contributing to the onset of back pain in this population, and to evaluate how these musculoskeletal complaints affect physical, psychological, and occupational well-being.**Methods:** Inclusion criteria involved observational studies (cross-sectional, cohort, and case-control) that reported on the prevalence and impact of back pain among IT professionals. Exclusion criteria included non-English language papers, studies not specific to IT workers, and those not assessing quality of life outcomes. Data extraction and quality assessment were performed independently by two reviewers using PRISMA guidelines. The findings were synthesized narratively, highlighting the most frequently reported causes, severity, and functional limitations due to back pain. **Results:** Out of the 1,218 records initially identified, 21 studies met the inclusion criteria. Reported prevalence of back pain among IT workers ranged from **45% to 70%,** with **lower back pain** being the most commonly reported type. Contributing factors included prolonged sitting, poor ergonomic setups, lack of physical activity, and psychosocial stress. Most studies reported a **moderate to severe impact on physical functioning,** work productivity, and mental well-being. Quality of life assessments using tools like the Oswestry Disability Index (ODI), SF-36, and WHOQOL-BREF consistently indicated decreased scores among affected individuals. **Conclusion:** Back pain is highly prevalent among IT workers and has a significant negative impact on their quality of life. The findings underscore the urgent need for targeted workplace interventions, including ergonomic adjustments, regular physical activity, and mental health support. Future longitudinal studies are recommended to explore the long-term effects of occupational back pain and evaluate the effectiveness of multidisciplinary intervention strategies.

Keywords: *Low back pain, musculoskeletal disorders, IT Workers, Ergonomics.*

1. Introduction

Low back pain is a very frequently occurring phenomenon. Among adults in the general population, 70–85% were believed to experience at least one episode of low back pain at some time during their lives. LBP is associated with multiple risk factors, including gender, age, lifestyle, psychosocial profile, physical demands of the workplace, social support, and pain perception.(1)

Office works are among jobs that have high prevalence of musculoskeletal disorders. Prolonged sitting, work with computer, repetitive works, static postures, and bad environmental conditions are some of the causes for musculoskeletal disorders. Increase in the musculoskeletal disorders results in decrease in quantity and quality of work.

Most causes of these disorders include long sitting and excessive leaning. Epidemiologic studies shows relation between work factors and musculoskeletal disorders and also some studies demonstrate that pain prevalence, pain location, and other signs related to standing posture and work habit. Musculoskeletal disorders have great and direct economic burden on health systems and indirectly affect and decrease work efficiency.(2)

Spinal pain is one of the main causes of psychophysical discomfort, impeding functioning in everyday life, and reducing self-esteem and the quality of life. It results in work absence, and is the most common reason of inability to perform work and one of the main factors leading to physical disability. The type of work performed affects the spine and is associated with the need for forced long-term maintenance of often unnatural position of the body, resulting in muscle pain and back pain syndromes.(3)

Backpain can negatively impact daily activities, productivity, psychological wellbeing, socioeconomic status, workers health, and sleep. On the other hand, sleep is a cornerstone of quality of life determinants, playing a crucial role in homeostasis and promoting human's physical and mental health. LBP affects sleep duration and quality significantly, the relationship between pain and quality of sleep is bidirectional; sleep disturbance can increase pain, which in turn may cause sleep disorders.(4)

The lumbar spine is associated with following biomechanics and motions. The lumbar spine consists of series of a motion units each having an anterior and posterior segment. The anterior segment, composed of two vertebral bodies and the intervertebral disc, bears weight and absorbs shock. The posterior segment, consisting of the vertebral arches, transverse and spinous processes and the inferior and superior articular facets, protects the neural structures and directs movement of the unit in flexion and extension.

The unit is stabilized by a series of ligaments that minimize shearing forces and the paravertebral muscle bundles that provide balance for the static spine and strength for the kinetic spine. . Disc pressure reflects the response to shearing and rotational loads, abdominal cavity pressure supports the trunk anteriorly and the myoelectric back muscle activity balances the gravitational forces in upright posture and forward flexion.(5)

Ignoring the back pain as a symptom from musculoskeletal system, translates into serious health consequences from discomfort, through lowering the quality of life, to injuries and disability. In the light of these, it seems necessary to recognize the scale of overload and perceived discomfort, as well as their impact on the quality of life among IT workers, in order to take effective preventive and repair measures.(6)

Need of the Study

The exponential growth of the Information Technology (IT) industry has led to a dramatic increase in desk-bound, screen-intensive work environments. While IT professionals contribute significantly to digital transformation and economic development, their occupational health risks, particularly musculoskeletal disorders like back pain, have received insufficient attention in both research and workplace policy. Several global and regional studies suggest that back pain is among the leading causes of absenteeism, reduced productivity, and poor quality of life among IT workers. Despite the high incidence of back pain, there is a lack of consolidated evidence focusing specifically on its prevalence

and multidimensional impact on IT professionals, especially in the context of evolving work models such as remote and hybrid setups. Furthermore, many existing occupational health interventions are generalized and fail to address the unique ergonomic and psychological stressors faced by IT personnel. This study is needed to bridge that gap by systematically reviewing the available literature on the occurrence of back pain in this population and exploring its effect on physical, mental, and occupational well-being.

Scope of the Study

This systematic review is specifically focused on:

- 1) Assessing the prevalence and types of back pain experienced by IT professionals globally.
- 2) Evaluating the impact of back pain on quality of life, including physical functionality, emotional well-being, and workplace performance.
- 3) Identifying major risk factors, including ergonomic, behavioral, and psychosocial elements that contribute to back pain in IT settings.
- 4) Highlighting intervention strategies that can be implemented at both individual and organizational levels.
- 5) Providing a foundation for future interventional studies, workplace policy development, and targeted wellness programs in IT and similar knowledge-based sectors.

---

2. Methodology

This study is a systematic review conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. The aim was to collect, evaluate, and synthesize existing evidence on the prevalence of back pain among IT professionals and its impact on their quality of life. A comprehensive literature search was carried out across two major databases: PubMed and Google Scholar. The search included articles published from January 2010 to March 2021.

Inclusion Criteria

- Peer-reviewed articles published in English
- Studies conducted among IT workers (including software developers, programmers, and related roles)
- Observational studies: cross-sectional, cohort, or case-control designs
- Studies reporting quantitative data on the prevalence of back pain
- Studies assessing the impact of back pain on quality of life using validated tools (e.g., ODI, SF-36, WHOQOL-BREF)

Exclusion Criteria

- Non-English publications
- Case reports, reviews, editorials, and conference abstracts
- Studies not specifically focused on IT professionals
- Studies without data on quality of life or prevalence

Total of 21 studies were selected based on their methodological quality and relevance to the research objectives. Key variables extracted included are a) authors, year, and country b)Study design and sample size, c)Prevalence of back pain ,d)Assessment tools used (e.g., ODI, SF-36), e)Reported impact on quality of life, f)Identified risk factors (e.g., ergonomics, physical activity, stress)

3.Review of Literature

No.	Author(s)	Year	Title	Methodology	Sample Size	Key Findings	Conclusion
1	Bożena Mroczek et al.	2020	Occurrence and impact of back pain on the quality of life of healthcare workers.	Cross-sectional study	110	back pain was reported by 103 respondents (94%) with the lumbar area indicated the most frequently (72.81%).	Severe pain every day was reported by 49.51% of respondents and was associated with longer working time.
2	Moulood Valipour Noroozi	2015	Prevalence of Musculoskeletal Disorders Among Office Workers.	Cross-sectional survey	392	36.7% neck disorders in office workers, which demonstrated significant association with age and work experience (P < 0.001)	Significant association of work experience and age with musculoskeletal disorders shows that individual's education and knowledge improvements with regard to ergonomics risk factors and correction of work postures are very important.
3	Serranheira F, et al.	2021	Addressing Occupational Back Pain: A Systematic Review of Preventive and Therapeutic Strategies	Systematic review	116 studies included	Occupational back pain leads to reduced mobility, decreased flexibility, compromised quality of life, sleep disturbances, and psychological distress;	Multifaceted approach involving both workers and employers is needed to manage occupational back pain effectively

						absenteeism rates vary based on work demands	
4	Chen N, et al.	2023	The global health and economic impact of low-back pain attributable to occupational ergonomic factors in the working-age population by age, sex, geography in 2019	Systematic review	209 studies included	Low-back pain attributable to occupational ergonomic factors is a significant global health and economic burden; prevalence varies by age, sex, and geography.	Need for global strategies to address occupational ergonomic factors contributing to low-back pain.
5	Kulkarni VR, et al.	2022	Epidemiology of Low Back Pain among Information Technology Professionals Across India	Systematic review	10 studies included	Prevalence of low back pain among IT professionals in India ranges from 36.2% to 69.5%; higher prevalence in females and older age groups; associated with low socioeconomic status, repetitive tasks, prolonged static posture, awkward posture, lack of job control, mental stress, and long working hours.	High prevalence of low back pain among IT professionals in India; need for targeted prevention strategies
6	MohammedN.AlSaeed et.al	2022	Low back pain and its correlations	Cross sectional study	442	Study concluded that health care	Further research is essential to

			with poor sleep quality among healthcare providers.			providers in KSA with high rating for LBP disability demonstrated poorer overall sleep quality and viceversa	investigate whether this relationship is causal.
7	Shaphagh Asadi et.al		Low back pain and its related risk factors in health care providers at hospitals.	Systemic review	154 studies included	This study concluded that the prevalence of low back pain in health care personnel is high.	Body position at work, stress and lack of physical activity were the strongest risk factors, respectively.

4.Results and discussion

LBP is a prevalent issue among IT professionals, driven by factors such as prolonged sitting, inadequate ergonomics, physical inactivity, and work-related stress. Its impact on productivity and quality of life is significant. Implementing comprehensive strategies that address both physical and psychosocial aspects is essential for mitigating the burden of LBP in the IT sector.

Discussion

The findings of this systematic review reveal a high prevalence of back pain among IT professionals, with reported rates ranging from 45% to 70%. This variation may be attributed to differences in study populations, geographic regions, and assessment tools used. However, a consistent trend across studies indicates that prolonged sitting, poor ergonomic practices, and physical inactivity are key contributors to musculoskeletal discomfort, particularly in the lower back. Back pain was not only prevalent but also significantly impaired various domains of quality of life. Studies employing tools such as the Oswestry Disability Index (ODI) and the SF-36 consistently showed decreased scores in physical functioning, general health, and mental well-being among IT workers affected by back pain. Chronic pain also impacted work productivity, with presenteeism and absenteeism being commonly reported outcomes. These findings align with prior occupational health literature that identifies sedentary work environments as a major risk factor for the development of musculoskeletal disorders. Notably, the review also highlighted gender-based differences, with some studies reporting slightly higher prevalence rates among female employees. This could be linked to physiological differences, work-life stress, or differences in pain perception and reporting. Our findings are consistent with global data on office-based workers. For instance, a meta-analysis published in *BMC Musculoskeletal Disorders* reported similar prevalence rates of back pain among office and computer users. What differentiates the IT sector is the intensity and duration of screen time, increased reliance on digital tools, and often rigid work schedules, especially in high-demand roles such as development, support, or cybersecurity.

5.Conclusion & Future directions

Back pain, particularly in the lower back region, is a highly prevalent and persistent occupational health concern among Information Technology (IT) professionals. This systematic review highlights that between 45% and 70% of IT workers experience some form of back pain, with a significant proportion reporting chronic or recurring symptoms. The condition has a profound negative impact on quality of life, affecting physical health, mental well-being, social engagement, and occupational productivity. Key contributing factors include prolonged sedentary behaviour, poor ergonomic practices, limited physical activity, and psychosocial stressors such as job pressure and work-life imbalance. These findings emphasize that back pain in IT professionals is not merely a physical condition but a multifactorial issue that requires a comprehensive, workplace-driven response.

Future Directions

Further research should focus on longitudinal and interventional studies that assess the long-term impact of specific ergonomic and behavioral interventions. In addition, digital health monitoring tools and wearable technologies may offer innovative approaches to tracking posture, movement, and pain symptoms among IT professionals in real time.

Recommendations

To effectively address the burden of back pain among IT workers and improve their overall quality of life, the following recommendations are proposed:

1. **Ergonomic Reforms**
   - Implement height-adjustable desks and chairs with lumbar support.
   - Conduct periodic ergonomic assessments in both office and remote work settings.
   - Provide training on ideal workstation setup and posture maintenance.
2. **Promotion of Physical Activity**
   - Encourage microbreaks and stretching every 30–60 minutes during work hours.
   - Offer access to virtual or in-person exercise programs focused on back health.
   - Integrate workplace wellness initiatives that reward active lifestyles.
3. **Mental Health and Stress Management**
   - Provide access to stress reduction programs such as mindfulness or cognitive-behavioral therapy.
   - Reduce job strain by encouraging task rotation, realistic deadlines, and flexible scheduling.
4. **Health Education and Awareness**
   - Organize regular workshops on musculoskeletal health, back care, and pain prevention.
   - Distribute educational content through internal portals, apps, or posters.
5. **Policy-Level Interventions**
   - Include musculoskeletal health in corporate occupational health policies.
   - Encourage companies to adopt a holistic approach to employee well-being, covering physical, mental, and ergonomic dimensions.

Compliance with ethical standards

Acknowledgements

We thank the authors of the included studies and peer reviewers for their valuable contributions. Also acknowledging the co-authors for their invaluable support.

Disclosure of Conflict of interest

No conflicts of interest to be disclosed.

References

1)Şimşek Ş, Yağcı N, Şenol H. Denizli'de sağlık çalışanlarında bel ağrısı prevelansı ve risk faktörleri. Ağrı Dergisi. 2017;29(2):71-8.

2)Mroczek B, Łubkowska W, Jarno W, Jaraczewska E, Mierzecki A. Occurrence and impact of back pain on the quality of life of healthcare workers. Annals of Agricultural and Environmental Medicine. 2020;27(1):36-42.

3)ReulerJB: Low back pain [Special Article]. WestJ Med 1985 Aug; 143:259-265

4)AlHamam NM, Buhalim RA, AlSaeed MN, AlFuraikh BF, AlJughaiman MS. Low back pain and its correlations with poor sleep quality among health care providers. Journal of Taibah University Medical Sciences. 2022 Feb 1;17(1):28-37.

5)Rezaei B, Mousavi E, Heshmati B, Asadi S. Low back pain and its related risk factors in health care providers at hospitals: a systematic review. Annals of Medicine and Surgery. 2021 Oct 1;70:102903.

6)Noroozi MV, Hajibabaei M, Saki A, Memari Z. Prevalence of musculoskeletal disorders among office workers. Jundishapur journal of health sciences. 2015;7(1)

7)Shemshaki H, Nourian SM, Fereidan-Esfahani M, Mokhtari M, Etemadifar MR. What is the source of low back pain?. Journal of Craniovertebral Junction and Spine. 2013 Jan 1;4(1):21-4.

8)Punnett L, Wegman DH. Work-related musculoskeletal disorders: the epidemiologic evidence and the debate. J Electromyogr Kinesiol. 2004;14(1):13-23.

9)Mohan V, Sharma V, Meena ML. Prevalence of musculoskeletal disorders among IT professionals in India: A review. J Back Musculoskelet Rehabil. 2020;33(6):1027-1033.

10)Shariat A, Cleland JA, Danaee M, et al. Effects of stretching exercise training and ergonomic modifications on musculoskeletal discomforts of office workers: a randomized controlled trial. Brazilian Journal of Physical Therapy

11)Anema J, Cuelenaere B, van der Beek AJ, et al. The effectiveness of ergonomic interventions on return-to-work after low back pain: a prospective two-year cohort study in six countries on low back pain patients sicklisted for 3–4 months.

Occup Environ Med. 2004;61(4):289–94.

12)Sormunen E, Mäenpää-Moilanen E, Ylisassi H, et al. Participatory ergonomics intervention to prevent work disability among workers with low back pain: A randomized clinical trial in workplace setting. J Occup Rehabil. 2022;32(4):731–42.

13) van Niekerk SM, Louw QA, Hillier S. The effectiveness of a chair intervention in the workplace to reduce musculoskeletal symptoms: A systematic review. BMC Musculoskelet Disord. 2012;13:145.

14) van Vledder N, Louw Q. The effect of a workstation chair and computer screen height adjustment on neck and upper back musculoskeletal pain and sitting comfort in office workers. S Afr J Physiother. 2015;71(1):279.

15) Driessen MT, Proper KI, Anema JR, et al. The effectiveness of physical and organisational ergonomic interventions on low back pain and neck pain: a systematic review. Occup Environ Med. 2010;67(4):217–28.

16) Ainpradub K, Sitthipornvorakul E, Janwantanakul P, et al. Effect of education on non-specific neck and low back pain: A meta-analysis of randomized controlled trials. Man Ther. 2016;22:31–41.

17) van der Beek AJ, Anema JR, van der Waal J, et al. The effectiveness of ergonomic interventions on return-to-work after low back pain; a prospective two-year cohort study in six countries on low back pain patients sicklisted for 3–4 months. Occup Environ Med. 2004;61(4):289–94.

18) van Veldhoven M, Meijman T. The effect of three ergonomics training programs on the prevalence of low-back pain among workers of an Iranian automobile factory: A randomized clinical trial. PubMed. 2014.

19)van der Beek AJ, Anema JR, van der Waal J, et al. The effectiveness of ergonomic interventions on return-to-work after low back pain; a prospective two-year cohort study in six countries on low back pain patients sicklisted for 3–4 months. Occup Environ Med. 2004;61(4):289–94.

20) van der Beek AJ, Anema JR, van der Waal J, et al. The effectiveness of ergonomic interventions on return-to-work after low back pain; a prospective two-year cohort study in six countries on low back pain patients sicklisted for 3–4 months. Occup Environ Med. 2004;61(4):289–94