



WORK RELATED ERGONOMIC MODIFICATIONS ADOPTIONS AMONG PHYSIOTHERAPISTS: A CROSS-SECTIONAL STUDY

Physiotherapy

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ABSTRACT

The integration of ergonomic principles is crucial in physiotherapy practice to mitigate the risk of work-related musculoskeletal disorders (WRMDs) and enhance practitioner well-being. This descriptive cross-sectional study, aimed to assess the adoption of ergonomic modifications among 70 physiotherapists. Through simple purposive sampling, participants completed a validated self-based questionnaire, with responses analyzed to understand trends in ergonomic practices. Results unveiled varying levels of adoption for ergonomic modifications, with higher utilization observed for posture-related changes compared to those addressing mechanical stress, workplace injury prevention, and work design/equipment. Factors hindering adaptation included time constraints, lack of awareness, financial limitations, and resistance to change. To promote a safer workplace, employers should prioritize ergonomic education and strategies, empowering physiotherapists to optimize their environment, reduce the risk of WRMDs, and ensure sustainable patient care.

KEYWORDS

ergonomics, physiotherapy, work-related musculoskeletal disorders (WRMDs), workplace health, occupational health, ergonomic modifications.

INTRODUCTION & REVIEW OF LITERATURE

The World Confederation for Physical Therapy has endorsed a definition of physiotherapy as a health care profession concerned with human function and movement, aiming to maximize physical potential. It focuses on identifying and enhancing quality of life and movement potential within the spheres of promotion, prevention, treatment/intervention, habilitation and rehabilitation^[1].

Physiotherapists can closely analyze body movements and postural misuse, providing them with insights to help design tools and workspaces that better support users physical well-being^[2].

Musculoskeletal problems are a leading cause of long-term pain and disability worldwide. Musculoskeletal injuries that occur at work are known as work-related musculoskeletal disorders (WRMD)^[3]. Blanca González-Sánchez et al. stated that Healthcare workers, including physiotherapists, are prone to developing WRMDs due to their daily activities, primarily affecting the shoulder, neck, and lower back. A study by J.E. Cromie and V.J. Robertson found that 91% of 824 physiotherapists were at high risk of WRMDs due to increased demand, leading to a high rate of burnout in this group^[2]. Treatments which demand repetitive movements or continuous bending, lifting/transferring dependent patients, responding to unanticipated or sudden movements by patients, performing manual therapy, restricted workplaces, understaffing, age and sex have been identified as risk factors for WRMD's in physiotherapy practice^[4].

Te-Hsin and Kleiner state Ergonomics as the study of work, focusing on balancing workplace design with employee needs and abilities^[5]. ERGONOMIC PRINCIPLES adopted are Keep Everything in Easy Reach^[6], Work at Proper Heights^[7], Reduce Excessive Forces^[8], Work in Good Posture^[9], Reduce Excessive Repetition^[10], Minimize Fatigue^[11], Minimize Direct Pressure^[12], Provide Adjustability and Change of Posture^[13], Provide Clearance and Access^[14], Maintain Comfortable Environment^[15], Enhance Clarity and Understanding^[16], Improve Work Organization^[17]. A study by Ishani Shah et al. involving 1000 physiotherapists emphasized that ergonomics is essential for preventing, eliminating, or minimizing workplace risks in occupational health and safety^[18]. Ergonomics aims to protect physiotherapist's health by optimizing their interaction with patients, therapeutic technology and the work environment^[18].

Vlad Andrei Darabont highlights the need to address ergonomic issues in physiotherapy through technical and organizational solutions, such as updating technology and optimizing workplace design. The fundamental idea of ergonomics is to ensure job demands align with workers capabilities to prevent pressures that negatively impact safety, health and productivity^[5]. Coping ergonomic strategies include position shifts and treatment surface modifications. Ergonomics Risk

Factors (ERF) can potentially harm employee's health and well-being^[7]. L. J. Fan et al. recorded 224 clinical physiotherapy cases, revealing significant ergonomic risks: 49.55% had a high risk, and 33.04% had a very high risk^[19].

Despite ergonomic knowledge and training, physiotherapists do not stretch before performing manual techniques and do not implement ergonomic principles in their professional work environment^[20]. Education, awareness-raising, and training programs on workplace musculoskeletal diseases and ways for coping with them obligate health professionals, particularly high-risk groups such as physiotherapists, to limit the development of these disorders^[21].

Need of study

India has a critical shortage of physiotherapists, with only 0.57 per 10,000 people^[22]. Prolonged exposure of physiotherapists to biomechanical stresses during their years of practice, combined with the evolution of manual therapy techniques, impact their careers^[23] and Potentially affects their performance, abilities, treatment effectiveness^[22]. To reduce musculoskeletal strains and injuries, it's crucial for physiotherapists to focus on ergonomics by learning and applying ergonomic principles^[24].

Simple measures like ergonomic workplace design, posture education, and regular exercise can help reduce musculoskeletal issues^[21]. Ergonomic training programs have led to lower injury rates, fewer modified duty days, and significant cost savings^[25]. This not only prevented injuries but also significantly increased job satisfaction among healthcare workers, potentially improving recruitment and retention^[25].

Many physiotherapists adjust their techniques to work around their physical limitations and continued to practice. However, this reactive approach is not a long-term solution^[26]. This study aims to evaluate adoption of ergonomic modifications among physiotherapists with emphasis on type of modifications as insufficient data is available on WRMD's in physiotherapist.

This highlights the need for further research to develop proactive injury prevention strategies. Addressing this knowledge gap and implementing preventing measures will better protect physiotherapists and enhance patient care^[26].

Methodology:

A descriptive cross-sectional study was conducted among physiotherapists in hospital and clinical setups over six months. The sample included 70 physiotherapists selected through simple purposive sampling from physiotherapy clinics and hospitals. The sample size was calculated using the OpenEpi Version3 calculator,

based on an anticipated population of 10,000, a 62.6% proportion of physiotherapists modifying treatment due to WRMDs (Shah et al., 2016). A validated questionnaire with 20 questions and consent forms were used. The study received approval from the institution's scientific research committee. The survey was distributed via email, staff meetings, and WhatsApp, including study details, demographic data collection forms, consent letters, and the questionnaire. Response meeting the inclusion and exclusion criteria were analyzed after data coding and tabulation.

RESULTS & DISCUSSION:

The study analyzed data from 70 participants (46 females, 24 males) using Microsoft excel. Descriptive statistics were used; continuous data were presented as Mean $\pm$ SD, and categorical data as percentages. Most participants were female, and 62.3% worked in clinical settings, while 35.7% were in hospitals. Experience levels varied: 42.9% had 5-10 years, 22.9% had 1-5 years, and 34.3% had 10-15 years of experience. Regarding work schedules, 62.9% worked six days a week, 34.3% worked seven days, and 2.9% worked 5 days. Daily hours varied from 6-8 hours (62.9%) to 9-12 hours (34.3%). The study highlighted concerns about demanding work schedules potentially impacting work-life balance and suggested the need for strategies to reduce work-related stress.

The mean values provided an overall summary of the participants' responses, highlighting trends in their ergonomic modification practices.

Regarding ergonomic modifications, the study found that:

Only 13% of participants consistently used ergonomic modifications for mechanical stress, 46% used them occasionally, and 41% did not use them at all. This low adaptation may suggest a lack of awareness or commitment, as physiotherapists often prefer conventional practices over new approaches^[27]. Ergonomic interventions were reported to be time-consuming, causing delays in implementing crucial adjustments^[28]. Physiotherapists and workers may resist new methods or prevention programs, especially if they have long-standing experience with existing practices.^[29]

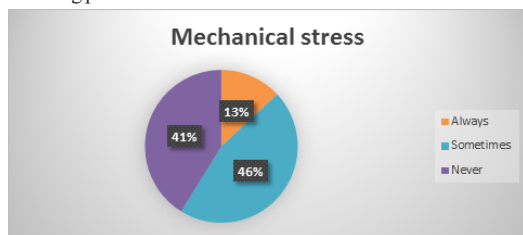


Chart I Mechanical Stress

In contrast, for ergonomic modifications related to posture: 63% of participants reported regular use, 33% used them occasionally, and only 4% did not use them, showing higher adaptation rates. Studies suggest that difficulties in maintaining certain positions lead physiotherapists to adjust their treatment approaches or patient selection, reflecting better awareness and implementation^[30].

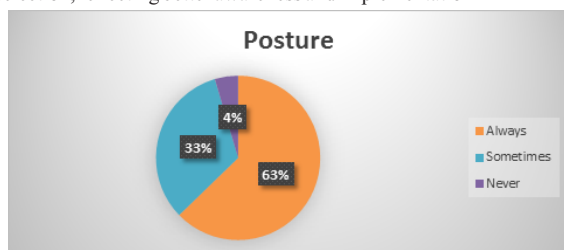


Chart II Posture

For ergonomic modifications related to workplace injury: Only 4% of participants used them regularly, 34% occasionally. A substantial 62% did not use them. Studies have shown physiotherapists often self-treat or seek help from colleagues but continue working while injured and rarely use preventive strategies. No definitive prevention mechanism for workplace injuries among physiotherapists has been established^[30]. Another study found that 67% of respondents with WRMDs did not reduce their patient-contact time, and 82% did not limit their practice areas after injury.^[31]



Chart III Workplace injury

And for ergonomic modifications related to work design/equipment: Only 44% of participants utilized them, 33% occasionally, 23% did not use them, showing moderate awareness and use.

A study found that some physiotherapists reported a lack of ergonomic education and insufficient facilities and devices, which obstructed their work.^[32]

Another study found that healthcare facilities often lack adequate resources, such as adjustable treatment tables or ergonomic tools, to support proper ergonomic practices for physiotherapists.^[33]

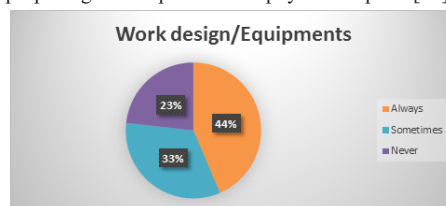


Chart IV Work design/ equipment

In conclusion, 31 % of population used work-related ergonomic modifications, indicating varied adoption and highlighting the need for improved implementation among physiotherapists.

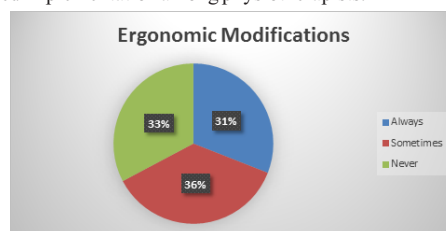


Chart V Ergonomic Modifications

Factors contributing to the non-adaptation of work-related ergonomic modifications may include- Time Limitations^[28], Lack of Awareness^[34], Financial Factors^[35], Reluctance to Embrace Change^[29], Inadequate Education and Training regarding using ergonomic tools^[36], preference for conventional practices over new approaches^[27], particularly amidst a typically busy workday.^[35], no proper Rules and Guidelines^[37], and limited access to necessary resources.^[33]

The data shows higher adoption of posture-related modifications, but less effective use of modifications for mechanical stress and workplace injury.

Employers should invest more in educating their workforce. Efforts should also be made to encourage consistent utilization rather than occasional use, as this is vital for long-term health and safety.

The findings suggest a need for workplace policies and initiatives to improve ergonomic awareness and create a culture of safety and well-being.

Further research or surveys could help identify specific reasons behind these utilization patterns and guide targeted interventions.

CONCLUSION

In conclusion, the study conducted on a sample of 70 physiotherapists revealed several key findings regarding the utilization of work-related ergonomic modifications within this profession. The study found differences in the adoption of ergonomic modifications among participants

Mechanical Stress: Only 13% utilized these modifications, with 46%

using them occasionally, and 41% not using them.

Posture: A higher percentage (63%) utilized posture-related modifications, while 33% occasionally, and only 4% did not use them.
Workplace Injury: Only 4% utilized them, 34% occasionally, and 62% did not use them.

Work Design/Equipment: Again, a relatively low percentage (44%) utilized them, while 33% occasionally, and 23% did not use them.

Overall Utilization: The final analysis indicates that 31% of the population consistently uses work-related ergonomic modifications, suggesting room for improvement in implementing ergonomic practices among physiotherapists.

These findings highlight the need for increased awareness and education regarding the importance of ergonomic modifications in the field of physiotherapy, particularly in areas related to mechanical stress and workplace injury prevention. Further research and targeted interventions may be required to enhance the adoption of ergonomic practices and promote a safer and more comfortable work environment for physiotherapists.

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