



# Ergo-HIRA: A Conceptual Model for Fitness to Work

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ABSTRACT

Musculoskeletal disorders (MSDs) in the workplace have a huge impact, emerging as a growing problem in the modern societies. Low back pain stands a major attributable fraction of global disease and injury due to various occupational risk factor, causing the most predominant cause of work-life disability. Though 1/3rd proportion of MSDs are reported as globally, still many inherent conditions might be under reported because of unavailability of rapid postural assessment tools at occupational sectors. Pre-employment and pre-placement examinations are an important tool to deal with occupational diseases as screening allows to set a well-being benchmark for new starters. Unfortunately in such screening process, postural-ergonomics assessment is not emphasized. This omission results in high incidence of MSDs in later occupational life in many workplaces. Considering above gaps Ergonomic- Hazard Identification & Risk Analysis (Ergo-HIRA) model was designed which could be included in the pre-placement health screening program to minimize future burden of Work related MSDs.

**KEYWORDS**

WMSDs, Ergonomics, Postural Assessment, Ergo-HIRA

**INTRODUCTION:**

A comparative risk assessment study by World Health Organization (WHO) indicates that the contributions of 26 risk factors to the global burden of disease; out of which 5 are related to occupational deliveries. These occupational risk factors accounted for an estimated 37% of back pain, 16% of hearing loss, 13% of chronic obstructive pulmonary disease, 11% of asthma, 9% of lung cancer, 8% of injuries, and 2% of leukemia worldwide.

Musculoskeletal conditions are a major burden on individuals, health systems, and social care systems, with indirect costs being predominant. This burden has been recognized by the United Nations and WHO, by endorsing the Bone and Joint Decade 2000–2010. Worldwide, musculoskeletal conditions are the most common causes of severe long-term pain and physical disability. The WHO estimated that about 30% of back pain worldwide was due to working conditions. In a developing country like India where data is not available or reliable, the burden due to occupational causes may be grossly underestimated. This is more so with respect to work related musculoskeletal disorders (WMSDs).

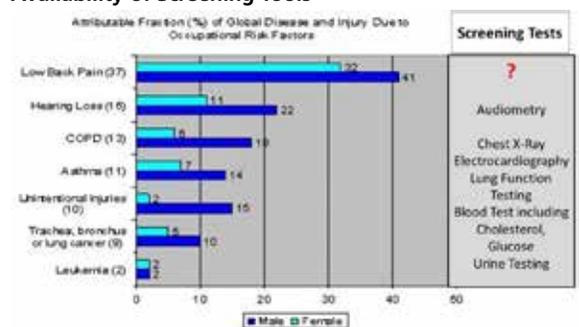
Many epidemiological studies have clearly shown that computer use and musculoskeletal disorders are common in modern society and both have shown an increasing trend. India has added 88 million Internet users during 2008-2012 and now has 137 million Internet users, recording a 26% growth year-on-year (YoY). WMSDs are an important group of occupational disorders; not only among computer users but also in almost all occupations.

WMSDs might be the most predominant cause of work-life disability in future. To recognize and prevent them is, therefore, an imperative.

**Gap Analysis: Why WMSDs Burden still rising?**

Pre-employment and pre-placement examinations are an important tool to deal with occupational diseases as screening allows to set a well-being benchmark for new starters. Unfortunately in such screening process, postural-ergonomics assessment is not emphasized, as shown in below table. This omission results in high incidence of WMSDs in later occupational life.

**Figure: Comparison of Occupational Diseases Burden and Availability of Screening Tools**



To minimize this burden several approaches like Hazard Identification & Risk Analysis (HIRA) have been used to estimate WMSDs risk from exposure to ergonomic risk factors by international agencies like WHO, OSHA, NIOSH etc. Also workstation exposure analysis through Rapid Upper Limb Assessment (RULA) or Rapid Entire Body Assessment (REBA) like readily available tools helped employer to minimize hazards in the workplace. However, these assessments do not take into account individual risk factors or susceptibility.

So, considering above gaps Ergonomic- Hazard Identification & Risk Analysis (Ergo-HIRA) model was designed which could be included in the pre-placement health screening program to minimize future burden of WMSDs.

**ERGO-HIRA: A MODEL FOR FITNESS TO WORK**

Ergonomics is the science of fitting workplace conditions and job demands to the capability of the working population. The goal of ergonomics is to reduce stress and eliminate injuries and disorders associated with the overuse of muscles, bad posture, and repeated tasks.

Ergo-HIRA is a conceptual model design, which consists of both individual (postural assessment) and work environment (ergonomics) factors. Though the office workstation analysis tools are readily available, this model focuses more on individual i.e. postural assessment part. This is a simple observational analysis of posture; both static and dynamic to screen a larger group of employees for tightness or contracture or deformity. Static postural assessment can be done in front of a postural board, which contains grid lines of specific measurement and client standing in front of it. A trained physiotherapist can

observe the client in front of postural board in three views i.e. anterior, posterior and side line view for identifying any mis-alignment of anatomical landmarks such as ear pinna, acromion process, ASIS etc. on both sides. A brief focus can be given to dynamic postural assessment which consists of basic core mobility examination i.e. one leg standing, arms up, sitting with arms up and push up. This assessment by a trained person usually takes 5-10 minutes followed by specific physical tests as per requirement.

#### **Potential Benefits of Ergo-HIRA:**

- Ascertain the prospective employer's potential musculoskeletal fitness for the job
- Identify early musculoskeletal conditions which results in decreasing physical activity
- Easy to use, secure, non-invasive technique
- Fast, efficient, low on admin costs
- Capture and retain wellbeing record, which might later help to decide whether musculoskeletal disorders are work related.
- Employers can use this, as overall fitness standard for employees

With work station assessment and static postural assessment using this technique, stiffness or contractures can be identified. Depending on the findings, stretching exercises if client has static postural abnormality and strengthening exercises if having dynamic postural abnormality could be prescribed with expert consultant.

For a physiotherapist, this opens up a new area for inclusive professional development. A sizeable number of Physiotherapists could be engaged in large scale occupational sector screening for reduction in prevalence of WMSDs.

#### **CONCLUSION:**

The sensitivity and specificity of this model could be an area of Occupational health research when it will be applied to large sectors world-wide. Fitness to work achieved thru this model can lead to better productivity and healthier occupational life. The goal of this model is to encourage the development and dissemination of educational material to address musculoskeletal disorders. Advocacy shall be required for its acceptance; perhaps thru legislation. Using this technique, it would be relatively easy to train health care workers in the health promotion, prevention & treatment of WMSDs.

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