

## **Ergonomic evaluation of physiological stress of the building construction workers associated with manual material handling tasks**

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**A-** Conception and study design; **B** - Collection of data; **C** - Data analysis; **D** - Writing the paper; **E**- Review article; **F** - Approval of the final version of the article

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### **ABSTRACT**

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**Purpose:** In India, cost of manpower is very low; hence Manual Material Handling (MMH) is the cheapest solution. This study aimed to quantify the cardiac strain and postural stress of the male building construction workers associated with MMH tasks.

**Materials and methods:** Mean (SD) of age (years) and job experience (years) of the workers were 31.0(4.65) and 8.8 (3.23) respectively (n=35). Working peak heart rate was recorded by polar heart rate monitor, posture analysis was done by Ovako Working Posture Analysis System (OWAS) and Rapid Entire Body Assessment (REBA) method, body part discomfort was assessed by Nordic questionnaire and perceived exertion was evaluated by Borg's scale. Two tailed unpaired Student's t test was performed between peak heart rate of workers associated with MMH tasks and upper extremity intensive tasks (n=31).

**Results:** Results revealed that mean peak heart rate of the workers was significantly different (higher) compared to that of the upper extremity intensive workers ( $p<0.05$ ). This study showed that most of the working postures were hazardous. Magnitude of risk for MSD was much higher as per REBA compared to OWAS. Most of the workers suffered from pain in head, neck, shoulder, lower back and arm region. As per the Borg scale rate of perceived exertion was 'hard and heavy' among most of the workers (68.57%).

**Conclusions:** Postural stress and cardiac strain beyond the safe limit indicates the heavy nature of the job. Load limit optimization, ergonomic lifting technique, rescheduled work rest cycle are essential to reduce physiological and perceived work load.

**Key words:** Construction industry, Manual Material Handling, posture, peak heart rate.

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